IQ Nexus Journal

Vol. XIII, No. 1/ March 2021

http://iqnexus.org/

Featuring:

Louis Sauter
David Udbjorg
Mira Cervenka
Vernon M. Neppe
Edward R. Close

Satelites or Sentinels for operational needs of the new ESA developement called Copernicus programme

Inside

7 Fine Arts *music, poems, visual, gallery*
Science & Philosophy *papers, essays, dialogues, reviews*
Puzzles, Riddles & Brainteasers *sudoku, matrices, verbals*
IQNJ Calendar

Online Journal of IIS, ePiq & Isi-s Societies, members of WIN

IQ Nexus Journal editorial staff

Publisher/Graphics Editor... .....Stanislav Riha

English Editor.....Jacqueline Slade

Web Administrator & IQ Nexus founder.....Owen Cosby

Contact us at infinimag@gmail.com

Website; https://iqnexus.org/

Non-members' contributions are welcome and every contribution has to be accompanied by an introduction from the contributor.

IQ Nexus Journal

was created to publish creative endeavours for members of the IIS, ePiqs and Isi-s web based societies as well as guests of other societies and invited non members..

This issue features creative works of:

Listed alphabetically;

Albert Camus
Alena Plíštilová
David Kelly
David Udbjorg
Edward R. Close
Jason Munn
Jaromír M Červenka
Louis Sauter
Marilyn Grimble
Mark van Vuuren
Stanislav Riha
Thomas Hally
T.G. "Torg" Hadley
Vernon M. Neppe
Xavier Jouve

COVER PAGE

Image used from ESA website.

https://www.esa.int/Applications/Observing_the_Earth/Copernicus

ESA is developing a new family of missions called Sentinels specifically for the operational needs of the Copernicus programme.

Each Sentinel mission is based on a constellation of two satellites to fulfil revisit and coverage requirements, providing robust datasets for Copernicus Services.

These missions carry a range of technologies, such as radar and multi-spectral imaging instruments for land, ocean and atmospheric monitoring:

Special thanks to **Jacqueline Slade** *for her great help with English editorial work and* **Owen Cosby** *For reviving and restoring Infinity International Society and establishing IQ Nexus joined forum of IIS and ePiq and later ISI-S Societies for which this Journal was created..*

"Even though scientist are involved in this Journal, I and all involved in the IQ Nexus Journal have tried to keep the content (even though it is a Hi IQ Society periodical) on an ordinary human level as much as possible. In fact, is it not the case, that - to be a human being is the most intelligent way of life?"

Stanislav Riha

Contents

Fine Arts

architecture, poetry, music, paint, print, photography, writing.

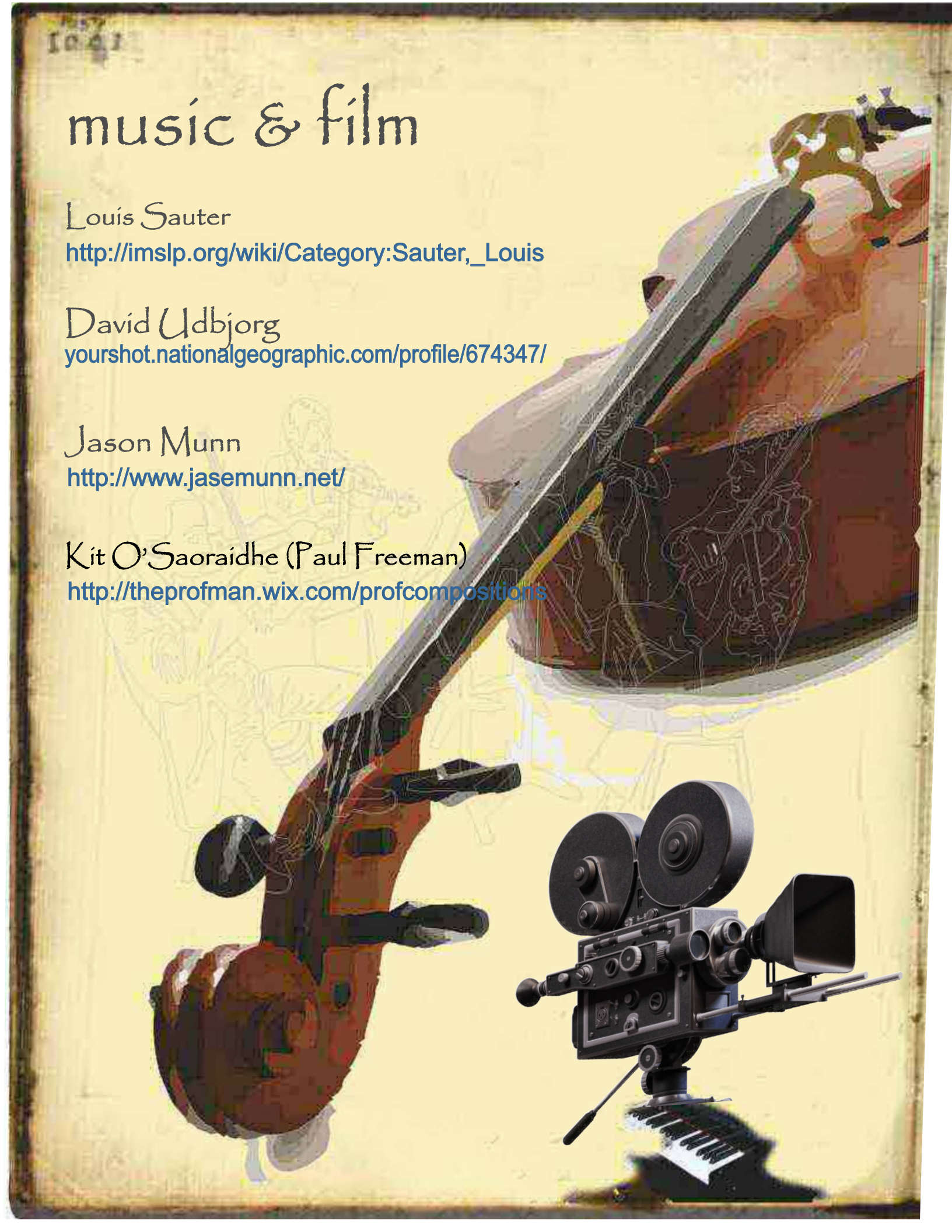
music & film

Louis Sauter
http://imslp.org/wiki/Category:Sauter,_Louis

David Udbjorg
yourshot.nationalgeographic.com/profile/674347/

Jason Munn
http://www.jasemunn.net/

Kit O'Saoraidhe (Paul Freeman)
http://theprofman.wix.com/profcompositions



Variations sur l'air provençal 'Digo Janeto'

This is a set of variations for piano on the Provençal song Digo Janeto. Note that the tune is identical to that of the song Pastre, Pastressa used in the first movement of my Fantaisie Niçoise for flute and guitar, and some of the variations are similar; but there are several new ones that are very pianistic!

The piece was premiered on the 24th of August 2020 at the Blüthner Piano Centre in London by a wonderful pianist, Maria Marchant, as part of her 7 Notes in 7 Days project.

The premier was streamed live on Facebook and is available on YouTube at https://youtu.be/Hcf-8oRO6yQ

There is also a video of the composer (!) presenting his piece here: https://youtu.be/YcDTzgMqapo

by Louis Sauter

Louis Sauter

Variations sur l'air provençal "Digo Janeto"

pour piano

(2019)

Pour Ludmila Zaitseva et Svetlana Kazykina

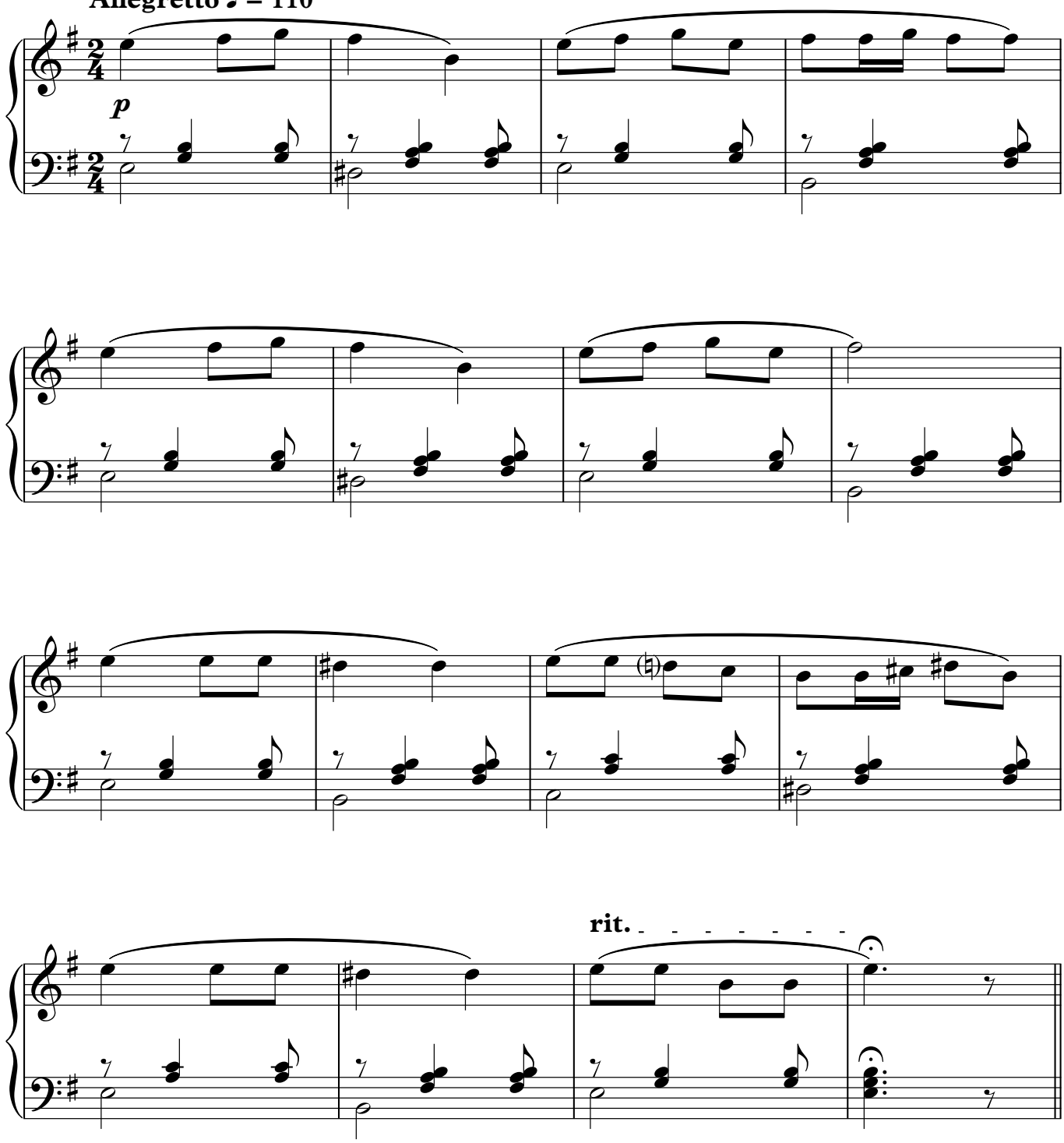
Variations sur l'air provençal “Digo Janeto”

pour piano

Louis Sauter

TEMA

Allegretto ♩ = 110



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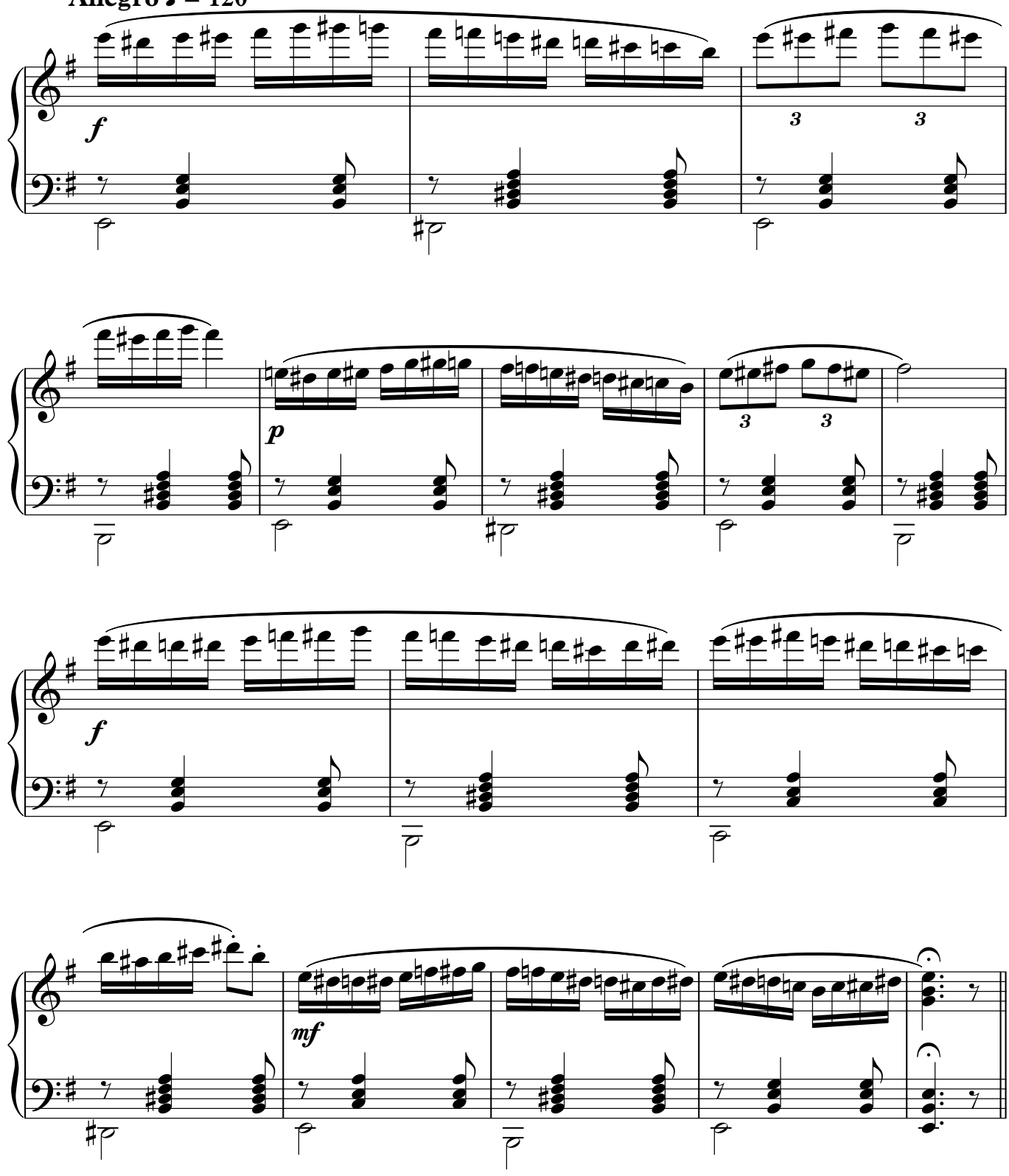
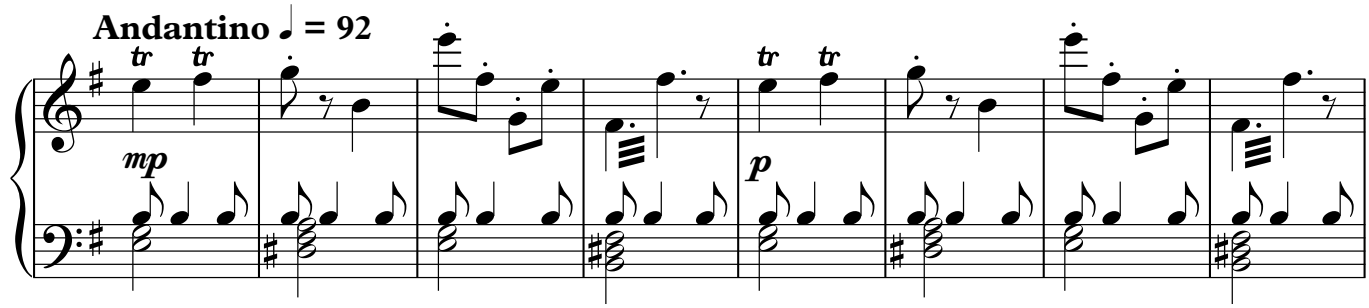
VAR. I.

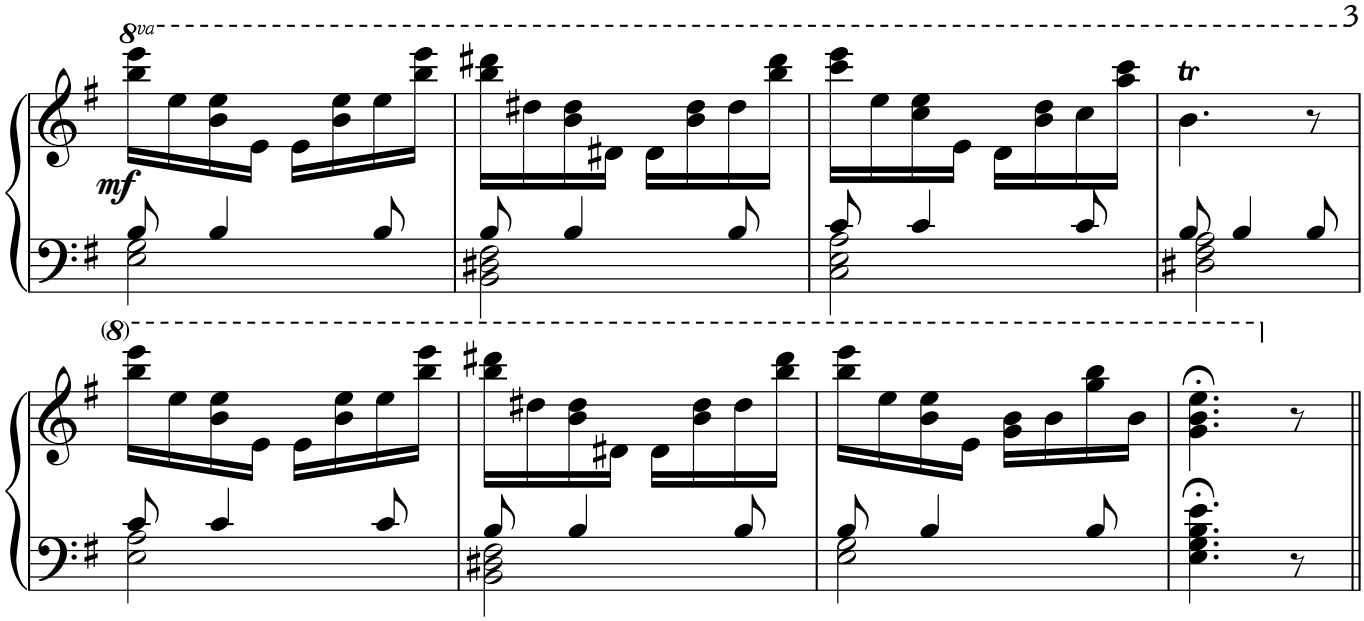
Allegro ♩ = 120



VAR. II.

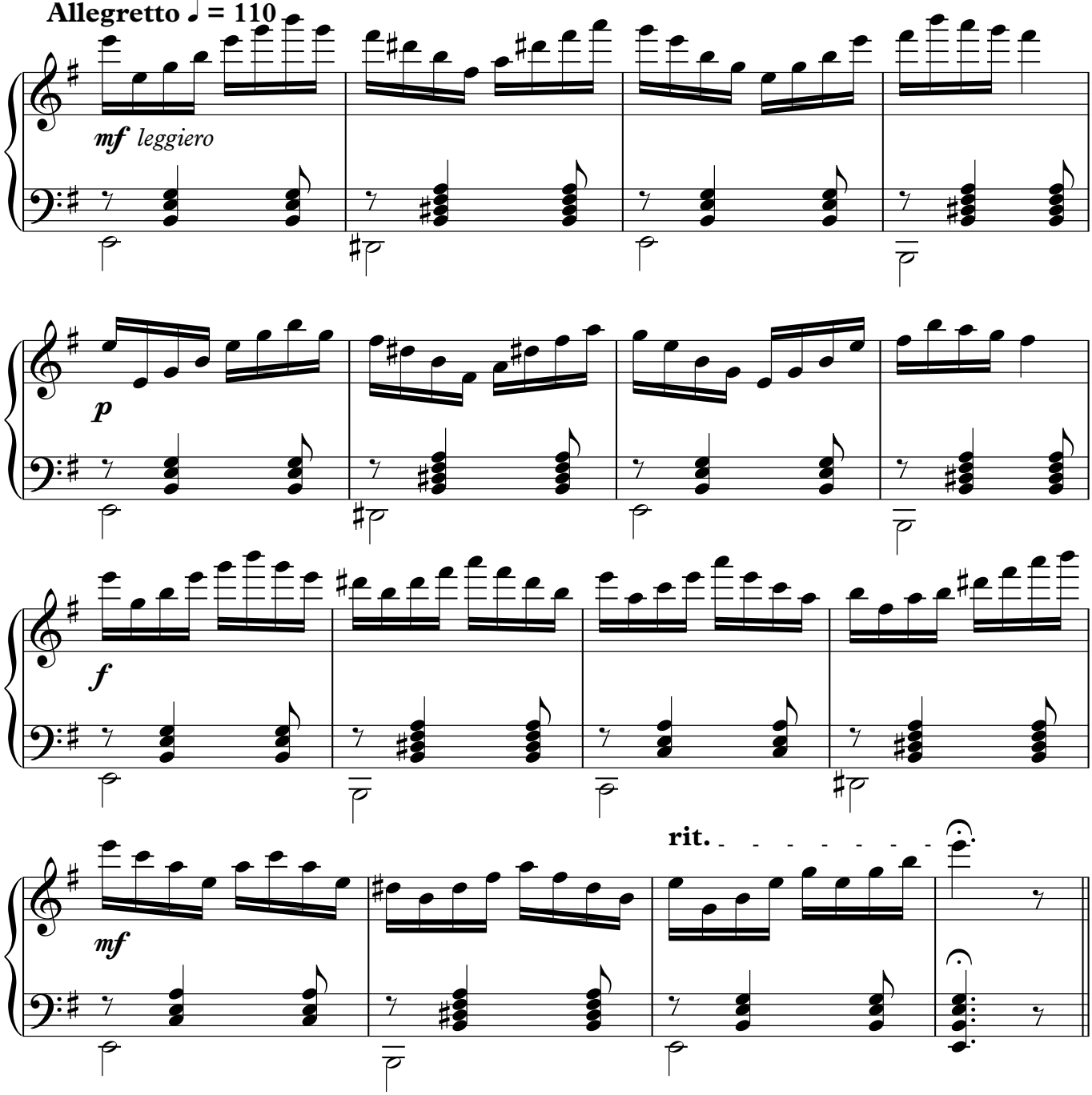
Andantino ♩ = 92





VAR. III.

Allegretto ♩ = 110



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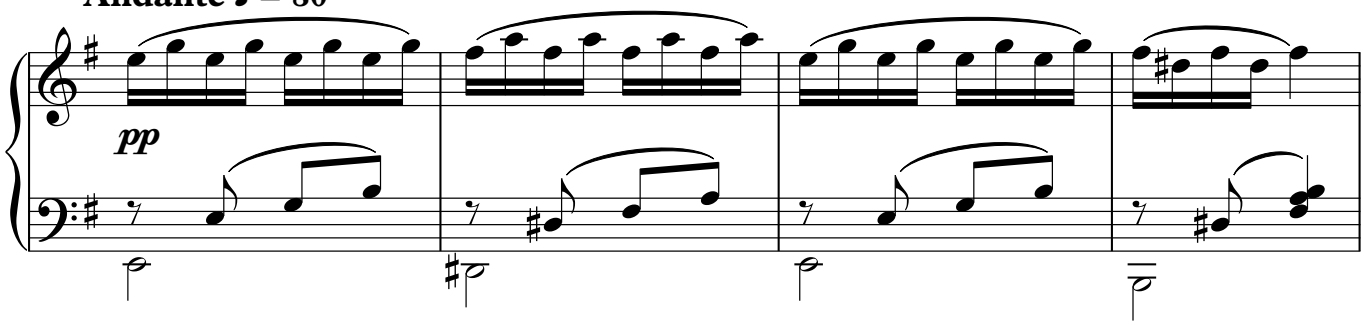
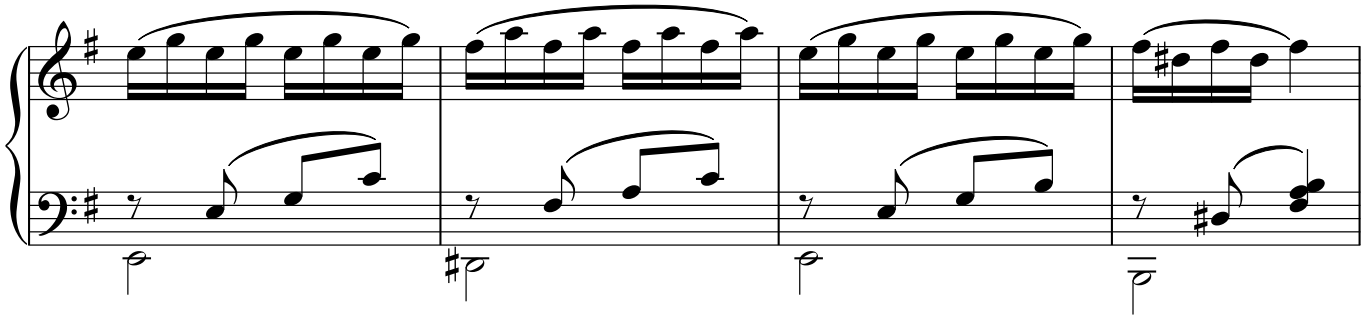
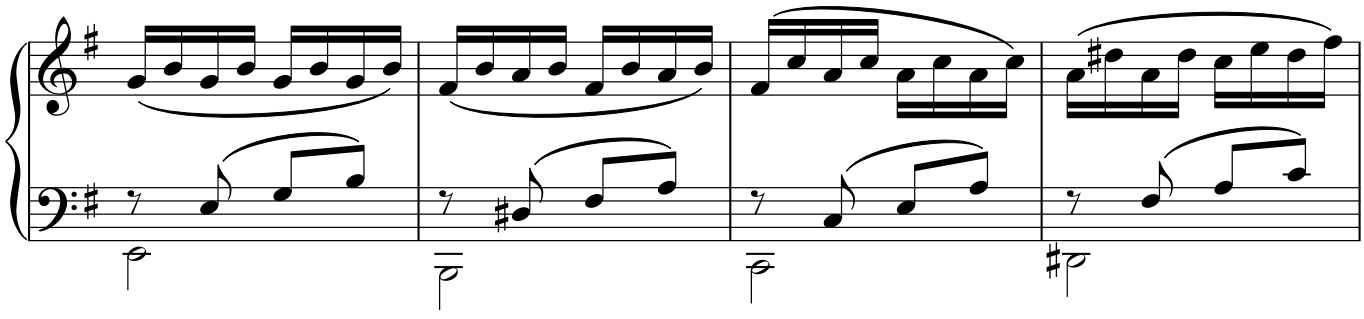
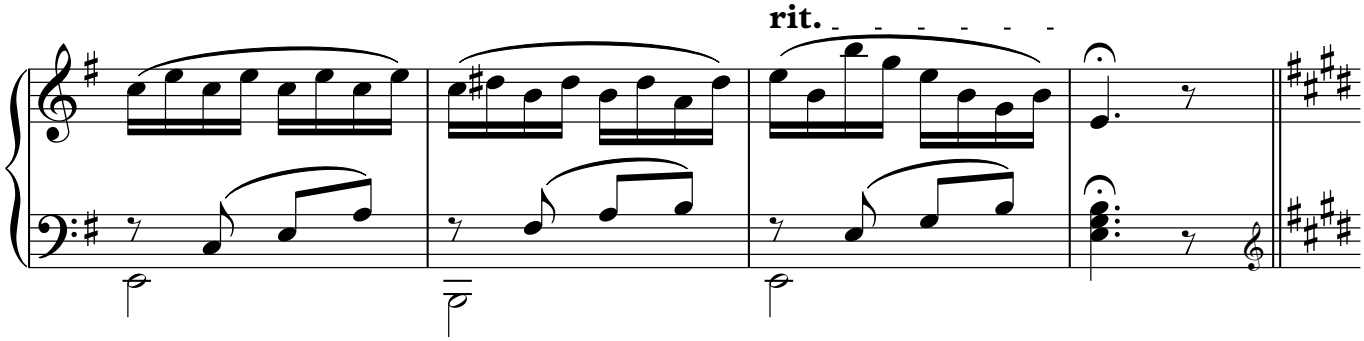
VAR. IV.

Andante ♩ = 80



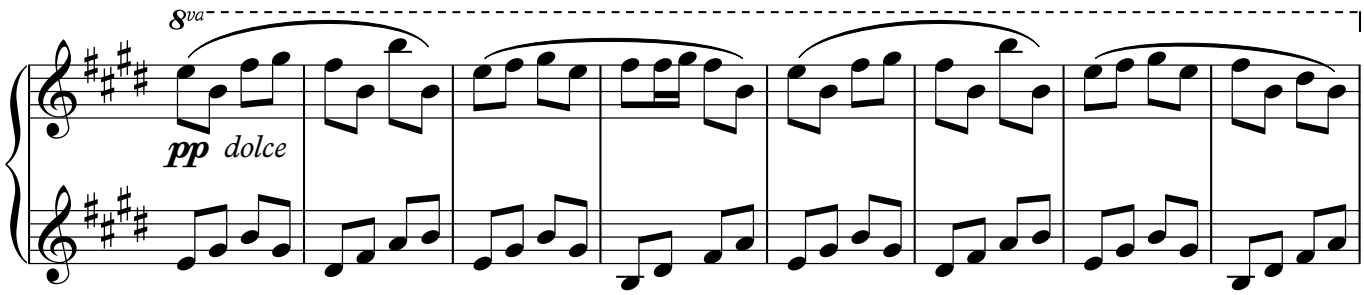


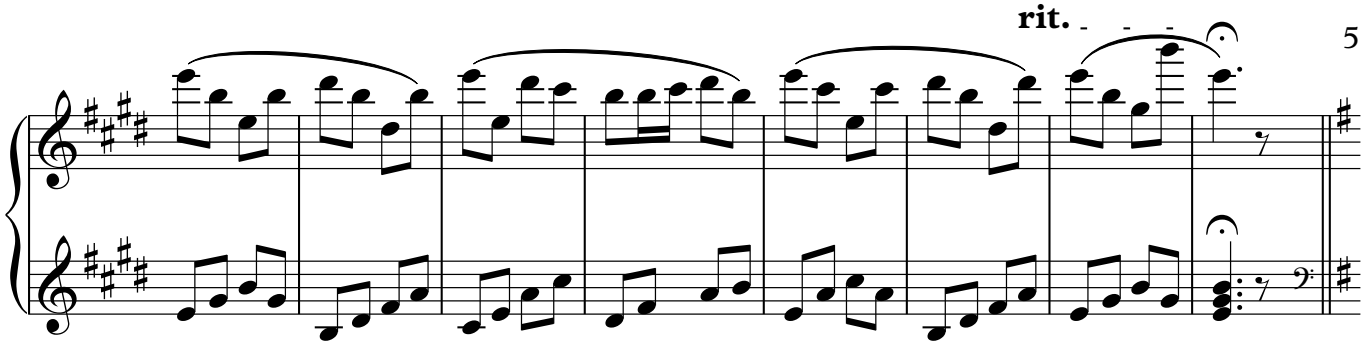




VAR. V.

Andantino ♩=92





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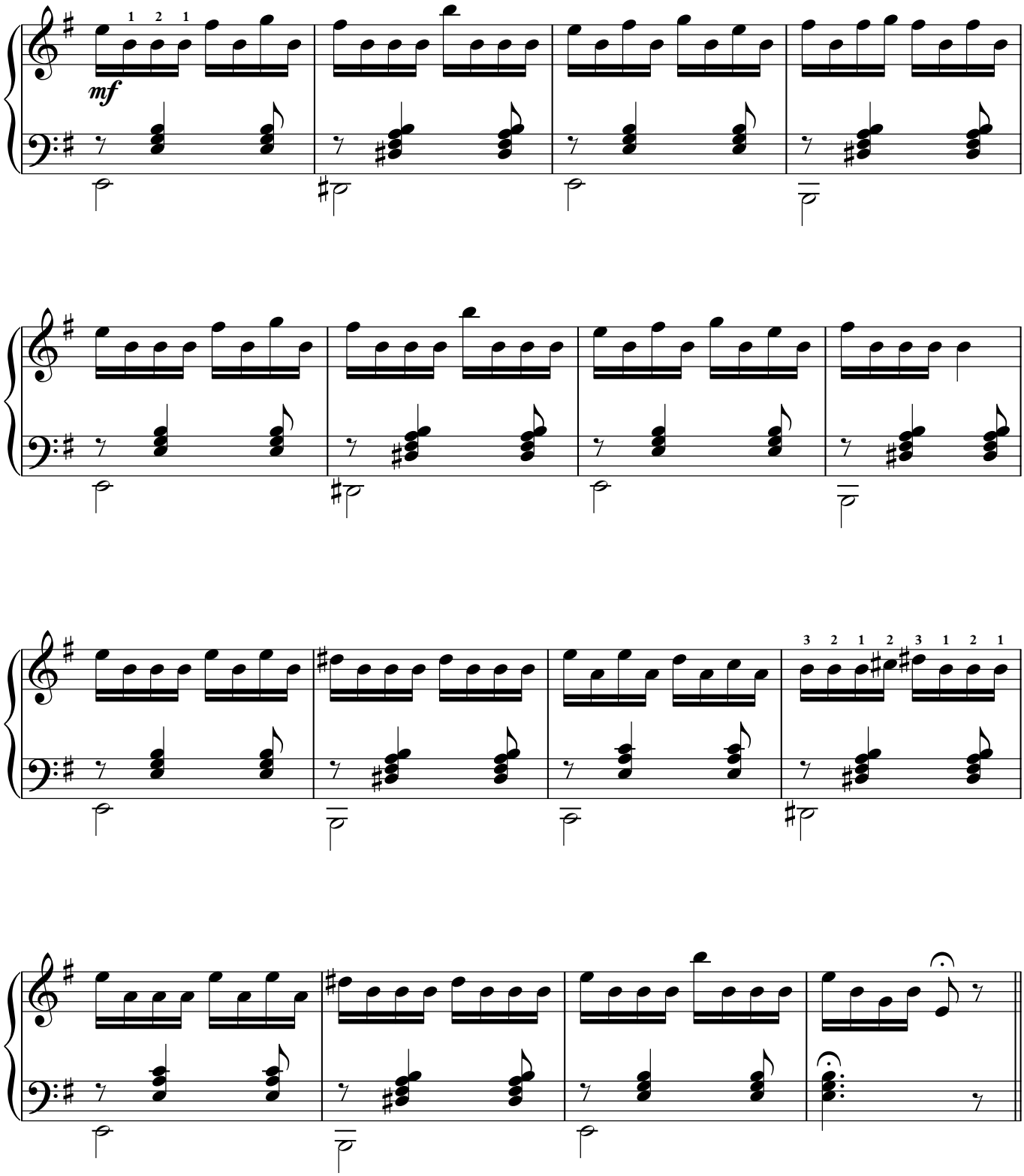
Andantino ♩ = 92



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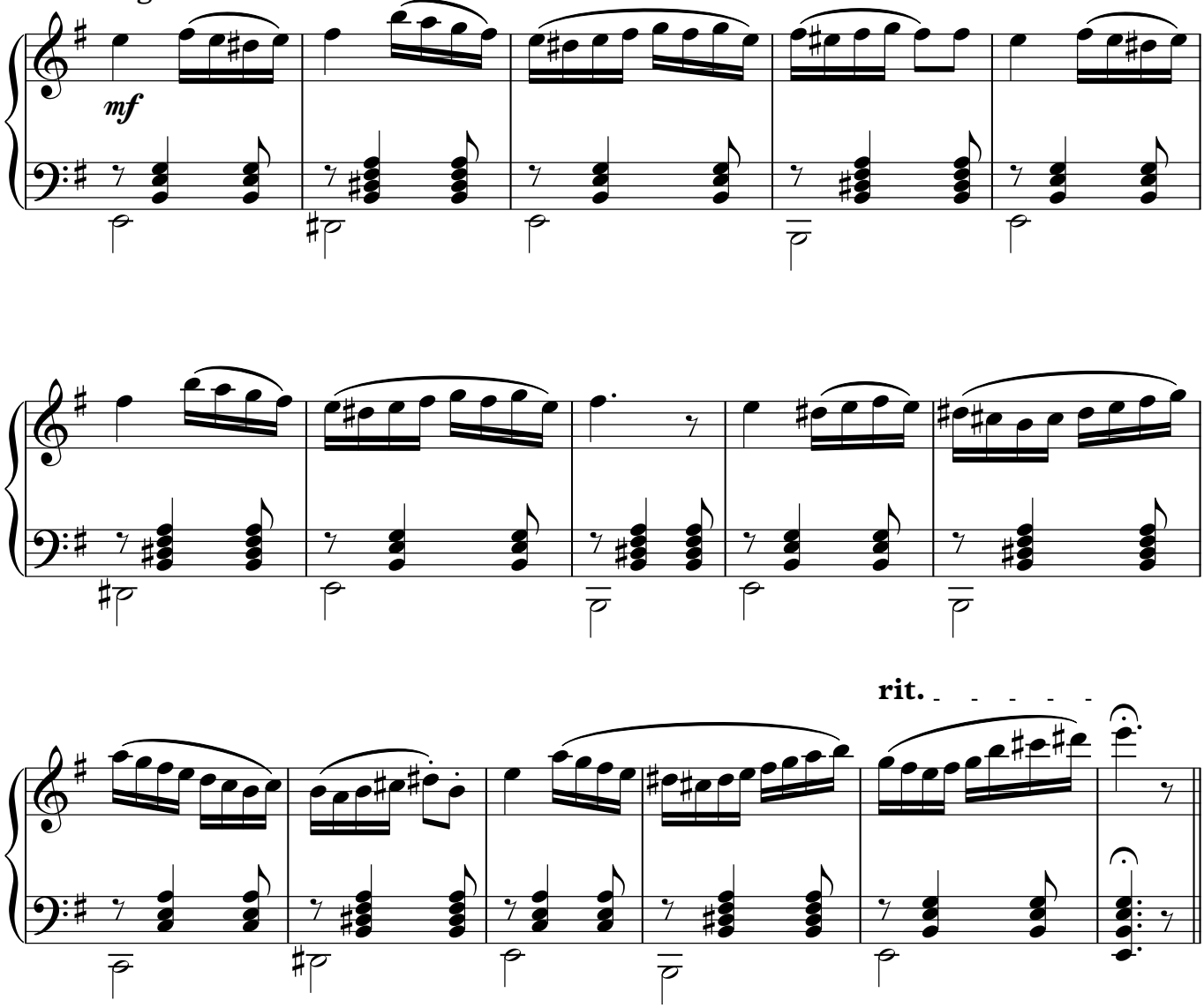
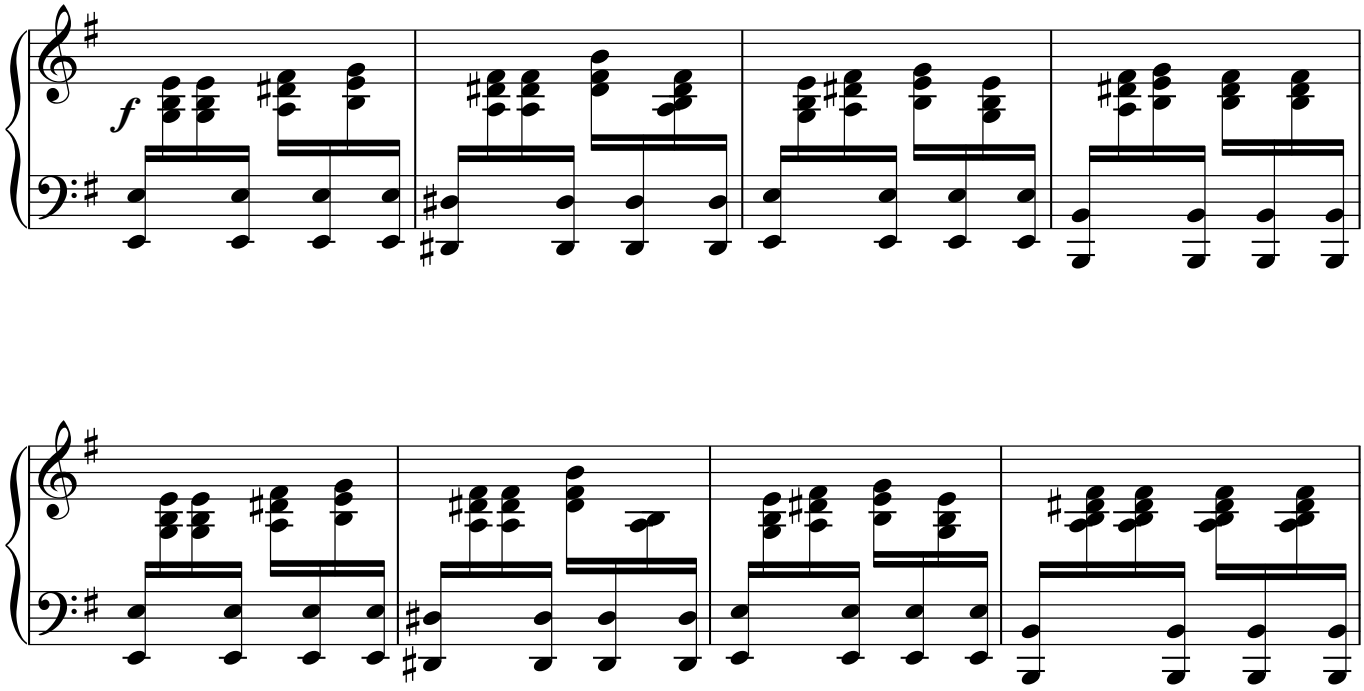
VAR. VII.

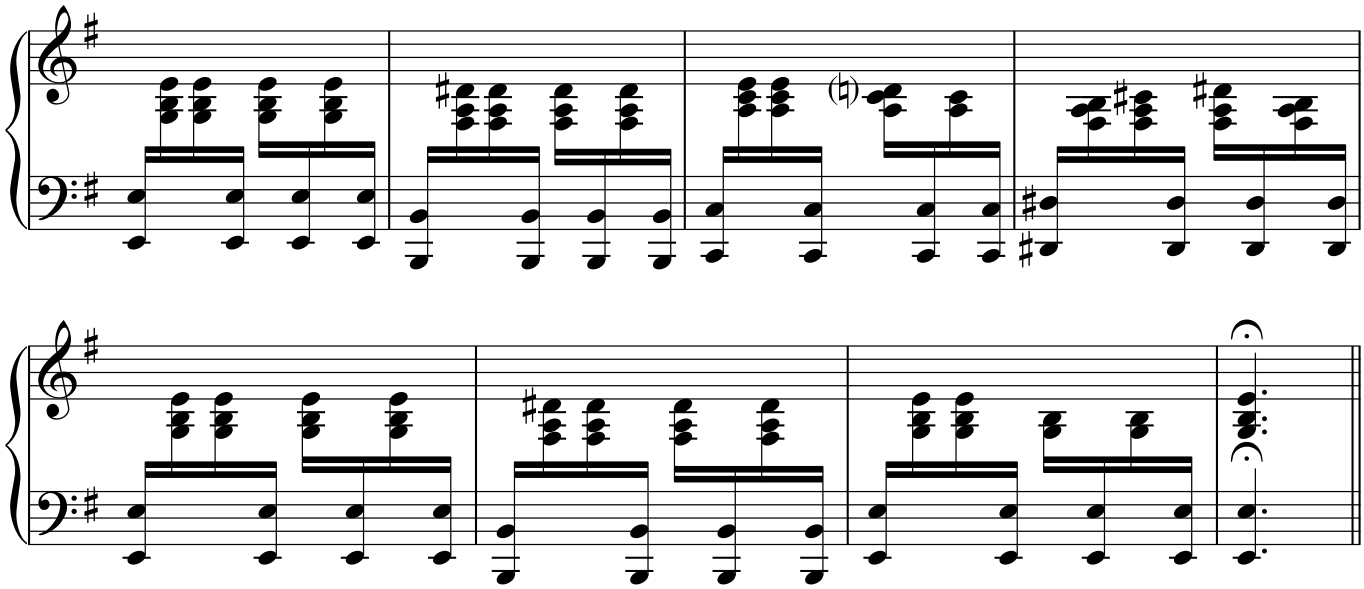
Allegretto ♩ = 110



VAR. VIII.

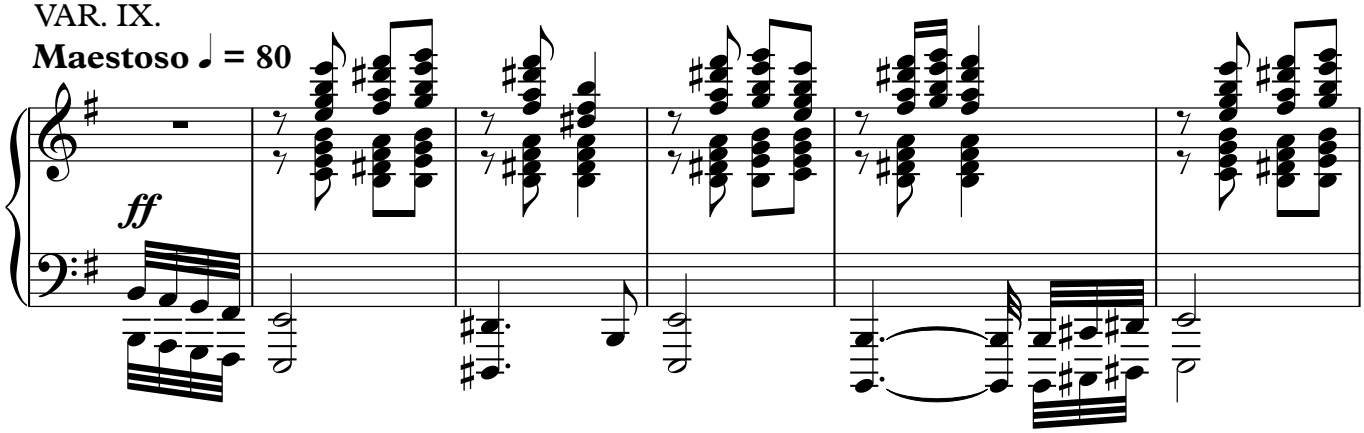
Allegro con fuoco ♩ = 120

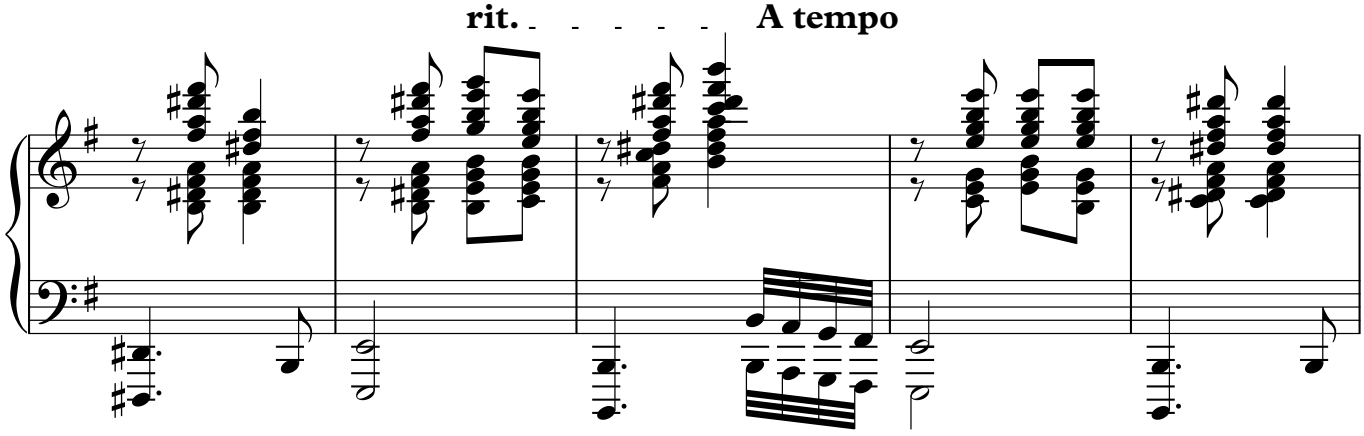


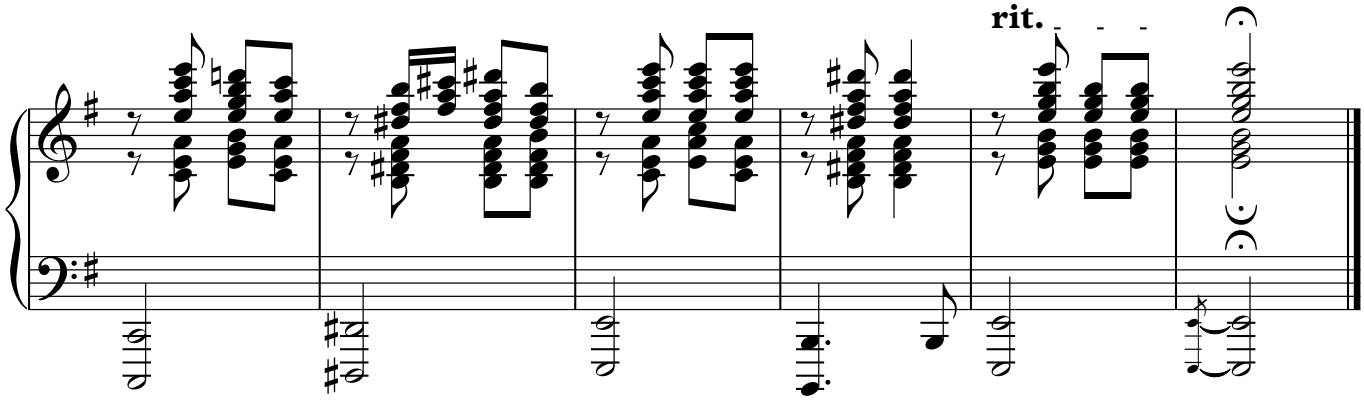


VAR. IX.

Maestoso ♩ = 80







DAVID UDBJORG

RINGSTED, ZEALAND, DENMARK

VIDEO

yourshot.nationalgeographic.com/profile/674347/

Life in Dhaka - Bangladesh

https://www.youtube.com/watch?v=pgg6yQybYjE

Video and Musical Composition by Jason Munn

https://vimeo.com/450759085

Grove 2

The Glowing Orb Of Dark Theorem

https://soundcloud.com/jase-munn/the-glowing-orb-of-dark-theorem

POETRY

by

Lao-Tzu 500bce

Thomas Hadley

Late T. G. "Tong" Hadley

Wisdom of ancient Master

Tao Te Ching

Lao-Tzu 500bce

The Tao gives birth to One.
One gives birth to Two.
Two gives birth to Three.
Three gives birth to all things.

All things have their backs to the female
And stand facing the male.
When male and female combine,
All things achieve harmony.

Ordinary men have solitude.
But the Master makes use of it,
Embracing his aloneness, realizing
He is one with the whole universe.

no. 41

Albert's Blue Imperium

Thomas Hally

In that long right turn I take in my
Model-T I see a little boy seven
or eight years of age
looking intensely into

The Blue Imperium,
A hopeful thought so close to the hem
of Heaven.

Dark renders mute the night so
Blues fast dancers' legs left legs right
Sobbing she sees her quickly diming darkness,

Conquered by light, running away like
a scaredy cat bumping into beautiful days
with no dark clouds to oppress, depress
or possess. His was beyond sky, beyond
stars, beyond Heaven itself.

I asked him gently, "Where are your friends?"
"My friends died a very long time ago."
"Oh, I am very sorry. So, is that why you
are looking so intensely into the sky?"
"No sir." He replied. "I'm looking
for Eternity." I chuckled silently and said
to the boy "But why? You won't find eternity
by peeking up into the sky--not even Einstein could!"

I asked the grinning youngster, whose eyes showed
an unusual curiosity "What is your name young man?"
"Albert Einstein, sir." And again, he looked up into
The now black starlit dome above us and we both
Saw a twinkle in the sky at the same instant
He winked at star and said to me, "It's worth a try.!"

Kwan Tam's Koan

You're wiser with a quiet brain; your mind
Should be your Consciousness: the Beta Wave
Brain frequency's best use, (I'm sure you'll find),
Is as a tool. Your Soul, it cannot save.

Release your fears, desires, attachment to
Your expectations; 'things' cannot bring joy.
We meditate, we pray, then we break through
To Alpha Wave Cognition. We employ

Our Higher Selves in concentrating on
Our demonstration of unselfish love.
The temporal, we can't depend upon.
Don't 'settle'. Wake up! Strive to rise above

Enchantments, suave Illusion's sticky trap.
Some say we're 'thinking meat'? A load o' crap!

e-Chiado.pt

CENTRO NACIONAL DE CULTURA

Schedule

Exhibitions

10 to 16 Feb 2021

Online

Downtown Chiado International Exhibition virtually recreated

Scheduled to open on February 6, the international exhibition Downtown Chiado is now virtually recreated, so that the public can contemplate the works through a virtual visit.

>> Link to access the Exhibition

The artists selected for this show are:
Atuska | Sunday Stop | Filipe Assunção | Kayo Sato | Leonor Trindade Sousa | Lita Oliveira | Manuel Casa Branca | Natália Gromicho | Paulo Saraiva | Sarka Darton | Silvia Azevedo | Sinikka Elfving | Stanislav Riha | Yvonne Wiese

Atuska comes from Hungary, is an artist who presents a very uniform work, always in an environment of abstraction, using the contrast of the gold leaf, with the black and gray tones, very characteristic of its origins.

From Bolivia we can glimpse the graphics created by **Domingo Parada.**

Filipe Assunção is undoubtedly an artist with worldwide recognition, he presents us with a surrealist work with an explosion of intense color.

From Japan, **Kayo Sato** presents the most irreverent work, using the pleat technique, creates a fabric installation with 3 very original works. For the first time at ANG,

Leonor Trindade Sousa offers us a set of absolutely impressive works, with emphasis on the fusion between the figurative and the abstract, very well achieved by the Portuguese artist.
Also for the first time in Chiado, **Lita Oliveira** "recreated" humanity in a very balanced work that will not leave visitors indifferent.

Manuel Casa Branca is a very complete artist who shows us a landscape work with reference to his roots, the Alentejo.

Natália Gromicho presents an unpublished work, an acrylic named "Poloroid" painted in 2020 with a new language, distinct from the works she has presented to us.

Paulo Saraiva is a Portuguese artist, residing in Paris. With a unique talent, he presents a collection created for this show, with a surrealist touch that has already accustomed us throughout his career.

Sarka Darton , an artist from the Czech Republic who currently lives in London, presents us with an installation, with a fusion of wood-based painting, stone sculpture and some surprises to discover on the spot.

Sílvia Azevedo represents Brazil, is a talented artist who shows us, for the first time, her magic in Portugal.

Sinikka Elving is a talent from Finland, she is also an award-winning artist exhibiting a very particular abstract work where the yellows and lilacs merge making it a very original harmony.

Stanislav Riha is already a consolidated artist in Lisbon, was born in the Czech Republic but lives in Canada, presents in this edition a collection of 3 unpublished surrealist works, with insertion of gold leaf, glues, resins and various noble materials.

Yvone Wiese was born and lives in Denmark, an artist with impressionist influences and at the same time a sense of depth in the work that brings to Lisbon.

The exhibition was postponed to April, and will be on digital display from February 10th to 16th at Atelier Natália Gromicho do Chiado, from 11 am to 5 pm.

About ANG (Atelier Natalia Gromicho)

Atelier Natália Gromicho is located in Espaço Chiado, a shopping center in the middle of Chiado that was built preserving the Fernandina Wall from the Middle Ages. Its location is privileged, with access from Rua da Misericórdia and Rua Nova da Trindade, right next to the Teatro da Trindade.
The space known as the merger of an Atelier and an art gallery, has about 100 square meters, has a very diverse program annually, highlighting live painting, international contemporary art exhibitions, a prize giving gala and monthly a exhibition of works by the resident artist. Atelier Natália Gromicho has already exhibited more than 170 artists, from 29 nationalities
Natália Gromicho is the mentor of the entire project, an artist with 25 years of career, has more than 150 exhibitions all over the world, the artist has been promoting an innovative concept in her city for more than 5 years, where she applies all international experience in this concept.
Open Tuesday to Saturday from 2pm to 6pm

SC of A

Xavier Jouve
photograph

Alena Plistilova

photograph

Alena Plistilova

photograph

Mark van Vuuren

photograph

Albert Camus

photograph

Marilyn Grimble

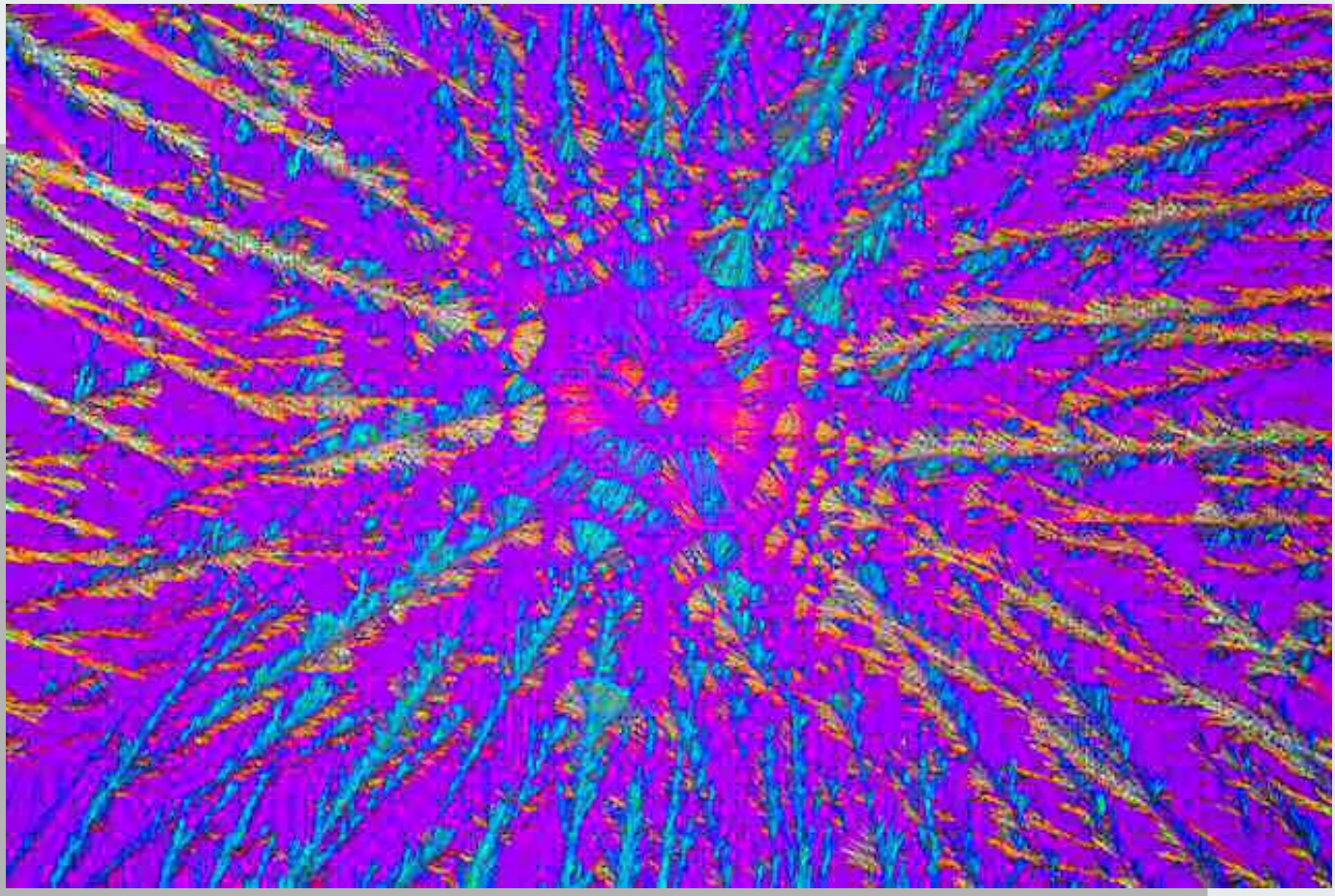
watercolour

Marilyn Grimble
photograph

Art from the past

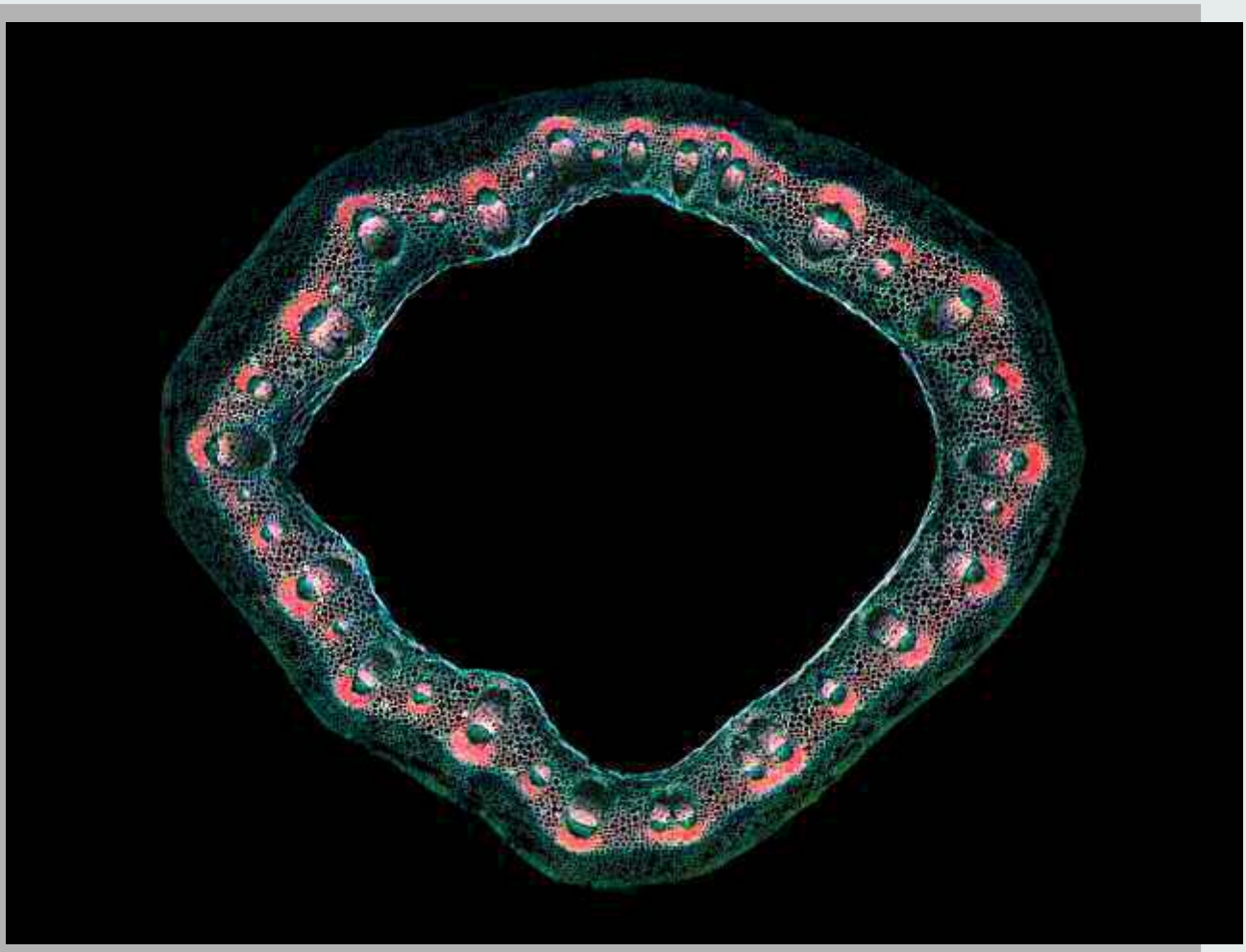
Rafael "Madonna in the meadows"


SHERLOCK



David Kelly

Glut image 6



David Kelly

Trollius section

Science, Philosophy, Essays & Reviews

Overview of Sentinels missions.

S Riha

Ancient Pay Slip Shows That This Roman Soldier Slaughtered for Nothing

By Ashley Cowie and S Riha

Understanding reality: Towards a unified theory of existence via applied Dimensional Biopsychophysics: exploring the TDVP through demonstrating fundamental principles, the 4D-9D perspective, the mathematics of quantum calculus and the empiricism of gimmel.

By Vernon M. Neppe and Edward R. Close

Overview of Sentinels missions.

https://www.esa.int/Applications/Observing_the_Earth/Copernicus

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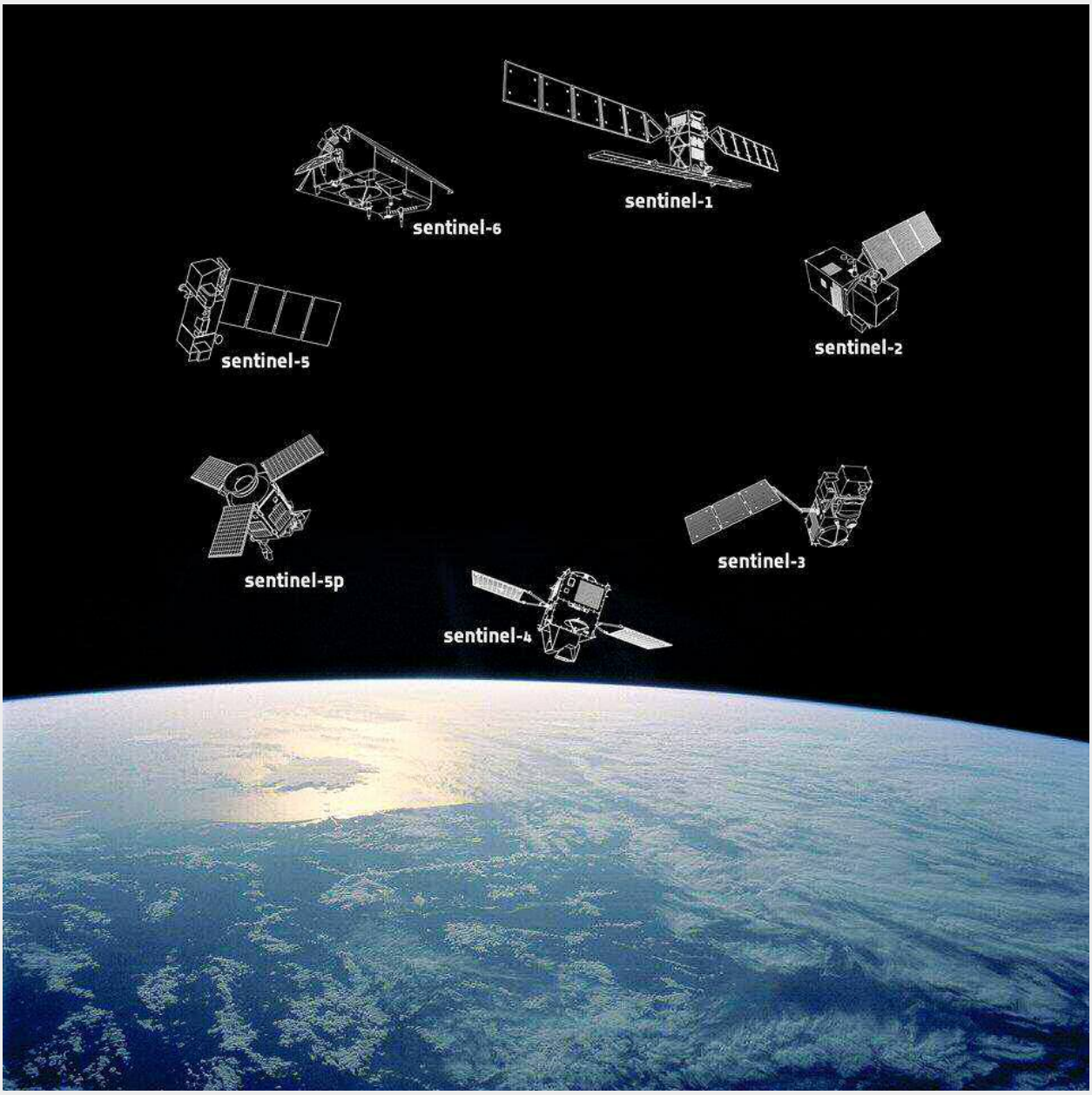
These missions carry a range of technologies, such as radar and multi-spectral imaging instruments for land, ocean and atmospheric monitoring:

Sentinel-1 is a polar-orbiting, all-weather, day-and-night radar imaging mission for land and ocean services. Sentinel-1A was launched on 3 April 2014 and Sentinel-1B on 25 April 2016. Both were taken into orbit on a Soyuz rocket from Europe's Spaceport in French Guiana.

Sentinel-2 is a polar-orbiting, multispectral high-resolution imaging mission for land monitoring to provide, for example, imagery of vegetation, soil and water cover, inland waterways and coastal areas. Sentinel-2 can also deliver information for emergency services. Sentinel-2A was launched on 23 June 2015 and Sentinel-2B followed on 7 March 2017.



Sentinel family

Sentinel-3 is a multi-instrument mission to measure sea-surface topography, sea- and land-surface temperature, ocean colour and land colour with high-end accuracy and reliability. The mission will support ocean forecasting systems, as well as environmental and climate monitoring. Sentinel-3A was launched on 16 February 2016 and Sentinel-3B will join its twin in orbit on 25 April 2018.

Sentinel-5 Precursor – also known as Sentinel-5P – is the forerunner of Sentinel-5 to provide timely data on a multitude of trace gases and aerosols affecting air quality and climate. It has been developed to reduce data gaps between the Envisat satellite – in particular the Sciamachy instrument – and the launch of Sentinel-5. Sentinel-5P was taken into orbit on a Rockot launcher from the Plesetsk Cosmodrome in northern Russia on 13 October 2017.

Sentinel-4 is a payload devoted to atmospheric monitoring that will be embarked upon a Meteosat Third Generation-Sounder (MTG-S) satellite in geostationary orbit.

Sentinel-5 is a payload that will monitor the atmosphere from polar orbit aboard a MetOp Second Generation satellite.

Sentinel-6 carries a radar altimeter to measure global sea-surface height, primarily for operational oceanography and for climate studies.

Looking to the future, six high-priority candidate missions are being studied to address EU policy and gaps in Copernicus user needs, and to expand the current capabilities of the Copernicus space component.

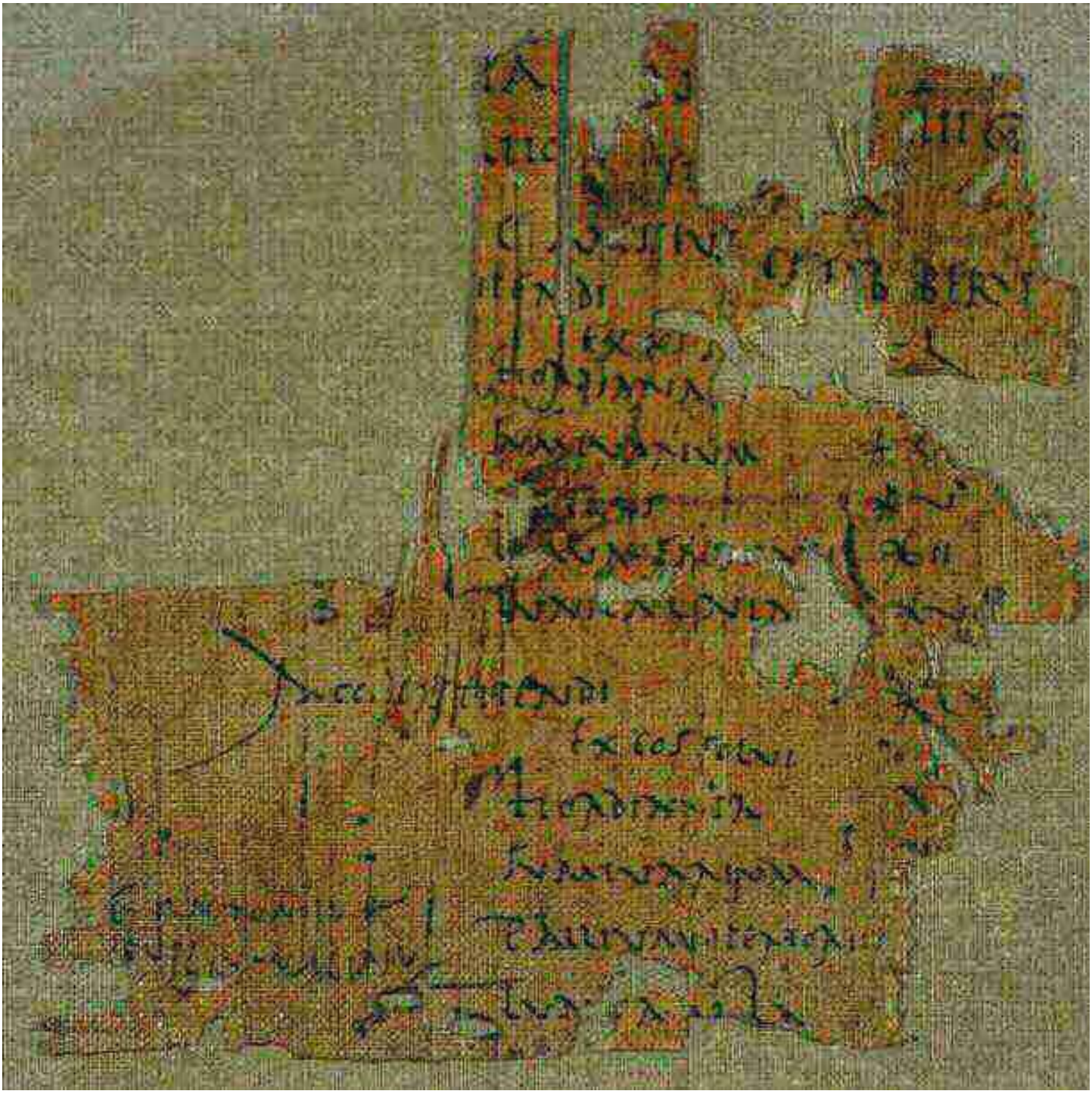
Ancient Pay Slip Shows That This Roman Soldier Slaughtered for Nothing

UPDATED 10 FEBRUARY, 2021 - 14:00 ASHLEY COWIE

An ancient pay slip details how a Roman soldier had partaken in a battle that ended up with the mass suicide of hundreds of innocent Jews. But what is the interesting fact that comes out of this piece of ancient evidence, is the fact that, after deductions, the warrior had literally worked for nothing. Zilch.
Archaeologist Joanne Ball first publicized the 1,900-year-old Roman auxiliary soldier's papyrus pay slip in a Twitter post in March 2019. Ball said the soldier, Gaius Messius, was an Imperial grunt who participated in the Siege of Masada: the last battle of the First Jewish-Roman War, also known as The Great Revolt. Messius had earned a total of 50 denarii for his services to the Roman Empire. However, this legionary cavalryman fed his horse and mule and when deductions for barley, food and military equipment were calculated, he ended up with nothing.

The Jewish Families Who Chose Death Over Enslavement

James Clark wrote an article about the papyrus in the March of 2019 edition of the military magazine Task & Purpose. The writer reported that the translation of the ancient pay slip is available to the public on the Database of Military Inscriptions and Papyri of Early Roman Palestine. During the First Jewish-Roman War, which took place from 66 to 73 AD, Gaius Messius fought in the Siege of Masada. This ancient settlement is located 12 miles (19.31 km) east of Arad, in the Southern District of Israel overlooking the Dead Sea. It was heavily fortified by Herod the Great between 37 and 31 BC and Israeli archaeologist Yigael Yadin first excavated the site between 1963 and 1965.



Papyrus pay slip for Gaius Messius shows that this soldier ended up with nothing after putting his life on the line. (Dr Jo Ball / Army of Roman Palestine)

According to the History Channel, after Jerusalem was destroyed in 70 AD, fleeing rebels relocated to Herod's fortress in Masada. Over the preceding weeks, an army of 8,000 Roman soldiers, including Gaius Messius, completely surrounded the base of the mountain on which Masada is perched. The Great Revolt ended with destruction of Jewish towns, the slaughter and displacement of people and the appropriation of land for Roman Military use. At Masada, when the Roman soldiers eventually stormed the fortress, 960 Jewish rebels and their families who were sheltering in the ancient city committed an act of mass suicide rather than becoming Roman slaves.

The desert fortress of Masada, the location of the Siege of Masada where the Roman soldier Gaius Messius fought, as seen for the air. (Andrew Shiva / CC BY-SA 3.0)

The Worst Kind of Blood Money: Lots of Blood, But No Money

While the Roman soldier's pay slip provides an interesting insight into the life of a Roman soldier at the time of the Siege of Masada, it is harrowing to think that this man had waded amidst the corpses of hundreds of Jewish families, for nothing. Not a bean. The very opposite was the case with the oldest pay slip ever discovered in Mesopotamia, in the city of Uruk (in modern-day Iraq). A 5,000-year-old cuneiform tablet depicts a human head eating from a bowl and drinking from a conical vessel. The tablet is marked with scratches that record the quantity of beer assigned to each worker and this is why it is known as the oldest record of pay for work ever discovered.

According to a Smithsonian article, this poor payment was not unique to Roman soldiers. Paying workers with beer was also prevalent in ancient Egypt, circa 25th century BC, when “around a total of 4-5 litters of beer were assigned daily to the laborers working on the Great Pyramid.” By the time of the Hebrew Book of Ezra (550 to 450 BC), salt production was strictly controlled by the ruling elite. The servants of King Artaxerxes I of Persia said “we are salted with the salt of the palace,” with the term “salt” meaning to be in service to. This is the original association between the term salt and work. So, the next time some smarty-pants tries to tell you the Latin word “salarium” originally meant "salt money" i.e., the sum paid to soldiers in salt, tell them to get new chat. Because, according to Peter Gainsford's 2017 book "Kiwi Hellenist: Salt and salary: were Roman soldiers paid in salt?”: there exists “no evidence for this.”

Top image: According to the pay slip found at Masada (inset), the Roman soldier Gaius Messius literally shed blood for nothing. Source: Luis Louro / Adobe Stock / Inset; Dr Jo Ball

By Ashley Cowie

To read hole article go to: https://www.ancient-origins.net/news-history-archaeology/roman-soldier-0014912

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Understanding reality: Towards a unified theory of existence via applied Dimensional Biopsychophysics: exploring the Triadic Dimensional Vortical Paradigm (TDVP) through demonstrating fundamental principles, the 4D-9D perspective, the mathematics of quantum calculus and the empiricism of gimmel.

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Neppe = VMN; Close= ERC

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4D-Science, 9D-Science, 9+ D-Science, 11 NCR, 11-Neppe-Close-Revolutions, Anu-s, Atoms, +Atomic, Biopsychophysics, Besant, Brandin, Cabibbo Angle, Cantor, CERN Large Hadron Collider, Calculus of Distinctions, Calculus of Dimensional Distinctions, Close, CoD, CodD, Conceptual, Consciousness, Content, Consciousness, Conundrums, Cosmology, Cynics, Dark Energy, Dark Matter, Density, Deniers,, Dimensionometry, Dimensions, Dimensional Biopsychophysics Diophantine Equations, Distinctions, Distinguish, Electrons, Entropy, Electron Mass, Equivalence, Experiential, Extent, Finite, Gell-Mann, Gimmel, Gluons, Godel Incompleteness Theorem, Higgs-Boson, Hilbert Space, Hubble data, Incompleteness Theorems, Impact, Indivension, Infinite, Infinity, Interdisciplinary, Interpretative, Interval, Koestler, Kuhn, Laws of Form, Levels, Life-Elements, LFAF, Lower Dimensional Feasibility Absent Falsification, Logical Systems, Mass-energy equivalence, normalized data, CERN Large Hadron Collider, Mass-Energy Equivalence, Materialism, Mathematicologic, Mathematics, Neppe, Neutron, Normalized Data, Not-Self, Ordinal, Ordropy, Perceptual, Peer-Review, Physics, Pokharna, Popper, Proof, Proton, Pseudoscience, Pseudoskeptic, Psi, QEUs, Quantum, Quantum Equivalence Units, Quarks, Refutation, Scientists, Self, Set Theory, Skeptics, Space, Spacetime, Speculations, Spencer Brown, Spencer Brown Laws of Form, Stability, Spin, Systems Theory, Tarski, Time, TDVP (=)Triadic Dimensional Distinction Vortical Paradigm (or) Triadic Dimensional Vortical Paradigm, TRUE =Triadic Rotational Units Of Equivalence, Unified Monism, Variable, Volumetric, Vortices.

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[b] Vernon M. Neppe MD, PhD, Fellow Royal Society (SAf) **, DPCP (ECAO), DSPE, BN&NP, DFAPA, MMed, and Edward R. Close PhD, DPCP (ECAO), DSPE *. Pacific Neuropsychiatric Institute, Seattle **; and Exceptional Creative Achievement Organization (Distinguished Fellow *, Distinguished Professor **) For perspective, Prof. Neppe is both a Dimensional Biopsychophysicist (including Consciousness, Psi, Déjà vu, and Survival Researcher, Phenomenologist, Philosopher, Mathematical-physics theorist, and Creativity expert) and Medical Researcher (as Behavioral Neurologist, Neuropsychiatrist, Neuroscientist, Neuropsychopharmacologist, Forensic specialist, Psychiatrist, and Epileptologist,) His CV includes 11+ books (e.g. *Cry the Beloved Mind*, 4 books on *Déjà Vu*, and *Innovative Psychopharmacotherapy*) , 2 plays, 800+ publications, 1000+ invited lectures and media interactions worldwide. He is also Adjunct Professor, Department of Psychiatry and Behavioral Neuroscience, St Louis University, St Louis. (http://www.vernonneppe.org/about.php). Dr. Close is a Dimensional Biopsychophysicist, Physicist, Mathematician, Cosmologist, Environmental Engineer, Philosopher and Poet. *Transcendental Physics* is one of Dr. Close's 8+ books. (www.erclosetphysics.com). Neppe and Close co-authored *Reality Begins with Consciousness: A Paradigm Shift That Works.* (now in its 5th edition).(See www. Brainvoyage.com)

[c] Various forms of the material in these sections has gone through numerous peer-reviewers and readers lately between January 2020 to Feb 2021.It contains several articles and parts of our work are reprinted in sections to ensure the key elements have been included. We greatly appreciate the editors and staff in *IQNexus J, Int J Phys Res Appl, J Psycho Clin Psychi, DIJECA, WISE J,*

[d] Acknowledgements: Our great thanks (alphabetically) go to: Adrian Klein PhD of Israel for his astute observations not only in some of these papers, but over many years of working with us; Stanley Krippner PhD of the USA, our great common-sense mentor who has inspired us even in this paper; and Surendra Pokharna PhD of India, whose recent intensive studies of TDVP with several Indian physicists is inspiring new ideas on all sides, and who recognized our work in 9D science in this paper, and Joseph Slabaugh and Scott Jacobsen, whose suggestions have been invaluable. We also thank Dr. Leonard Horowitz for his critically important feedback. We greatly acknowledge the contributions of (alphabetically): Lis Neppe, Erich Von Abele, Suzan Wilson, the editors, and five other PhD physicist referees.

Perspective to "Understanding Reality: Towards a unified theory of existence via applied Dimensional Biopsychophysics: Exploring the Triadic Dimensional Vortical Paradigm (TDVP) through demonstrating fundamental principles, the 4D-9D perspective, the mathematics of quantum calculus and the empiricism of gimmel" (an important 'read me first' clarification)

Vernon M. Neppe MD, PhD, FRSSAf, BN&NP, DFAPA, DPCP(ECAO), DSPE and Edward R. Close PhD, PE, DF(ECAO), DSPE. [e f]

The article that follows is *highly* specialized and has been three years or more in the making. It demonstrates key conclusions with mathematical and empirical derivations. This paper includes tens of new, complex concepts in Dimensional Biopsychophysics (DBP). For reference, Parts 1 and 3 are less technical, and Part 2 contains significant mathematics. These deep ideas are best mastered by Classical Physicists through prior separate studies in DBP describing the key features of the Neppe-Close Triadic Dimensional Vortical Paradigm (TDVP). *A great deal has been published already*. We suggest articles that may help such as PHYSICS AND TDVP [1g] or the equations of physics EQUATIONS of physics [2 h], the basics [3i] of GIMMEL [3; 4] or any of the 20+ GROUNDBREAKING [5j] on pni.org. These links include cosmological and quantal ones linked with Gimmel and TDVP.[6] Separately, Vernon Neppe and Ed Close describe HIGHER CONSCIOUSNESS [7 k]. You can download thousands of pages of their peer-reviewed articles on www.pni.org. These will allow greater perspectives to the DBP concepts, for example, on extra dimensions, distinctions, higher consciousness and infinity. Another DBP 4D-9D-9D+ [8] 101 or 201 article may assist with discussing the limitations of 4-dimensional physics. Moreover, for the more general reader, the sections on MORAL PHILOSOPHY [5l] provides an important linkage with spiritual and ethical issues [9], good and evil [10] and free-will [11] and on PHILOSOPHY [12m] itself, we include the related concepts of Unified monism UNIFIED MONISM[13], LFAF [14n] (Lower Dimensional Feasibility Absent Falsification) an extraordinary way of validating research and the THE REVOLUTIONS OF SCIENCE [15o] involving changes in our science perspective. *These articles on pni.org allow preliminary training for studying this graduate level article of the new DBP subspecialty and clarify Understanding reality: Towards a unified theory of existence*. [16]

Readers might perceive our physical reality only as limited to our experience—3 dimensions of space in a quantum in time (3S-1t) (a 4-dimensional [4D] model). [8] The Classical 3S-1t scientist might have little background in the *extra multidimensional measures of Time, Space and Consciousness*. This contrasts with DBP studies: 3S-1t still reflects the critical physical portion of a multidimensional model with extra 'consciousness' and possible multidimensional time: Our overt experiential 4D —3S-1t—physical world

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[f] This article originally was a composite of the dozen plus cited above plus Part 2 is entirely new: Portions had gone through dozens of peer-reviewers in various iterations. Revisions January 2020 to Feb 2021. There is no financial support or conflict.
[g] Physics: http://www.pni.org/groundbreaking/Physics-TDVP-Neppe-Close-ijpra-aid1018-200120.pdf;
[h] Equations: http://www.pni.org/groundbreaking/Equations_NeppeClose.pdf
[i] https://www.youtube.com/watch?v=RhV96ShslU4
[j] http://www.pni.org/groundbreaking/
[k] http://www.pni.org/neuropsychiatry/consciousness/Consciousness%20final_20027%20_JPCPY-11-00666.pdf
[l] http://www.pni.org/neuropsychiatry/moral_philosophy/
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[n] http://www.pni.org/philosophy/LFAF_NeppeClose.pdf
[o] http://www.pni.org/philosophy/The-Revolutions-of-Science_NeppeClose.pdf

only exists as part of a more covert 9-dimensional quantized finite vortical volumetric model embedded in an ever-extending, eternal, endless consciousness of Infinite Continuity existence. We have demonstrated mathematically and empirically that *our TDVP model creates a unified model of the Laws of Nature applying to everything* (with no Quantal weirdness requiring its own laws and contradictions, incompletely appreciating Dark Matter and Dark Energy mysteries, and different laws for our living macro-world.) Our physical *experience* is but a portion of all that *exists* and the infinite continuity continually impacts us. We direct this paper at this group of 4D scientists, but hope to educate in, for example, Dimensional Biopsychophysics, a new discipline which we proposed, developed, validated and eventually mathematically proved and empirically demonstrated. There are some 60+ unsolved problems in 3S-1t, solved in a 9D finite existence with the infinite continuity.[8]

Let's draw an analogy: If we were to referee an article—for example, with Prof. Neppe as an MD, PhD, Fellow of the Royal Society (SAf) who has a whole string of other qualifications and 800 publications to boot – about the qualitative and quantitative mathematical differences between *apples and oranges*— our comments even to many ostensible but untrained expert readers might appear very relevant, and our expressed opinions might *appear believable,* despite us actually being very unqualified. Likewise, a Classical Physicist expert might unjustifiably condemn us for our 9D model or gimmel or TDVP. We would then be the *'scientists who brought up new ridiculous ideas pertaining to life, consciousness, reality, infinity and extra dimensions'* because we don't recognize the prevailing quantal contradictions accepting the 'weirdness'. Yet, could it be that the 4D Physicists might be the ones lacking in knowledge of the qualitative and quantitative differences between the metaphorical apples and oranges and who might not even recognize their training 'weirdness' limitations? Sadly, it's much easier to condemn new knowledge, not knowing the whole context and supported by 'pontifical' University systems effectively teaching that *'the world must be flat'*: The ostensibly believable authoritative points of some Standard Model of Physics experts would appear legitimate, logical and pertinent. With respect, we could even encounter this problem with the opinions of accredited even Nobel level 4D physicists: They sound reasoned and scientists would just understand how the true physicists have needed to accept the mysterious contradictions as the unsolved mysteries of physics. How many 4D physicists have just accepted this illogical 'weirdness' of quantum physics [17] in its conventional 3S-1t form? It should not be that way, though. Simply put, a 4D scientist might be as out of place refereeing the cellular structure of the contrasting apples and oranges as refereeing 9D DBP data!

Furthermore, the 4D scientists of today (physical materialists) could argue that we (Close-Neppe) *'don't understand anything about calculus.'* After all *'everyone knows that Infinitesimal Calculus is correct.'* But it's *not a matter of 'correct', but a matter of 'appropriate for the task'*. Moreover, we further recognize that there is more than just Leibnizian-Newtonian Infinitesimal Calculus. [7; 18] Importantly, we cannot usually apply Infinitesimal Calculus to TDVP research because it does not have *lower limits* to quantal phenomena. [17; 19; 20] This is why we needed to develop and apply the Close-Neppe Calculus Of Dimensional Distinctions (CoDD) [17; 19; 20] . The CoDD recognizes the integral limits of our quantal world. A misguided 4D scientist wrote: *"Drs. Close and Neppe seem to be in a community of scientists that like to muse and there is nothing wrong with that in principle. But really, gimmel - non-physical components needed to form stable atomic structures and organic compounds supporting conscious life?"* This sadly appears to reflect critical ignorance of the limits of 4D physics and possibly of the most landmark of discoveries. To many 9D scientists, **gimmel might be the most important discovery in science of this century: It's proven both mathematically to be necessary, and empirically with its Large Hadron Collider (LHC) correlates. Gimmel is the most ubiquitous requirement for stability for anything with mass and energy, for life and unifying the finite with the infinite.** It required a creative jump to recognize gimmel in TDVP models. Moreover, the mathematics we present is largely new: *What do most conventional scientists know about Diophantine Equations? How many 4D referees or readers have studied about the various tiers [7; 18] of consciousness [21]? How much have they understood why there has to be 9 dimensions and specifically 9 not*

10 or 11 or 26 or any other number, other than an exponent of 9 like 81? Is this selective ignorance part of the problem that we encounter? We could send our data to 100 conventional physicists without backgrounds in this new specialty of Dimensional Biopsychophysics and they'll not recognize its relevance. It's simply outside their training and expertise. Yet, we're dealing with the most important extended 'physics' discoveries of this century. The math has proven important but so are the many, many other discoveries.

With respect, our work is now empirically proven because the Mass-energy equivalence normalized data in TRUE neutrons, protons and electrons is identical to the CERN Large Hadron Collider data. [22; 23] (TRUE is an acronym for Triadic Rotational Units of Equivalence). [23] Moreover, the key is our discovery of data suggesting that there is a proven quantal consciousness. [21] This is a necessary and *ubiquitous* third component to reality—an extra massless energyless component, we call **'***gimmel'***.** [4; 24; 25; 26; 27] *Without gimmel, no stable particle can exist for more than microseconds.* This is not only at the quantal level but applies even cosmologically where ratios of (Dark Matter+Dark Energy):Universe and Gimmel:TRUE correlate amazingly at the level of 1:1250. [28] Plus in our macro-world, scientists applying our model of Triadic Dimensional Vortical Paradigm can even explain why the 'life-elements' are different from the other elements. [28] We postulate, too, that gimmel is not only in quantized reality but part of the infinite continuity.

To Dimensional Biopsychophysicist, and author, Dr. Alan Hugenot DSc:

"It is my opinion that TDVP, TRUE units and Gimmel taken together constitute one of the most profound and far-reaching discoveries in the history of science. After years of research and refinement of their concepts, they (Close and Neppe) have finally placed consciousness research on a solid scientific foundation. They have given fellow scientists a replicable and verifiable means to mathematically test, verify, or disprove matters of psychology, spirituality, and metaphysics."

Similarly, the highly respected Indian Solid State Physicist Dr. Surendra Pokharna who suggested the contrasting terms 4D versus 9D scientists described gimmel: [8]

"We cannot have any particle, tiny or macroscopic or in our astronomical reality, without what is called 'gimmel'— Neppe, Close and I and others regard gimmel as consciousness, or its vehicle as there is simply no other explanation …" "Neppe and Close have provided the data to solve complex questions by TDVP. Effectively, once one introduces extra dimensions, infinite continuity which embeds the 9 finite quantized dimensions, and consciousness/gimmel—"the God Matrix"— with math proofs plus unified reality as key points, the solutions for all finite reality become easier. This is why their TDVP model—unlike any other scientific model based on the Theory of Everything (TOE) criteria analysis—works, and why TDVP so closely reflects and encompasses the spiritual aspects."

We hope that the more educated 4D physicists will recognize this technical article as not an introduction but a *sequel* to our work. In our humble opinion, the key components are correct. After a decade of building on concepts and then examining feasibility and rarely being able to mathematically prove some of our ideas no-one has been able to refute it: Ed Close and I have joked that maybe we ought to come back in 100 years' time, or maybe just 50, to see how the world is understanding our work and whether it's still perceived as largely scientifically and pragmatically correct. We have come to this world to sing our song but the tunes might not be ready for many classical physicists.

In essence, 4D 'reviewers' can easily miss almost all of the main points of the paper, especially the concepts justifying basic departures from the current mainstream paradigm. They could misrepresent the apples and the oranges with of some of the specific details of this paper, parroting long-held beliefs and misinterpretations common to mainstream science, such as the completeness of the "abstract vector spaces" of Hilbert space, which cannot actually exist in quantized reality, yet are accepted as representing reality by mainstream scientists because they work on the scale of measurement orders of magnitude above the quantum scale. We appreciate there might be the cynical 4D readers who ridicule because they are not aware

of options beyond 4D: 9D or gimmel or the infinite continuity must seem like craziness to these scientists. But are they missing findings as revolutionary as Relativity, Gravity and Quantum mechanics with the definitive corroborating results we have demonstrated?

Yet, many 4D reviewers are most likely accepted as reliable judges of valid science. They might be, but not in Dimensional Biopsychophysics, just as we are not experts in differentiating apples from oranges in structure, chemistry and life properties. So again, for those new to Dimensional Biopsychophysics, please read some of our prior papers in preparation for this complex one. Our statements are based on data.

In effect, some 4D scientists might not easily admit variants of the following sentences: *"I'm too threatened by this. I want to stay with what I know. In any event, I must not need to unthink what I've learnt. And I'm an academic and my job is at stake."* Instead, ironically, often those who shout the most about maintaining the status quo, are *ignorant of their own ignorance* about a proposed new paradigm. They've not studied the paradigm in detail, and likely might not even have the requisite training and experience even to make judgments. [29; 30; 31; 32; 33; 34] However, we *agree* with a 4D referee's comment: "*Mainstream science needs to weigh in on an article like this before it is anything more than a thought piece."* This is why this paper is specialized and far more than a 'thought piece': We describe the math proofs and the empirical demonstration of our data including how (as indicated) Triadic Rotational Units of Equivalence (TRUE) even corresponds with the Mass-energy equivalence normalized data in the CERN Large Hadron Collider. Our quantum and dark matter and energy and life elements calculations from our previous papers [2] are very exciting because they track groundbreaking changes in our models. [35; 36]

Ultimately, we have empirical and math data proving our hypotheses. We have long gone beyond speculation, with respect. This unifies reality and does not require separate laws of nature for the quantal, life element macro-reality, and the cosmological; moreover, the same laws apply to the 4D physical experience contained within the finite 9-dimensional quantized vortical volumetric model embedded into the infinite continuity. We exist in a single reality that obeys the same extensive laws of nature.

So please look at the empirical data. Our sections about quantum reality reflect an illustrative component of the value of our work, but parts like this are highly, highly specialized. For example, there are disciplines of mathematics, and one discipline is number theory combined with mathematical physics. Some experienced and well-qualified Dimensional Biopsychophysicist scientists have studied our Triadic Dimensional Vortical Paradigm including Triadic Rotational Units of Equivalence (TRUE). Let's briefly review these comments:

How do four specialized and internationally known Dimensional Biopsychophysicists perceive this work? We quote these not to brag or exaggerate, but to contrast their comments from some of the 4D physicist 'referees'. The difference is dramatic and appreciated, but we cannot necessarily agree with such praise: It's not us—we're just doing our best and accessing whatever outside 'Consciousness' that we can. Parts of these opinions are verbalized by several or all of these four scientists so as to show the ideas are consistent. These repetitions might then contrast with the opinions of the establishment 4D scientists duplicated.

The gifted Indian Solid-state Physicist, **Dr. Surendra Pokharna PhD:**

"Dr. Neppe and Dr. Close are eminently suitable for major awards because of their extraordinarily groundbreaking TDVP paradigm which they jointly have authored and painstakingly developed over more than ten years. Please bear in mind that, in my humble opinion, *the Triadic Dimensional Vortical Paradigm of Neppe and Close of its own stands as the most profound scientific work of this centur*y. And moreover, although purely scientific in nature, it impacts significantly on concepts like higher consciousness, spirituality and even divinity. *TDVP deserves a Nobel Prize in Physics of itself.* The TDVP model involves not just one breakthrough, but constitutes many revolutionary advances. Consequently, both are deserving the highest recognitions."

Similarly, we extract phrases from American **Dr. Alan Hugenot DSc:**

"Neppe & Close have effectively unified science and spirituality. Part of this is their recognition that this 9-dimensional finite reality is embedded within an infinite continuity. ...this factor cannot be substituted with any other number of dimensions...."(Their) unification of quantum physics, macro physics and cosmology creates a Triadic Dimensional Vortical Paradigm (TDVP) and a law of quantization which also allows for the laws of nature to be applied." "While we cannot yet fully foresee everything that this break-through may portend, on the other hand, their contribution is truly groundbreaking and will cause major paradigm shifts through all the disciplines of science"...."This deserves a Nobel prize"...."these two polymaths...appear to be amongst the most creative thinkers currently advancing science in our world today. "This ground-breaking work for the first time provides a rational foundational theory and basis for the ...volumetric quantization measurement of consciousness, which they have verified through a new Calculus of Distinctions, fully demonstrating mathematically how, as Max Planck stated, the underlying matrix of the universe is made of consciousness."

Again to provide the 4D-9D expert contrast, we now extract different quotations from the Israeli Dimensional Biopsychophysicist polymath **Adrian Klein PhD, PhD, DMD** in sections:

"Neppe and Close have provided a profound groundbreaking new theistic understanding, reflected in their remarkable book title, Reality Begins with Consciousness: A Paradigm Shift That Works....This is a work that will change mankind's future ...For the first time in mankind's history, its real nature is scientifically disclosed at the highest charismatic academic level! ...Reading your masterpiece,..... be aware of my deepest reverence for your monumental work! ...A seismic shift in understanding the understanding process itself! ...The beginning of the ultimate disclosure about the nature of an all-encompassing reality. ...A monumental work forcing obsolete preconceptions to crumble....The 21st Century's revolutionary paradigm shift."

And finally, the recently deceased American **Dr. David Stewart PhD, DNM** [37] Professor Stewart, a Physicist, Mathematician, Theologian, Herbal specialist, and Author of 20 books had studied TDVP and our papers in enormous detail and provided a spontaneous and kind perspective.

"In summary, I rank Dr. Edward R. Close and Dr. Vernon M. Neppe as peers of the major authors of modern physics and mathematics. I equate them with greats, such as Planck, Einstein, Heisenberg, Schrödinger, Bohr, Dirac, Born, Pauli, Bell, De Broglie, (and) their predecessors such as Newton, Maxwell, Leibnitz, Kelvin, and many others. The Neppe-Close work, which is built upon the works of these extraordinarily brilliant and innovating pioneers, has clarified, and extended the science and mathematics that these geniuses originated over a century ago. Drs. Neppe and Close, with respect, are two unique individuals in our world who are metaphorically singing their song, and that song is making our world more spiritual and transcendent. The work of Close and Neppe has laid a foundation for all future science to develop. The world of scientific understanding, in all fields, has been permanently changed, and set in a new direction, by the work of Close and Neppe. The future of all mankind is forever brighter because of what they have done. And they aren't finished, yet. I foresee the day when they will both be awarded other honors, such as a Nobel Prize in Physics. If there were an equivalent award in Mathematics, I would nominate them for that prize, as well."

Another **colleague** has commented:

"What is more important than a whole new paradigm for reality that ostensibly demonstrates a unified theory of all reality, combining the finite and infinite into a unit, and creating a single model to understand the quantal, macroworld and cosmology? No-one (not even Einstein) had been able to unify these ideas before Neppe and Close. Some would say 'but what's its practical relevance'. This will come: We have great ongoing practical applications for nuclear physics, gravitation and electromagnetism. Applied TDVP and Dimensional Biopsychophysics has begun: For example, the Neppe, Pokharna and Close research on the Besant quantal remote viewing. [38] This information published 100 years ago appeared illogical until

reanalysis using the Triadic Dimensional Vortical Paradigm and Triadic Rotational Units of Equivalence converted the results into the *highest ever statistics against chance in any psi research.* Moreover, because the original data was published a century ago, and the Periodic Table of the Elements scores applied remain undisputed, [39; 40] the Besant data appears to be fraud-proof. This would could only have been discovered through applying Triadic Rotational Units of Equivalence and appreciating a 9D model."

"Unfortunately, some researchers might ignore the implications of Neppe-Close TDVP model. This could be a product of them wearing blinkers where they cannot see beyond their noses: And yet, if they applied these ideas, the breadth of advancement is profound, just as relativity, gravitation and electromagnetism change the worlds. This is the challenge for the young researcher! There are hundreds of young PhD students studying other multidimensional models like String Theory and its variants: These have remained 'theories'. Yet the Neppe-Close work beginning with their classic book Reality Begins with Consciousness: A Paradigm Shift That Works and culminating in the mathematical and empirical validations including the discovery of 'gimmel' have been neglected."

How do we answer those who appreciate only 4D physics? Theirs are not the 'final ideas in reality'. They should not referee 9D. This is because the 4D models cannot of their own solve the 60+ contradictions or unsolved conundrums that occur when we just apply the classical Standard Model of Physics. Importantly though, we do not deny Classical Physics [p]or basic math: Our physical macroworld functions exceedingly well and consistently and 4D is part of 9D. Despite the 3S-1t experience still being pertinent, 4D still remains part of the 9D quantized volumetric finite larger reality. From the viewpoint of the mathematics, this lengthy paper might illustrate very well how physicists, even those who consider themselves to be open to new ideas, have never taken a serious look at the way abstract mathematical concepts are improperly applied to physical reality at the quantum scale. Our awareness expands thinking into new areas. We truly hope to spearhead related tasks before we pass over, and we're in our senior years. *If there's an opportunity to fund our yet unfunded work, please consider it. It's worth it: Not so much for us, but for the world.*

We hope these complex pages will allow greater understanding of what our magnum opus is, namely the derivation and application of TRUE quantum calculus for the analysis of quantized reality. This includes empirically verifiable new approaches to mass, neutrons, protons, law of conservation, infinite continuity, gimmel, TRUE, TDVP, isotopes, vortical rotation, unifying gravitation and electromagnetism, and spin. The difference between this paper and the previous ones is the portrayal particularly in the more complex 'Part 2' of the mathematical and empirical demonstrations that this work is not just one more imaginative speculation. Our data is scientifically based, feasible and often proven mathematically and shown to empirically correlate with real data that derive from the billions of dollars of research on the Hadron Large Hadron Collider or based on the figures derived from cosmology.

In summary, the TDVP model unifies the Laws of Nature: We solve the problems of 'quantum weirdness', of why the Life Elements are different, of how gimmel fits into Dark Matter and Dark Energy, of survival after death and ordropy (conservation of consciousness in the infinite continuity) and of meaningful evolution. All this involves a single explanation, leading to the Laws of Nature being unified and a consequent philosophical model of Unified Monism being proposed based on the science. And that science is frequently information that is feasible in several areas, including mathematics. This paper may be the most important and definitive we've ever written: To Dr. Adrian Klein, TDVP is 'earth-shattering!' Certainly, a model that scientifically unifies reality constitute a profound advance sought for a century. Readers can reach their own opinions but *only after adequate background study of the prior published materials and then this article.*

[p] We use the term 'Classical Physicist' broadly to include those who have been trained in conventional Quantum Mechanics involving 3-Space dimensions in a moment in time (3S-1t) as well as those who take our physical day-to-day reality experience as encompassing everything that exists. Effectively, Classical Physics is used synonymously, here, with 4D science.

Is conventional scientific materialism the truth or do we need to integrate the consciousness, and the multidimensional, moving from a 4-Dimensional physical reality? Abstract: Part 1.[q r]

Vernon M. Neppe MD, PhD, FRSSAf, BN&NP, DFAPA, DPCP(ECAO), DSPE and Edward R. Close PhD, PE, DF(ECAO), DSPE and Edward R. Close PhD, PE, DF(ECAO), DSPE.

Summary Abstract: *Our physical macroreality appears somewhat adequate when working simply within 3S-1t, because the rules of our world are consistent and easily applicable. However, even then, in 4D living, factors pertaining to consciousness are almost completely excluded neurologically and psychologically other than by applying our consciousness at the level of the nervous system. Nevertheless, at the quantal and the cosmological levels, multiple unexplained conundrums and even contradictions arise. These problems must be solved to explain our reality. Yet, we usually ignore these quandaries, disregarding anything unexplained beyond our current concept of reducing everything to 3S-1t. This might constitute a threat to our current training in 4D science, and the adverse emotions generated by the new findings we've demonstrated are difficult for even exceptional IQ individuals to handle.*

We describe the perceptions of the limitations of our experience when applying our current conventional physical paradigm of three dimensions of space —length, breadth and height—in the present moment of time (3S-1t). This application of 3S-1t has been called '4D science'. We use the term '9D science' to include higher dimensions, in this instance the 9 dimensional model which was definitively demonstrated in the Neppe-Close Triadic Dimensional Vortical Paradigm (TDVP). We further apply the term '9D plus science' (9+D). This incorporates the interface of 9D science with the infinite.

4D reviewers may ignore differentiating the 'wood from the trees'. There are more than 50 conundrums that reductionistic materialism cannot solve plus another 11 major questions. These are insoluble in 4D science, yet appear eminently soluble by applying the principles of 9D or 9D+ science. Peer review, though important, may also be problematic, for those untrained in 9D Dimensional Biopsychophysics. We specifically emphasize two ignored major findings in 9D science: the, quantized, volumetric finite 9D reality and the critical discovery of gimmel. We point out the reasoning for such studies.

The recently developed concepts of gimmel, of infinite order ('ordropy' as contrasted with physical 'entropy' in the finite 3S-1t) and the 'Law of Conservation of Mass, Energy and Gimmel' are not only finite but related to the infinite, and they impact on our 9D science. In contrast with gimmel, the concept of gluons [4], while fitting the logic for mass of nucleons in 4D science, is impossible to reconcile with 9D science because based on empirical mathematical calculations, gluons are demonstrably unstable. The difficulty with the ephemeral nature of the Higgs Boson is also problematic, but that too, may be solved by recognizing the application of gimmel, instead.

The 9D and 9D+ science model is a functioning and unrefuted major paradigm shift, that involves several major supporting empirical demonstrations and mathematical proofs, and has grown over the past ten years through applying the many features of the Neppe-Close TDVP model. It not only incorporates our current physical 3S-1t 4D science, but extends to 9D+ which is now mathematically proven. Furthermore, it is also empirically relevant given that the Mass-energy-gimmel-volumetric data in the Triadic Rotational Units of Equivalence (TRUE) in the Triadic Dimensional Vortical Paradigm (TDVP) exactly equal the Mass-energy equivalence normalized data in the CERN Large Hadron Collider. Cosmologically, the data also fits the gimmel, Triadic Rotational Units of Equivalence (TRUE) and 9D data, as it is further demonstrable. This is because the TRUE figures correlate very, very closely with the Hubble dark matter and dark energy Planck probe results. A key take-away point is that perhaps for the first time in history this allows us to unify our existence into one law of nature including the quantal, macroworld, and cosmological levels.

The 4D dilemma: We function well in physical reality, but It doesn't work for the complex. Section 1.

Vernon M. Neppe MD, PhD, FRSSAf, DPCP(ECAO), DSPE and Edward R. Close PhD, PE, DF(ECAO), DSPE.

George Bernard Shaw in his1918 play *Annajanska* famously pointed out [41]:
"All great truths begin as blasphemies."

Abstract: *Everything can be interpreted through our physical perceptions but there is more. Triadic Dimensional Vortical Paradigm (TDVP) is a model that theoretically and demonstrably empirically and mathematically works out. A simple mnemonic to remember the key principles of TDVP is DICE:*
Dimensions, Infinity, Consciousness and Experience/ Existence.

Sir Arthur Eddington, PhD, in 1938 [42] in *The Philosophy of Physical Science* famously described his lengthy analogy. This metaphor reflects the key theme of this paper:

"Let us suppose that an ichthyologist is exploring the life of the ocean. He casts a net into the water and brings up a fishy assortment. Surveying his catch, he proceeds in the usual manner of a scientist to systematize what it reveals. He arrives at two generalizations:
(1)No sea-creature is less than two inches long.
(2) All sea-creatures have gills.
These are both true of his catch, and he assumes tentatively that they will remain true however often he repeats it. In applying this analogy, the catch stands for the body of knowledge which constitutes physical science, and the net for the sensory and intellectual equipment which we use in obtaining it. The casting of the net corresponds to observation: for knowledge which has not been or could not be obtained by observation is not admitted into physical science. An onlooker may object that the first generalization is wrong. There are plenty of sea-creatures under 2 inches long, only your net is not adapted to catch them."

The ichthyologist dismisses this objection contemptuously.

"Anything uncatchable by my net is ipso facto *outside the scope of ichthyological knowledge. In short, 'What my net can't catch, isn't fish' Or — to translate the analogy — 'If you are not simply guessing, you are claiming a knowledge of the physical universe discovered in some other way than by the methods of physical science, and admittedly unverifiable by such methods. You are a metaphysician. ……The math is not there till we put it there.'"* [43, 44]

Because of the domination of science and technology in all walks of life, an impression has been created that our current scientific knowledge (applying just three space coordinates and one time coordinate—3S-1t) is the complete source of knowledge. It is linked with the Standard Model of Physics (SMP) [45; 46; 47; 48]. But the SMP appears to be incomplete because there are numerous conundrums and paradoxes at the quantal and cosmological levels. [45; 46; 47; 48]

The conventional scientist, steeped in physical materialism, does not realize there is anything wrong with this idea because they've only been trained in '*4D science'* —as the Indian atomic physicist, Surendra Pokharna PhD [49; 50; 51] calls it. This 'Science 4' reflects the prevalent view of many scientists involving conventional physical 3S-1t *experience* as the whole of reality.

Historically, with great respect, a half-dozen independent scientists from several countries who have studied

TDVP in detail are independently regarding it as the most important paradigm shift of the twenty-first century. Will this high regard bear itself out? Time will tell. Yet, conversely, TDVP also evokes palpable distress amongst members of the religion of 4D science. Fortunately, in these civilized times, at least they don't want to burn us at the stake!

Pokharna contrasts our current '4D science' with '9D science'. [49; 50; 51] This involves 9 dimensions in the finite reality. The detailed seeds of the idea of a 9-dimensional quantized vortical finite reality was first justified by Edward Close and Vernon Neppe in 2011 in the first two editions of their classic book *Reality Begins with Consciousness: A Paradigm Shift That Works*. [52; 53] They developed hundreds of concepts in detail over the next few years until the final 5th edition of this book in 2014. [54] During this time, they first hypothesized a mathematical proof of specifically a 9-dimensional reality, and then, in 2013, demonstrated the definitive proof of their paradigm [54]: Specifically, these scientists described a metaparadigmatic model which they've called the 'Triadic Dimensional Vortical Paradigm' (TDVP) [54]. TDVP has continued to grow over several years, with proofs of several new testable hypotheses, yet it has never been refuted. [51] This now includes the landmark mathematical *proof* of the necessity for a ubiquitous third massless, energyless component to reality variably described as a 'process', 'substance', 'agent' or 'vehicle' called *'gimmel'*. Mathematically, gimmel is in necessary union with all stable 'particles', without which atoms would fly apart. [2; 3; 4; 25; 26]

TDVP in summary has several major features but the key are in Table 1A.

TDVP key features: The DICE. Table 1A

D: **Dimensions** (and it turns out 9 *finite quantized volumetric* [3D] dimensions; dimensions have extent and are measurable).
I: **Infinite continuity**. No separations at the infinite continuity but this influences everything. In the infinite continuity, the dimensions extend forever in Time, in Space and in Consciousness in the infinite continuity. These constitute the Triad that is TDVP and the fundamental axiom of origin.
C: **Consciousness**: ICE: consciousness is measurable in extent with space being ultimately embedded in Time and Time in Consciousness. That is consciousness **extent**. But consciousness also has content, like mass and energy, but is massless and energyless as **content**. Extent requires content expression. Consciousness also has **intent / impact / influence** and can cause change. (mass and energy like earthquakes can also). Consciousness is likely what we've called 'gimmel' (which might be consciousness content itself or its vehicle in all these ICE guises —impact, content and extent.)
Consciousness is not noted much in our physical world of 3 dimensions of space in a moment in time (3S-1t) but hierarchically by the infinite continuity, everything is embedded in consciousness.
Consciousness is not a single phenomenon but has multiple descriptive prongs. [7]
E: **Experience** (which is what we perceive in our overt empirical 3S-1t physical reality) but that is just part of **Existence** (which is not only this overt 3S-1t but in 9D and involves a higher consciousness and higher dimensions of time, and these are embedded within an infinite continuity.

The *4D Science* opposition could argue cogently against these TDVP principles:

"This 9D framework threatens the current materialistic thinking. It challenges the 4D structure that has existed for millennia: In effect, there is only 3S-1t Experience: It is the sum of all reality."

9D science recognizes 9 finite quantized volumetric dimensions and is, with respect, far more complete than any other model described before. The Neppe-Close 9D model incorporates, too, 4D Science. Therefore, 9D+ science does not ignore our physical 3S-1t reality: It just adds to it. 'Science 9' is not speculative or just hypothetical, like the various String and Superstring Theories that work with multiple dimensions and usually involve curlings or foldings [55; 56; 57; 58; 59], not the necessary vortical rotations in TDVP, and, unlike

TDVP, do not generally recognize consciousness, extra time dimensions, infinity, and unification of all. Instead, we know that we *exist* in 9 finite quantized dimensions because of the demonstrable (Close-Neppe) mathematical *proof* and moreover, that this is not just a mathematical operation, but empirically relevant quantally [2; 60] and cosmologically [2; 60]. We (Neppe and Close) can add just to the concept of 'Science 9 in the finite', by recognizing '9D+ science as this 9D+ concept necessarily incorporates the continuous infinite and the still discrete, quantized transfinite [61; 62; 63; 64; 65; 66]. That addition is needed to complete a metaparadigmatic model [54] (a so-called 'theory of everything' —TOE [65; 67]) because otherwise the limiting factor would be the 'incompleteness' as reflected by *'Gödel's Incompleteness Theorems'*. [68; 69] Something different must be 'outside the box' so to say (like the ' infinite continuity' contrasted with 'the quantized finite').

This article is a composite of several of our previous articles [8; 70] with amplifications [71 70; 72; 73 1 38] and then includes the key article series pertaining to quantum mass and math [74].
9D+ science makes a big difference in solving the many ostensibly insoluble conundrums of SMP physics. Most scientists applying only the 4D physical reality don't even realize a 'Consciousness' that is separate from the material of our brains exists, because 'Consciousness' likely reflects a pervasive Higher Consciousness mainly existing outside the brain and at different higher dimensional levels (like 5D to 9D). This extended consciousness interfaces continuously with our finite reality. It also reflects the infinite continuity [54], but it still even occurs at the most fundamental quantized level. [54]

In essence, the main take-home message for readers is that 4D science as currently postulated is correct but only to its limits. It is, in truth, incomplete and part of 9D as the 9D finite quantized volumetric existence provides a richer mathematical and empirical set of solutions to conundrums in 4D scientific explorations. Moreover, this 9D finite existence is further embedded in an infinite continuity (that which exists with neither beginning nor end), and this allows for the complete reality—eternal, forever extended, and bottomless in consciousness. So, 4D finite to 9D finite to infinite continuity reflect a threefold unitary mental construct transition in the thinking if individuals who want to conceptualize TDVP.

The 4D refutation: Dialog with a respected 4D scientist. Section 2.

Vernon M. Neppe MD, PhD, FRSSAf, DPCP(ECAO), DSPE and Edward R. Close PhD, PE, DF(ECAO), DSPE.

Abstract: *The difference between a highly trained scientist practicing physics in our 3S-1t experience and one who recognizes this is part of reality only is enormous. There are 60 plus unsolved conundrums in 3S-1t; these are explained within a 9 dimensional finite quantized volumetric reality embedded within an infinite continuity.*

A highly respected, and well-known PhD Professor in the biological sciences steeped in the scientific materialism on 4D science,-who had rather typically he had not studied any 9D science or any of our TDVP work. His e-mailed description (on 12th July 2018) was appropriate for a 4D-scientist :

"*There seems to be a large pseudo-scientific community who love theories that separate the mind from the body, but I have yet to see a theory (as much as I would love to believe I somehow persist after my body functions shut down) that shows that consciousness is more than just an emergent property of the neural system component of a total body system that only becomes conscious through learning within the womb and*

subsequent to birth. That consciousness will close down on your way to final bodily function shutdown. Not that consciousness remains largely an unsolved mystery! But making up scientifically unsupported stuff about it does not enhance our knowledge, though it may enhance our feeling of wellbeing. I believe we may come to understand consciousness as something necessary for strategical planning, which would be a great boon to the fitness of an organism only able to implement tactical decisions on the scale of generational time."

Dr. Neppe responded: *"Let me not to the marriage of true minds admit impediments. I respect you too much. You are correct that our TDVP work logically provokes incredulousness from that majority of scientists who regard the Standard Model of Physics (SMP) as very adequate.* [54; 75; 76] *This might be even though they recognize there are unsolved or contradictory elements certainly at the quantal level in the SMP* [54] *(and just regard it as 'weirdness'* [77; 78] *or similar such term). Our TDVP work greatly respects the findings of the SMP. We're able to live our lives knowing there is predictable and often replicable order. However, TDVP also particularly recognizes those SMP limitations of quantum physics and cosmology and extends them, and. explains a large number of other conundrums, proving the math bases to many of those."*

With respect, this view by the 4D scientist is not new. This reflects *the prevailing materialist view of our world*. It is a sophisticated view, yet incomplete, something that might be confessed by many forward-looking 4D scientists who might point out:

"There is nothing else: We know everything other than minor little components. Yet, we recognize the obvious fact that there are three different, separate realities.

- *There is first, our macro-world of physical reality and everything we've learnt tells us this is appropriate and we can work with it.*
- *There is secondly, our world of quanta described through 'quantum mechanics'. We must just simply accept that, because we actually know that there is a 'weirdness' that we cannot explain.* [77; 78] *That is normal and okay. That's why it's 'quantum'.*
- *Third, we must recognize, too, what the cosmologists tell us, that there is Dark Matter and Dark Energy. We don't know too much about these dark substances because they are 'dark', and they don't reflect light or energy. But we know that they constitute over 95% of our world, and that they're very important."*

Are such words of certainty familiar? Is our main knowledge complete? Or has these possibly false convictions happened before? Have we gone through a phase where we're sure that everything that is in our world, nay, our reality, is known and there just are the details to fill in? *This certitude reflects the sad, rejected history of new paradigms.*

Ironically, by simply putting gimmel—the likely agent of consciousness—into the equations of reality, *all three of these areas become based on one single law of nature, not three diverse scenarios, and we can even understand biology more.* These are only soluble by applying 9D+ science, not just 4D science —a part of 9D+ science. Plus gimmel is an essential component in the infinite continuity, and this where the 'tongue in cheek' term, 'God Matrix' has been used. Gimmel is not an ephemeral particle like the Higgs Boson or a theoretical one like the gluon. It is a real, proven phenomenon that allows for stability of everything and likely contributes to life. We and several of our Dimensional Biopsychophysicist colleagues (such as Drs. Stewart, Pokharna, Klein and Hugenot) regard gimmel as the most landmark discovery of our lifetimes and the ultimate game-changer. Gimmel is not a theoretical concept: It can be demonstrated mathematically through the Calculus of Dimensional Distinctions. [4]

We always need honest skepticism. Sadly but possibly always needed, is *the rejection of major new paradigm shifts. This is common, fitting and almost expected.* [53; 54; 79] This is appropriate usually as the status quo is usually correct. The bar must be high for significant changes. [71]. The scientific revolution is not easy.

However, non-acceptance has historically been a problem with numerous pioneers. *It is extremely easy to throw mud at great discoveries.* But those discoveries must ultimately have justifiable mathematical and empirical proofs, and often these do not exist so the 'mud' is justified. *However, at minimum, the hypotheses posited must be feasible and not falsified as in the recent Neppe model of "*Lower Dimensional Feasibility Absent Falsification" (LFAF). [14; 44; 72; 80; 81; 82] We argue that LFAF as an important amplification and progression of Popperian Falsification [83; 84] as LFAF extends the boundaries of scientific thinking. *But not easily so we caution. Yet, sometimes with their words, the scoffers might flow forth their character or, more kindly, their incomprehension.* Is *this rejection the unfortunate heritage of the great innovative original scientist or another misguided one? Certainly, in another way, it's a backhanded compliment that recognizes how much the new postulate is intimidating the mainstream.*

The victims of such *mud-throwing, or just being ignored,* ranges very broadly. A little known example was Georg Cantor PhD [85], who was rejected and abused for his creative awarenesses, but eventually won the Sylvester Prize in 1904. Dr. Cantor was recognized particularly not only for Set Theory, recognizing one-on-one correspondences, and for revolutionizing the concepts of the infinite, including the transfinite and infinity of infinities.

The great Albert Einstein [86; 87] is another example: He spent the years 1915 to 1919 being rejected until that same Arthur Eddington PhD demonstrated on 29 May 1919 that General Relativity empirically works. [42; 88] Then Nicola Tesla was the great genius whose findings on modern alternating current were never accepted during his lifetime. Another example was Ignaz Semmelweis MD who was brutally rejected for pointing out that hand-washing saves lives and had a tragic history thereafter. Similarly, Gregor Mendel's genetic inheritance pre-Darwin was rejected; and Alfred Wegener was rejected for describing continental drift. These spurnings go back to antiquity: Aristarchus, some 2400 years ago, discovered the heliocentric solar system, but was derided by his 'more knowledgeable colleagues'.

Their only crimes? Daring to be heretical or daring to show the limitations of the current reality. They were all so far ahead of the curve that this was very threatening.
Arthur Koestler in his book, *The Sleepwalkers*, summarized it best (modified):

"Innovation is a twofold threat to some academics: it endangers their oracular authority, and it evokes the deeper fear that their whole, laboriously constructed intellectual edifice might collapse." [89]

That we exist in 9D+ science is not incorrect. Our finding is just new. The great physicist who discovered the quantum [90], Max Planck famously pointed out that *"major paradigm shifts in science advance only from funeral to funeral"* [91] Ironically, Planck's ideas, too, were initially rejected as a *"crackpot"* at first. [92; 93; 94] Frank Sulloway, [95] historian and sociologist of science, in *"Born to Rebel"* covers scientific changes that were resisted or embraced change. Almost every major revolutionary breakthrough had some thinkers who rejected it as "crackpot" at first. Other examples include Copernicus, Hutton, Darwin, Descartes, Newton, Lavoisier, Lyell, and Lister. [95]

We could add a modern medical example of Warren and Marshall with helicobacter causing peptic ulceration and the related dialog: [96] *"But I thought biologists were too close-minded?" ……"No one believed it: The Australians' idea was very much against prevailing knowledge and dogma because it was thought that peptic ulcer disease was the result of stress and lifestyle,"* Staffan Normark, a member of the Nobel Assembly at the Karolinska institute, said at a news conference."

The fifty overt unsolved conundrums in materialism:
Neppe continued his rhetoric with the materialist-oriented 4D scientist:
May I, for my own understanding, clarify how you solve the following 50 short questions? These are just

examples of 50 questions that as I see it the SMP [54] cannot answer.

1. How can you explain 'quantum weirdness'?
2. How can you explain dark matter and dark energy? What are they? Are they necessary? How can they be incorporated into scientific understanding?
3. What are the common features of the life elements and why?
4. How do you explain that the Cabibbo mixing angle is about 13. 04 degrees? Why is the Cabibbo quark mixing angle exactly what it is?
5. What areas in physics can the standard model not explain?
6. What would happen if there were a 9-dimensional reality? What qualities would that 9-dimensional reality need to be stable?
7. Why is the concept we're taught mathematically in schools of Protons, Neutrons, and Electrons producing Atoms incorrect? How can we solve that?
8. How can you mathematically refute atomic materialism?
9. Why is Deuterium so important?
10. Are the mass-energy-volume figures from the Large Hadron Collider correct? If so, what would happen if an entirely different model with a massless, energy less third substance generated the same figures? Why?
11. Can we have multidimensional time?
12. Why is gimmel so relevant in beta decay?
13. Why are vortices so fundamental?
14. Why are atomic particles not really particles but vortices?
15. Why might gluons not exist?
16. What can replace the Higgs Boson?
17. Why is there conservation of mass, energy and gimmel implying order as well as disorder?
18. Why must the laws of nature must be unified: How are they unified and universal?
19. Why is everything in nature volumetric in space, time and consciousness.
20. How does entanglement occur? What is quantum entanglement?
21. How do you explain half-spin, one-third spin, two-third spin for example?
22. What properties make for life elements?
23. Why must silicon be a life element?
24. Why must continuous infinity envelop the finite discrete?
25. Why are protons composed of three quarks?
26. Why are neutrons composed of three quarks?
27. Why are each of those six quarks different?
28. How do we measure multidimensional consciousness?
29. Why are most of the particles of the "particle zoo" ephemeral?
30. Why do fermions have a ½ intrinsic spin?
31. Why Hydrogen atoms have no neutrons?
32. Why are there neutrons?
33. And why must deuterium atoms exist?
34. Why is the mass of the proton exactly what it is?
35. Why is the mass of neutron is exactly what it?
36. Why is the neutron not anywhere near as stable as the proton?
37. Why are protons so stable?
38. Why is Hydrogen stable?
39. What is the role of Helium and neon?
40. Why are they different from Argon and Krypton?
41. Why are the life-supporting elements abundant?
42. Why is the universe expanding?
43. Why are elementary objects spinning?

44. Why is the speed of light what it is?
45. Why is there no matter as such?
46. Why are quanta not particles?
47. What are elementary particles actually?
48. What really are dark matter and dark energy?
49. What creates mass?
50. How can you unify the laws of nature?"

Of these questions, the most important is the 'third component' 'gimmel' [6] an essential part of 9D science. Officially, we (Close and Neppe) described gimmel in 2014 as a massless and energyless 'substance', that is in necessary 'union' with every stable subatomic particle. Without the 'process' of what gimmel does, our world would simply not exist. [6] Gimmel is possibly the 'vehicle' or 'agent' of consciousness,

Some even greater conundrums (this is where the >60 figure comes in; 50 + 11).

Neppe then added some bigger level questions for this materialist and these were largely rhetorical.

A. Please prove why it is *absolutely necessary to have a 9-dimensional finite volumetric existence* (which *contains* the 3S-1t physical reality we experience)
B. Please prove why it is *absolutely necessary for there to be a massless, energyless third component for a stable reality*.
C. Please show why the mass-energy volumetric equivalence in the normalized 9D reality with this third component is *exactly equal to the data in the CERN Large Hadron Collider*? Please explain why that could be hypothesized.
E. Please explain when *another calculus* (not Newtonian) is applicable.
F. Please provide *mathematical and empirical proofs* for the 50 items listed above.
G. Please explain how you can extend science beyond Popperian falsification. When would that be applicable and how is it done today?
H. Please describe for me a mind-body model that is *not* separating mind from body and is *not* just *"consciousness is more than just an emergent property of the neural system component of a total body system that only becomes conscious through learning within the womb and subsequent to birth."*
I. If mathematical proof, combined with empirical data such as the LHC correlations were demonstrated, would that be scientifically unsupported stuff that does not enhance our knowledge?
J. Why do you think that TDVP disagrees with you *"about no grounds whatsoever to separate consciousness from the material world"*? Could it be that our 'material world' is based on incomplete knowledge as listed by the 50 questions above? And could it be that consciousness is not a separate dualistic component (as you point out)?
K. How do you explain other conundrums like Heisenberg's uncertainty principle, so-called wave-particle duality, and the origin of the Universe (the 'event horizon')?

These questions, with great respect, simply cannot be solved using the Standard Model of Physics as currently applied."
And they can in full be explained by TDVP.

Plato's analogy may be apposite:

The Greek philosopher Plato in his work *Republic* (514a–520a) presented his famous Allegory of the Cave. [97] [98]. Neppe condensed this: [99]

"Let me show in allegory how far our nature is enlightened or unenlightened.
The truth may be nothing but the shadows of images.
If told this were an illusion, would Man not fancy that the shadows he formerly saw were truer than the objects now shown to him? He will take refuge in the shadows which are clearer to him than the truth.
Is it not possible that the shadow Man sees is his physical reality alone?"

Effectively, once one introduces specifically the nine extra dimensions, infinity which embeds these 9 dimensions, and consciousness linked with everything: We've sometimes called this —tongue-in-cheek— by the term 'God Matrix' and the GM here is similar to Gimmel! [4] Suddenly, the solutions to these previously insoluble conundrums become easier: *We cannot solve a 9D puzzle through 4D alone.* With respect to the 4D scientists, we (Neppe and Close) have provided the data to solve these questions by TDVP. *TDVP solves every one of these questions. In every instance, a jumping point is the mathematical proof, usually combined with our limited empirical knowledge of today—like pieces of an incomplete (likely 3-D) jigsaw puzzle.*

Addressing specifics in TDVP (Triadic Dimensional Vortical Paradigm) *reality. Section 3.*

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Abstract: *We provide examples of complex but common ideas that are incorrect but accepted within 3S-1t. An example is Gluons. We show the patterning within the periodic Table of the Elements and the life elements.*

Certainly most of these answers are reflected in what many experts in the area have regarded as 'earth-shattering' [100] when they examined individually or collectively any of the Neppe-Close discoveries referenced in their 2017 paper on *'Fifty Groundbreaking Findings'*. Gimmel [25; 26; 101; 102; 103; 104; 105], 9-dimensions [100], infinity [62; 63; 64; 66; 106; 107; 108] and the associated unions of mass-energy and consciousness content [2; 101], of tethering of space-time and consciousness extent,[54; 106] and the unification of all, as in Unified Monism [13; 109], is with respect, literally changing our thinking about reality. [100] So, for example, let's briefly examine two of the above 50 questions asked by Neppe of the 4D scientist. We do not want to critique greatly and diminish such excellent Nobel winning research. Yet, sometimes changes are needed, or models are incomplete and the original Nobel work was based on 4D not 9D models. We respectfully asked: *Why might gluons not exist?* and *What can replace the Higgs Boson?* Perhaps the answer might be *"applying 9D or 9D plus science instead of the incomplete 4D science?"*

The gluon problem

We know from the TDVP research that 'gimmel' is in necessary union with all stable particles. [2; 3; 24; 26; 27; 102; 110] Gimmel is not a virtual particle or ephemeral. It is stable and exists and is necessary for everything in existence. Contrast this with the theoretical virtual particles called 'gluons' [111; 112] which Nobel Laureate Murray Gell-Mann [113; 114] postulated is necessary to allow appropriate mass for nucleons through strong electromagnetic carriers that bind quarks together. Gluons have been regarded as necessary to explain the mass of the atom and why the quarks of protons and neutrons stick together (like 'glue' as in 'gluons'). [111; 112] That was a wonderful idea and solved a problem for the neutrons and protons. It fitted the 4D-Science model well. However, unfortunately, Neppe and Close have *mathematically demonstrated* that the current concept of gluons is refuted in 9D science. [4] This is because gluons are not in union with electrons and therefore by math, this *regretfully* cannot work out as gluons alone, as hypothesized, would produce unstable atoms mathematically, and the atoms would simply fly apart. Yet, because the atoms remain together this means gluons alone in the form described cannot be correct. Everything is quantized and integral. You can't have half or a third of a gluon or more correctly a cube root proportion (applied via Cubic Diophantine equations).

Indeed, a great physicist-mathematician who has studied TDVP possibly more than anyone else, David

Stewart PhD, points out just how much of a significant paradigm shift this is, as Close and Neppe have apparently refuted why gluons either cannot exist as they do [4], or must reflect incomplete knowledge: [4] The inequality is that gluons are not linked with electrons. *This makes the existence of gluons mathematically impossible [2] because the atom would become unstable. (Table 3A)*

Table 3A: **Gluons and gimmel — volumetric calculations on the atom of life elements.**

Substance	Cube	Cube root	Integer?
Gluons	$68{,}697y^3$	40.995338y	**No**
Gimmel	$125{,}971{,}200y^3$	**108y**	**Yes!**

The Higgs Boson dilemma

Gimmel also contrasts with the Nobel-prize winning and, at the time, groundbreaking discovery of the Higgs Boson, at one point called 'the God Particle' [115; 116] (by Nobel Laureate Leon Lederman) [117], despite the Higgs Boson not reflecting anything spiritual. The Higgs Boson is another postulated virtual particle. But the link with TRUE is far less direct: The Higgs Boson bestows mass, too, but appears problematic, possibly, because it's so ephemeral (not existing beyond 100 septillionths of a second), and with gimmel may be redundant because gimmel would serve this function just as well. How would such an ephemeral concept work in our real world, and where does it fit in?

Gimmel

In contrast, gimmel is not ephemeral, but real and necessary and allows for all particles—including the six enduring quarks and the electron—to be stable. Without gimmel, no world would exist even temporarily. *[s 118]* Gimmel is a sine qua non that we have refined and applied over many years. *The discovery of gimmel allows for stability, demonstrates how fundamental mathematics is to the very existence of the universe, and allows recognition of a need for a consciousness reflecting perhaps the deepest levels of* Consciousness —possibly a *'spirituality', ensuring the Laws of Nature run smoothly,*

The life elements

As a further example, when analyzing the properties of the elements and of related gimmel, Close and Neppe have definitively demonstrated that what they call the most fundamental 'life elements' namely, C, H, O, S, N (spiritually with the acronym 'CHOSeN' which are the contents of spices in holy temples [119]) plus two other critical ones Mg and Ca, plus the noble gases Helium and Neon.

Predictably each of these elements have more proportionate gimmel than any other elements. [2; 60] Because Hydrogen is without a neutron yet very stable, it is profound in its gimmel proportions. The rest of the life elements have *exactly* the same proportion of gimmel to 'Triadic Rotational Units of Equivalence' (TRUE) [2; 60], with specific TRUE unit scores of these life-elements based on their mathematical Diophantine equation figures all being multiples of 108^3. Water, too, as a molecule, fits this profile. [2]

Even silicon has these properties, and it should be a life-element. This is very likely correct based on the available data and a finding that directly is now testable: [2; 60] Silicon is a part of the soil which supports elementary agricultural life.[120; 121] In addition, TRUE shows phosphorus though not a life element [122], is a critical energy source. [2] Moreover, applying TDVP and TRUE, we can appreciate why iron which contains the most gimmel of any common element. [123] These findings individually and collectively could be very big breakthroughs with far reaching consequences in the near future. It may clearly distinguish life-elements from non-life elements of the periodic table. [2] The latter ones still are important, though, and might be contributing towards the entropy increase in the atmosphere, in the life supporting system and even act as catalysts. [54; 2] Is this all coincidental? Or could it be part of a Divine design for the universe where exact

amounts are needed for our existence? [15; 16;4] This is dealt with elsewhere but overall is exceedingly important: Effectively, we argue that spirituality and science are not the separate magisteria that Gould conceives of. [124; 125] And we've hypothesized that (unchanged) gimmel reflect catalysts. [3; 4]

TABLE 3B: SUMMARY OF TRUE UNIT ANALYSES OF THE ELEMENTS [123]

Compound	ג Units	Total TRUE	Valence [t]	% ג [u] Units	TRUE Volume	Comments and [v] Abundance rank #
Hydrogen [w]	150	168	**-2+1=-1**	89.3%	$(1x108)^3$	***Critical Element*** [x] **#1**
Helium	256	336	-2+2=0	76.2%	$(2x108)^3$	***Inert Element*** [y] **#2**
Helium Hydride HeH	384	504	+1	76.2%	$(3x108)^3$	***Super acid*** Not found in Nature
Lithium Hydride Li and H2 (Deuterium)	512	672	+2	76.2%	$(4x108)^3$	Rare in Nature Very Reactive
$(He)_2H$ and HeH_3	640	826	+3	76.2%	$(5x108)^3$	Produced in Nuclear Fusion
Carbon	768	1008	-2+6=4	76.2%	$(6x108)^3$	Organic element[z] #4
Nitrogen	896	1176	-2+7=5	76.2%	$(7x108)^3$	Life element #7
Oxygen	1024	1344	-2+8=6	76.2%	$(8x108)^3$	Life element #3
HO or OH H_2N and CH_3	1,174	1,512	-1	77.6%	$(9x108)^3$	Building Block of Amino Acids
Neon	1280	1680	2 – 8 + 10 = 0	76.2%	$(10x108)^3$	Inert element #5
H_2O	**1,324**	1,680	0	78.8%	$(10x108)^3$	Water
H_4N	1,496	1,848	+1	80.9%	$(11x108)^3$	Ammonium Ion
Magnesium	1536	2016	**– 10 +12 = +2**	76.2%	$(12 x108)^3$	Life element #9
C_2H	1,686	2,184	+3	77.2%	$(13x108)^3$	Cysteine Amino Acid component
Silicon	1792	2352	**-10 +14 = +4**	76.2%	$(14x108)^3$	Postulated Life? #8

Instead, they can be unified. Science becomes a component of the spiritual, and the spiritual is importantly applies to science. [9; 126]. This also introduces concepts such as free-will [11] and good and evil [10]. We've listed important technical data in the footnote illustrating a direct refutation, we think, of Nobel Laureate Gell Mann [114] and gluons. Gluons were perceived as glue [4; 112], could Gimmel be spiritual?

4D, 9D and related complex questions Moreover, there are complex questions relating to 9D not 4D

[t] Valence relates to position on the Periodic Table of the Elements. E.g. The first shell has 2, then 8 etc. This differs from 'charge'.
[u] This is the ratio of the gimmel to the TRUE units.
[v] Abundance rank of the different elements in the cosmos: Iron is #6, Sulfur is #10, Argon is #11, Calcium is #12.
[w] This analysis is on Hydrogen 1, not isotopes like heavy deuterium H2 or H3 tritium, though these have also been analyzed.
[x] Hydrogen is unique without a neutron and therefore with 'daled' vertically ד has much more gimmel : 38 for daled (0 MEUs). 150/168 = 89.2%. Volumetrically 108^3 = 1,259,712. Hydrogen is the highest gimmel proportion then the life elements.
[y] Gimmel : 105 for 1 electron (1 mass/energy unit MEU), 7 for 1 proton (17 MEUs), and neutrons are 16 for gimmel; 22 MEUs).
[z] The most common elements of life and abundant ones are all at 76.2% = C, O, N, S, P, Ca, Mg; also He, Ne inert. All + H = 108^3.

science: [aa] [bb]

- Why is it absolutely necessary to have a 9-dimensional finite existence (which *contains* the 3S-1t physical reality we experience) and why it is absolutely necessary for there to be a massless, energy less third component for a stable reality?
- And how one can prove that the mass-energy volumetric equivalence in the normalized 9D reality with this third component is exactly equal to the data in the CERN Large Hadron Collider?
- Why is the observable reality basically discrete in nature and not continuous?
- When is another calculus of distinctions (not Newtonian) applicable?
- How can we extend science beyond Popperian falsification? When would that be applicable and how is it done today? [83; 84]
- What kind of mind-body model that is *not* separating mind from body and is *not* just *an emergent property of the neural system component* can exist*?*
- We must explain other conundrums like Heisenberg's uncertainty principle, so-called wave-particle duality, and the origin of the Universe (the 'event horizon').
- Many studies now recognize the observer has to be an active entity. For example, the role of the observer is important and well-established in quantum physics, and cannot be ignored. [127; 128; 129] Our experiences vary as observation is *relative* [17] to the *framework* of the observer, and these variations recognize reality differently. [61; 130; 131]
- And possibly most important: How does spirituality apply to the broader 9-dimensional quantized (little bits; pixilated; discrete) finite existence?
- Is that broader finite, with covert (dimensions 5-9) and overt (dimensions 1-4; largely our physical 3S-1t experience) embedded within an infinite, perhaps divine continuity?

Again, we can largely solve all these questions, applying 9D science. We certainly do not know all. Ours is an ongoing exploration, so let's finish this section pointing out our limitations (we cite verbatim from a previous publication by Neppe and Close) [9].

Acknowledgement of a Greater Reality:

This is told in all humility. In this paper, we present some remarkable findings. We refer to some of our work with sincere meekness. Below, you will read about colleagues who have studied our findings in detail, and regard them as more than groundbreaking, even paradigm-shattering. However, what has guided us? *We don't for a moment think this important shift from the current paradigm of scientific materialism to the realization that reality is consciousness-based and spiritually driven are purely our own independent contributions. We know that, for us, it is the result of accessing higher consciousness realities. But you, the reader, must choose.*

Could it be that the findings below might be considered remarkable—in the sense of following the laws of nature but in accordance with reality higher than our usual physical 3 dimensions of space in one moment in

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[aa] Hydroxyl / hydroxide is OH is major component of water and building block of amino acids. H_2N is common in amino acids; CH_3 is a common organic compound radical.

[bb] With *all the life-elements*, for example, the atomic cube remarkably *always equals* 125,971,200y^3. Therefore, the cube root =108y. This means that adding gimmel, the figure is always an integer: This figure consistently reflects *all the stable elements of life* with integral quantities of protons, neutrons and electrons. However, such solutions would be impossible without the addition of six consistent different derived amounts of *gimmel TRUE units* (2, 4, 1 with quarks in protons; 5, 3, 6 for quarks in neutrons) in union with the (stable) 3 up-quarks (2 up in protons) and 3 down-quarks (1 up in neutrons); however, the further much larger amount (105 gimmel units) in the electrons, allows the specific elements to exist with *quantized volumetric stability.* This also, in part, explains *the Periodic Table Of The Elements.* Gimmel, specifically, allows our universe to exist: without it, the atoms would fly away. In effect, gimmel with specific GTUs provides stability; gluons cannot provide such stability.

time—the present?
Are these telepathic insights from one mind? Are there guiding elements here?
Is it purely us, or guidance? G-d? Could this be the creative spiritual expression of science at work?

Again we quote Arthur Koestler [132]:

"The real achievement in discoveries... is seeing an analogy where no one saw one before... The essence of discovery is that unlikely marriage of cabbages and kings — of previously unrelated frames of reference or universes of discourse — whose union will solve the previously insoluble problem." He further adds:… *The principle mark of genius is not perfection but originality—the opening of new frontiers."*

In our opinion, in Dimensional Biopsychophysics [133; 134], there needs to be an extra component. Not only the insightful discovery, but the proof, and much of that should be mathematical. We believe, we have demonstrated this math requirement, at least coherently, and to an extensive degree enough to make a difference for almost every one of the questions above. That is exciting.

We can usually prove the hypothesis; and when we cannot, we can logically speculate, and then use that logic, fitting the pieces into the appropriate part of the jigsaw puzzle, and using that as the scientifically feasible jumping point for further studies. We've listed important technical data in the footnote.[cc]

The conventionally trained scientists and those who are specifically aware of Dimensional Biopsychophysics: How to explain the challenges. Section 4.

Vernon M. Neppe MD, PhD, FRSSAf, DPCP(ECAO), DSPE and Edward R. Close PhD, PE, DF(ECAO), DSPE.

Abstract*: We demonstrate examples of TDVP model. The recent X17 discovery may be better explained by TDVP. We provide further appreciation of why TDVP works. Who are the incorrect ones? The 4D physicists or the Dimensional Biopsychophysicists examining 9D?*

There remain still the cynics or effectively a small number of scientists variably 'deniers' who do not like to extend changes to the Standard Model of Physics, about the TDVP model that "just cannot be

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[cc] With gluons, where y is an integer reflecting the number of protons, in, for example, any 'life elements', the calculations reflect exactly the cube root of $68{,}697y^3 = 40.995338y$ (that's not an integer). This contrasts with applying gimmel in the derived TDVP TRUE mathematical calculations: In this instance, there is a necessary third subatomic particle —electrons—and that means that with a necessary addition of a specific finite quantity in union with all the neptrons (protons, neutrons, electrons) there would be a small number of solutions in these cubes.

That specific quantity reflects gimmel: With *all the life-elements*, for example, the atomic cube remarkably *always equals* $125{,}971{,}200y^3$. Therefore, the cube root =108y. This means that adding gimmel, the figure is always an integer:

This figure consistently reflects *all the stable elements of life* with integral quantities of protons, neutrons and electrons. However, such solutions would be impossible without the addition of six consistent different derived amounts of *gimmel TRUE units* (2, 4, 1 with quarks in protons; 5, 3, 6 for quarks in neutrons) in union with the (stable) 3 up-quarks (2 up in protons) and 3 down-quarks (1 up in neutrons); however, the further much larger amount (105 gimmel units) in the electrons, allows the specific elements to exist with *quantized volumetric stability.* This also, in part, explains *the Periodic Table Of The Elements*. Gimmel, specifically, allows our universe to exist: without it, the atoms would fly away. In effect, gimmel with specific GTUs provides stability; gluons cannot provide such stability.

correct", or the misguided who have been influenced by others or are just ignorant of their own ignorance. [dd] [135] *We encourage open-minded and well-considered skepticism.* That helps us in further developing our ideas more, explaining the difficulties skeptics point out, and to understand the limitations of our own models. This does not necessarily mean we are correct, but at this point in time, our model has not been refuted, and instead, has continued to be amplified with other proven hypotheses or with scientifically verifiable information. With respect, these adverse, unfounded comments reflect on the cynics, not on our work. However, these critics may extend beyond just materialistic denial, to other negative emotions or thoughts that include jealousy, incredulity, ignorance, resentment, misinformation, or perhaps even malice. *Our TDVP discoveries are threatening to those who have grown up and been trained only in 4D-science.*

We are fortunate that there are now 4 different major scientists in the disciplines of Dimensional Biopsychophysics or Particle Physics in 3 countries who've studied our TDVP work intensively. They are highly qualified and have publicly declared that, based on their critical evaluations, they want to nominate us (Ed Close and Vernon Neppe) for the most major scientific prize. They all may be wrong, and certainly corrections historically are not unusual in science, but their conclusions suggest support for our work. We are concerned, however, that the 4D scientists at the major university of this individual may not understand the full extent of our work: Have they studied our broader writings or Dimensional Biopsychophysics? Despite remarkable 4D science qualifications, are they yet 9D scientists? With due respect, that makes a major difference.

We answer some key critiques of detail later. But meanwhile let's target some basics: Direct responses to critiques:

- **1. "*The Cabibbo mixing angle calculation is not rigorous enough".***

As background, the Cabibbo mixing angle refers to an esoteric angle in particle physics. Prior to our work, no-one had been able to derive its size. Many scientists over fifty years had unsuccessfully attempted to solve why it was the size it was: No-one could understand why it had to be the strange size of 13. 04 degrees. [136; 137; 138; 139]

The Cabibbo angle was not solved because, with respect, it required a 9D model to solve. This was our first definitive 9D TDVP derivation. Thereafter we were able to replicate the 9D idea repeatedly [140] with several other derivations. [46; 141; 142; 143]

- ***2. Is it the fifth dimension X17 particle or our 9D TDVP model?*** [1]

We definitively proved mathematically the 9-dimensional spin model through that careful derivation of the Cabibbo Mixing angle. [144] But this has been largely ignored. We've challenged some recent findings that we published as follows in a multi-peer reviewed physics journal.
On 23 November 2019, the popular press excitedly reported research from Physicist Attila Krasznahorkay and colleagues at the Hungarian Academy of Sciences about the *"fifth law of physical forces supporting the existence of a hypothetical X17 particle."* [145] This *"connects our visible world with the dark matter".*

[dd] The term pseudoskeptic refers to someone who does not use scientific methods but instead rejects a discipline or information based on their prejudices. We have at one point applied the term 'scoffer' that Prof. Stan Krippner, PhD, possibly the most eminent living Humanistic Psychologist, suggested as a non-offensive term for use by colleagues. Professor Marcello Truzzi initiated the term 'scoffer' . Marcello Truzzi (September 6, 1935 – February 2, 2003) was a professor of sociology at New College of Florida and later at Eastern Michigan University, founding co-chairman of the Committee for the Scientific Investigation of Claims of the Paranormal (CSICOP), a founder of the Society for Scientific Exploration "In their most extreme form, scoffers represent a form of quasi-religious Scientism that treats minority or deviant viewpoints in science as …"
We all need to be cynical and skeptical and these terms are used as required here. Krippner's 'counter-advocate' term has had mixed receptions so is not here used. We also have used 'denier', but some might even be innocently unaware of the limits of their analyses. We welcome open-minded skepticism though: That way the true scientist who is appropriately trained carefully analyses the broader context of data. In this paper, we do not want to sound derisive as it's not its intention and the historic use of the term could have been interpreted by some in a disdainful tone so we have eliminated it from this paper.

Jonathan Feng, a professor of physics and astronomy at the University of California at Irvine, pointed out that *"if it were true, it would be a Nobel no-brainer"*. [146]
However, with respect, we propose that the idea of a fifth force—after electromagnetism, the strong and weak forces, and gravitation—is unnecessary. We argue that these researchers have detected the effects of gimmel [3; 24; 105] and the 9-dimensional (9D) matrix. [8; 123; 147] The Krasznahorkay et al findings relate to a new discovery they've called 'X17' and this is regarded as reflecting a new 'force' relating to the Krasznahorkay et al research proof [145] based on particles coming off beryllium-8 at around a 140-degree angle. This was 'strange and new'. Their previous work was with Helium where a 115-degree angle was also unexplained. *"They're leading us closer to what's considered the Holy Grail in physics, which Albert Einstein had pursued but never achieved"*. [145] That quotation is true: Einstein spent the last two decades of his life trying to find in effect extra dimensions but ignored the volumetric nature of rotating elementary particles (just as Planck had done, as well), 9-dimensions specifically, and gimmel. [8; 123; 147; 148; 149; 150] But the *"they're"* may refer to others.
This is so because the proven, though not well-known, features of 9D and gimmel have simply not been considered, yet appear to explain these Hungarian findings better than a new unexplained 'fifth force', that might imply even a sixth or seventh force or more according to Dr. Feng [146]. Moreover, 9D [151] and gimmel [2; 3; 4] have profound empirical and math explanatory support.

We illustrate this point with a critically important Cabibbo aside: *We mathematically proved the calculation of why the Cabibbo Mixing angle was 13.04 ± 0.05 degrees*. *This was the first major finding initially demonstrating the necessity of a 9-dimensional quantized finite model.* That proof was only demonstrable through a 9-dimensional mathematical derivation, providing the reason why no-one before that time (2014) had been able to do that calculation because they had worked only with 3S-1t [152, 144] or possibly with unsubstantiated theories of multidimensionality like string and superstrings, which remain unproven and might be incorrect, despite at least allowing some ten thousand scientists seriously contemplating such multidimensional realities. [55; 56; 57; 58; 153]

- ***3. "Why use 9 dimensions not 12? The math must be irrelevant or contrived."***

Why not just choose 12 dimensions and find something unrelated that 'proves' it? The reason is that the math requires specifically 9 finite dimensions or an exponent of 9.

Let's now objectively answer some critiques scientifically:

- It is a *fact* that, based on empirical mathematical data, there *are* nine rotating dimensions (or maybe exponents like 81) in finite reality: Period. Every major finding in TDVP began by applying logic and possibly some creativity, and we have indicated, the 9-dimensional finite rotating model is now definitive and mathematically proven: Moreover, the math is easy to prove. Whether we like it or not, we are dealing mathematically with a 9D quantized finite reality, and that reflects our *finite existence*: the 4D 3S-1t physical reality we *experience* is simply the *overt* component that is expressed to us during our physical existence. The remaining dimensions are *covert*.
- It is further a *fact* that based on examining data in the protons, neutrons and electrons of each and every element, for example, they cannot mathematically exist within stable atoms, unless an extra component is added—this is that additional aspect, 'gimmel'. Without it, the mathematics of the atom would be such that we would have only a fractional proportion of the atom, not the whole atom. That cannot be, because, by definition, the atom must be integral. There is something missing and that something, gimmel, can be applied by mathematical 9D science not through 4D science.
- It is a *fact that 9D is highly relevant to empirical science today.* The only question would be the relevance of 9D science: Could these just be mathematical operators, that are important mathematically, but of no relevance to the real world? Could this math of 9D science not be empirically relevant to real science? No! Our data is unequivocally proven empirically.

- It is a *fact that we now have definitive math proof* linking our Triadic Rotational Units of Equivalence (TRUE) data with gimmel and subatomic particles with the multibillion dollar CERN Large Hadron Collider. [60] The figures *exactly correspond* mathematically. [60; 122; 154] That proves our work is definitely empirically based, our findings are real and necessary, and that includes gimmel. [60] This is why it can no longer just be regarded as a mathematical operator that is irrelevant to our reality. [23; 103; 155] This is our most important discovery culminating in 2018, as this proves that TDVP is not just scientific speculation. [23; 60] Effectively, this implies that gimmel or higher consciousness has been scientifically proven! We challenge anyone, *after appropriate training not just cursory analysis,* to refute this data and specifically to show the mathematics is incorrect.
- Moreover, our cosmological data is apparently also correct: The Hubble 'dark matter—dark energy' data [156; 157; 158; 159] amazingly correlates at the <1 in 1250 level with TRUE data! [105] To boot, we've shown that Dark matter-Dark energy further correlates strongly with quantal atomic studies. [28] With great respect, the facts are against 'deniers'. Given that we've demonstrated that TDVP is not just a 'theory' (like string theory is), but based empirically on fact at all of the quantal, macroreality and cosmological levels, it might now be incorrect to call TDVP a likely *'Theory of Everything (TOE)*', but a *'Description of Everything' (DOE)'*! Nevertheless, we dislike the term 'TOE', as we haven't yet described, for example, Quantum Gravity or Unifying the Laws of Physics. So we'll stick with 'metaparadigm'!
- *What about if the angle is not necessarily 120 degrees (or another number)? (in other words, let's find the irrelevant or unimportant to refute the whole lot!)*
    - Sometimes there are small problems which don't explain the broader picture. This example illustrates the unwarranted extended conclusion by analogy: Metaphorically, miskicking a ball a half an inch instead of the full 100 yards of a field should not prioritize that miskick into regarding the whole field as faulty. [160]
    - Clearly, we should maintain priorities and perspectives in conclusions and we must make appropriate justified conclusions from specific examples. Refutation requires testing a relevant hypothesis fundamental to a model or applying other logic for new ideas. We must obtain a proper perspective of the relevance of a single grain of sand in a vast beach. We must avoid taking something out of context:
    - It's like *"this isn't correct, so everything else is wrong: let's find one little component —a prick on the finger—we don't agree with and then slay the whole dragon"*.

Metaphorically, we must look at the whole picture. The whole field and the whole dragon. One reader stated: *"I intuited your 9D work must be wrong, because I 'see' everything 3-dimensionally"*. Ironically, 9D science involves 3D volumetric phenomena.

- **6. *"I will ask my Professor of Physics. He must be an expert?" A caution.***

"I will send the article to my Professor. He will decide the value of this work."

This is a common and apparently appropriate comment, but it's worth a cautionary note. To be even a top-class academic Professor of Physics in 4D science, who may or may not be super-specialized, does not make one a Dimensional Biopsychophysicist in 9D science. Even the greatest 4D physicist is not necessarily capable of expressing an appropriate opinion on TDVP until educated in the area: *The most respected 4D scientists may not even recognize their limitations in studying and evaluating the multidisciplinary* TDVP data or other proposed theories of everything. Effectively, different expertise may be needed to study 9D+.

- A pertinent example here of such new thinking is the new 9D+ discipline that we (Neppe and Close) have called 'Dimensional Biopsychophysics' (DBP) because it incorporates physics and chemistry certainly, but also consciousness research [2; 29; 75; 106; 130; 161; 162; 163; 164; 165; 166; 167], dimensionometry and extra dimensions [133; 151; 168; 169; 170; 171; 172; 173; 174], mathematics [6; 175; 176; 177; 178; 179; 180] and particularly Edward Close's the 'calculus of dimensional distinctions' [17; 19; 20; 60; 181 182], plus the biological, medical and the psychological sciences [183; 184; 185; 186]. Add to this the many philosophical,

mystical and spiritual, [9 42; 82; 187; 188; 189; 190; 191] disciplines and the interdisciplinary challenge is formidable. We believe that effective mastering of TDVP fully requires the minimum *equivalent* of an extended, high-intensity Master's or Doctoral interdisciplinary program in these several specialities.

- **Who are the incorrect ones?**
  With great respect, we are left wondering who the incorrect scientists are? Are they the non-creative classically trained individuals who have rejected the new? Or are they us (Close and Neppe)? Let's revisit again: With respect, we pointed to the fish that fell through Eddington's metaphoric net.[42] We recognized there's more to reality than 3S-1t. *What metaphoric fish were discovered? Essentially 9D and 9D+ (with infinity)*: After 10+ years, no essential, fundamental or key component of our TDVP model has been refuted. This is very unusual in science, particularly today. Instead, with each finding the TDVP model grows stronger. We hypothesize, test, and confirm: It's like putting gloves onto many hands; each time they fit. This may not be too surprising, because the fundamental axioms on which TDVP are based appear to be correct, so the logic and discoveries follow. The jigsaw puzzle pieces continue to fit: With respect, that suggests something real.

The landmark justifications of change: Exploring our most recent findings (to 2021). Section 5.

Vernon M. Neppe MD, PhD, FRSSAf, DPCP(ECAO), DSPE and Edward R. Close PhD, PE, DF(ECAO), DSPE.

***Abstract**: We introduce the concepts of gimmel and particle stability. The rotations of particles may be game changing. And these require the new paradigm of gimmel and 9D.*

Even though Neppe and Close cogently argue they are correct, let them prove it: That's now easy. The TDVP justification is our demonstrated Mass-energy equivalence normalized data in the CERN Large Hadron Collider paper combined with another ostensible landmark paper, our integration and possibly the first unification of the magisteria of spirituality with science. [9; 126] These make an important 2018 duet, though many key features developed far earlier, [135-137] and both were works in progress over many years [9] (see VernonNeppe.org/presents). This may be more than a parallel theme. Ultimately, we perceive these fundamental components of science as integrated with spirituality. [9; 126; 192]

- The Neppe-Close TDVP research is, with respect, *the* extraordinary game-changer. It might describe the missing links: A key, important landmark discovery is 'gimmel', the massless, energyless, third component of reality, that may be key to science in both 9D and the infinite.
- **Gimmel in the 9D finite:** Gimmel is in *necessary union* with all stable particles. But for Gimmel to make sense in the finite reality, it must be in the nine-dimensional quantized reality context. [2; 24; 25; 26; 27; 28; 101; 104; 105; 110] The concept of gimmel appears to have changed the nature of stable particles [113] because these subatomic particles can exist for extended periods: The proton [154], for example, apparently has existed in stable form for as long as the age of the universe! [23; 60; 160; 193] Gimmel has allowed us to understand the need that was *created for stability of particles.* Conversely, the insufficiency of gimmel may be the major reason why the vast number of mathematically unstable, ephemeral particles exist just for 'moments' (such as 10^{-7} to -

[21] second) [47] in the so-called 'particle soup'[194; 195]: The hypothesized particles in the soup appear unstable because mathematically there is insufficient balancing gimmel.

- We speculate that gimmel may not only reflect a finite measurable mathematical quantitative *extent*, but a non-quantifiable, infinitely linked *content* quality reflecting some kind of consciousness equivalence. [17; 19; 20; 60; 181] Gimmel *impacts* everything and that allows *dynamic, interactive functioning* with all of finite physical reality. Gimmel *may be a necessary though not sufficient* requirement for permanence at every level of nature (some mass-energy facts may exist, too).
- There is also now profound data suggesting that there is a proven quantal 'consciousness'. We call this is a necessary and ubiquitous third component to reality—an extra massless energyless component—'gimmel' . Gimmel exists in relation to all matter. Without gimmel, no stable particle can exist for more than microseconds. We understand the mathematical 'operations' of the life-elements which contain more gimmel: Most definitively, in this paper we show that when examining normalized data from the gimmel TRUE unit Mass-energy equivalence scores (GTUs) and comparing these with the CERN Large Hadron Collider, they both are exactly equal integrally with the normalized electron score as 1, and the proton as 1836 and the neutron a 1839. This proves this component of our Triadic Dimensional Vortical Paradigm data is correct empirically in exact quantities) than other elements.

- **Gimmel in the infinite: Ordropy, life and the conservation of mass, energy and gimmel:**
- Reference to the *'infinite'* is very important in 9D+: 'Stability' as described in subatomic particles might still reflect a *finite*, time-limited, but extended impermanence. But at the *infinite* continuity level, the term 'stability' appears insufficient, because *gimmel provides an infinite endurance that would persist forever,* as reflected in our recently verbalized *'Law of Conservation of Mass, Energy and Gimmel'*. [60; 122; 154; 61] This never-ending conservation links strongly with our concept of *'ordropy'* [54 62; 63; 64; 66; 106; 107; 108] — *the tendency to infinite order that impacts* that continually impacts the finite at *every finite dimensional level*. We've postulated ordropy arises from the infinite, and impacts the gimmel the finite, through gimmel. Importantly, our finite physical 4D life and our infinite immortality reflect fundamental ordropic properties. Yet, gimmel is necessary but not sufficient: [60; 122; 154; 61] Any impermanence of subatomic particles results from the subatomic particles themselves, e.g., the short half-life of the free neutron (<5 minutes). [154; 160; 196; 197; 198; 199] Gimmel is intimately linked with a broader, ubiquitous consciousness *radically reshaping science with spirituality, and* reflecting the highest levels of the mystical, adherence to the fundamental Laws of Nature.[133]

Jumping to the covert dimensional domains

Neppe has cogently emphasized these and related insights.

> *"To the conventionally trained scientist, anything which does not fall into our overt physical four dimensional domain experience (three of space within a single time dimension) does not exist. It is consequently treated as 'unscientific', 'absurd pseudoscience', or 'speculative metaphysics' or 'third-rate mysticism'. The truth is just the opposite: Recognizing the true compass of feasible reality allows the real scientist to easily mathematically solve puzzling paradoxes and to empirically appreciate unexplained conundrums. This includes understanding the covert extra dimensional expressions that the finite 5th to 9th dimensional domains allow for—consciousness, spirituality, and the further extra two dimensions of time. Moreover, these materialistic scientists must also recognize the infinite, too."* [200]

4D science is contained in the 9D science

Everything we've learnt in the macro-world particularly is included in TDVP: Our physical reality is well-substantiated through the TDVP model. This reflects 4D science. But that is a part of 9D+ science. Moreover, we

must recognize that despite physics Nobel Laureate Richard Feynman, the layperson's physicist, popularizing that we must accept that quantum physics is weird as the norm [78] that in 9D science quantum physics as well as cosmology is not weird anymore and actually obeys the same laws of nature as our macrophysical laws that we've applied in physics.

John Wheeler's suggestions for research:

The great theoretical physicist, John Wheeler PhD (Feynman's PhD supervisor) recognized this likelihood several times [201]:

- In any field, find the *strangest thing* and then explore it.
- In order to more fully understand this reality, we must take into account *other dimensions* of a broader reality.
- Everything must be based on a *simple idea*. And it is my opinion that this idea, once we have finally discovered it, will be so compelling, so beautiful, that we will say to one another, yes, how could it have been any different? (Or the variant) Behind it all is surely an idea so simple, so beautiful, that *when we grasp it*—in a decade, a century, or a millennium—we will all say to each other, how could it have been otherwise? How could we have been so stupid?

Applying John Wheeler's research suggestions:

And so, with great respect, Wheeler's quotes are apposite. We've discovered solutions to the strangest things. We've increased to other dimensions. We've applied a *simple idea*: We've *grasped* that shift from 4D science to 9D science, and our colleagues should have, too: We've applied simple ideas with normalization of volumes of quantum particles. And suddenly conundrums like quantum weirdness, and dark matter and dark energy [28; 105], and even entanglement [54; 202], non-locality [130] and psi [29; 31], infinity [108; 133] and even spirituality [9] and consciousness [2], and possibly even relativity and quantum mechanics [203] become easy to understand. And we now have one unified law of nature [28; 54; 105] not many: We have united the quantum, macrophysics and cosmology.

Moving from 4D to 9D science?

This should be so exciting for the 4D-scientist who finally will become 9D scientists. However, strangely, Eddington's *"bah"* still seems to apply [42]. Yet, it's all comprehensible and easy. *The mathematics is there and we have put it there for anyone to look and see.*

Yet, do we really still need those Planckian funerals [90]? That would be unfortunate.

Do old habits really need to die out, even if they are obviously wrong? 4D scientist: please answer!

Our physical reality of 3S-1t that we experience, allows us to live our lives knowing there is predictable and often replicable order. However, TDVP also recognizes particularly those Standard Model of Physics limitations in quantum physics and cosmology and extends those. It also explains a large number of other conundrums and fortunately demonstrates the mathematical bases to many of those because they require 9D+ not 4D science.

4D science may still be applicable in our Triadic Dimensional Vortical Paradigm. *TDVP recognizes experiences in our limited perspectives of 3S-1t certainly, but it also allows us to integrate with our broader existence that is impacting us all the time.* However, 4D is insufficient to solve many questions: In Part 1 of this paper, we alluded to the more than 50 conundrums, mysteries and contradictions that the Standard (reductionist 3S-1t) Model of Physics simply cannot answer. This appears to be because they're not in 4D science: They go beyond 3S-1t. Instead, the solutions to these conundrums can be found, in part or in whole, in 9D or 9D+ science. [204] They then become scientifically feasible. [34; 100] We need to still apply 3S-1t models at times, and this is a reason why some solutions can only be in part. We can only apply our 9D+ jigsaw puzzle from the framework of our 3S-1t awareness. [14; 44; 81; 82] At times, the application of suitable 9D mathematics such as the Calculus of Dimensional Distinctions [17; 19; 20; 60; 181] facilitates significant resolution.

An aside: We understand there are over a thousand full-time scientists studying areas relating to the String Theories [56]: With respect, their research has gone nowhere simply because the concept is based on false premises (e.g., no vortices, no consciousness, no infinity, not volumetric, no 9-D, no triads). Would it not be wonderful if some of

these esteemed researchers would instead join Vernon Neppe and Edward Close in an endeavor that is ostensibly correct and is a critically important fertile discipline that can generate over six hundred testable hypotheses for future PhD degrees? [54]

Consciousness Research is so multidisciplinary that few scientists have been able to allocate even as much time to study this area as they would to a regular bachelor's degree in a recognized university discipline like physics.

Science is now subject to anonymous peer-review, yet this *"does not shield people from being jealous, opportunistic, self-serving, incredulous, or harboring idiosyncratic beliefs, nor does it ensure competence or ethical behavior."* [205] We could add 'ignorance of ignorance.'

Objective interpretation is, indeed, a problem for all these reasons:
Acceptance of the new, may result in threats to current thought, and rejection may even result in misappropriation of ideas—we've seen referees publish data instead.
Also, acceptance of radical ideas might lead to rejection of the current University paradigm.
Even in science, the new is dangerous and the expectation is to 'toe the line'. Recognition in science, like all endeavors today, frequently has significant political innuendoes.

In our humble opinion, the data is cogent that 4D scientists applying the reductionist model of physics should extend their studies to the whole picture including details about 9D science or even 9D+ science. TDVP has been a game-changer.
We should be at the stage of Level 10 of 11 NCR of Neppe and Close. This should correspond with Kuhn's Stage 3 of Scientific Revolutions. [15; 71; 206]
The 4D scientists should apply 9D science particularly in the quantal and cosmological disciplines where there are many insoluble 4D level conundrums, but they will not need to reject the great findings of our 4D physical macroworld. 4D remains an extraordinarily important part of the 9D picture, but not the whole terrain. Extending conventional scientific materialism from 3S-1t to learning about 9D+ science is very logical and should not be controversial: 9D is not a speculation, but is based on cogent and reproducible and empirically relevant mathematics.

Moving towards a 9-dimensional quantized volumetric finite reality applying the mathematics of a quantum calculus: Part 2.

Intelligence, Reality and Truth: Resolving the dilemma? Section 6.

Edward R. Close PhD, PE, DF(ECAO), DSPE and
Vernon M. Neppe MD, PhD, FRSSAf, DPCP(ECAO), DSPE

Abstract: *We approach what truth and reality might mean in our ostensibly limited finite 3S-1t reality.*

The human intellect is finite, self-referential, devotedly self-centered, and its own best friend and worst enemy. Sometimes it obscures more than it illuminates, and Its most devious activity, which it even hides from itself, is the continuous frantic shoring up of the delusional belief that the real world is consistent with its carefully created conceptual view of itself and reality. The more intelligent and logically efficient the individual human mind, the more insidious this self-deception becomes. [207]

Each of us has developed or adopted our own conceptual model of reality that seems to us to be very real. However, an individual conceptual model existing in the mind, even if internally consistent, is often found to be inconsistent with the conceptual models of others, and it is very unlikely that any of them are entirely consistent with reality. With a limited correspondence to reality, our views of the world are more or less manageable finite models of reality, existing only within our skulls. But, because we each believe that our own conceptual model is actually reality itself, we build up all sorts of walls of internally consistent logic to protect it from the intrusive influence of any other world view that might conflict with it, and even from actual, existing reality. To the extent that an individual's mental world appears to coincide with the consensus worldview of the society in which he or she resides, even though that consensus is also very unlikely to coincide with reality as it actually exists, that individual is considered to be reasonably sane and knowledgeable. [207]

At this point in human history, most of us tire quite early in life, of having to work to find truth for ourselves. This makes us very vulnerable to the influences of ready-made imaginary conceptual consensus worldviews created by various political, religious, and educational organizations whose leaders seek to control us under the pretense that they are more enlightened than we are, or that their beliefs are truths revealed by someone who is, or was, more enlightened and aware of the nature of reality than we are. [207]

A statement is true, if and only if, it corresponds 100% with reality. That, of course, raises deeper questions: Exactly what is the true nature of reality? As finite physical beings, we are limited. Our consciousness may be capable of operating outside of the physical body and beyond the functions of the brain but not many experience that. Yet, there a growing mountain of solid evidence generated by scientists who have the courage to go beyond the limits of the current mainstream paradigm of materialistic physicalism, despite establishment censorship, but there is also a growing number of people who have had personal experiences of consciousness outside of and beyond the physical body and brain, who are speaking up. This might constitute a real paradigm shift from the assumption that consciousness is an epiphenomenon of physical reality, to a paradigm recognizing consciousness as the organizer of the logical patterns of consciousness in the physical world. Mainstream science generally treats reality as finite, only because their tools of

observation and measurement have a finite range of application. But as we refine the tools and discover more of reality, the finite reality that physical scientists are studying is constantly expanding and changing. This is why science is always incomplete. This is why the history of science shows many examples of radical changes in the body of statements considered to be scientific facts.

Gödel's incompleteness theorems prove that any representation of science as an internally consistent system of logic can never be complete. Thus, all internally consistent logical systems are capable of expansion. In addition, the red shift in light from distant stars indicates that the physical universe also follows this pattern of expansion into the unknown. So, even if a valid model of the physical universe can be said to be finite at any given moment in time, dynamic reality will expand beyond that, in the next instant. The conclusion is that reality must be functionally infinite brings us to a point where we can answer many new questions because effectively one goes beyond the internal consistency and therefore requires an infinite continuity. This implies various questions:

1) What is truth? The answer: 100% correspondence with reality.

- 1a) What is the nature of reality? Answer: Reality is the totality of everything that exists. 1b) Can we ever be aware of reality? Answer: Yes. That is the function of the mind and the senses.
- 1c) Is reality finite or infinite? Answer: Reality is dynamically infinite.
- 1d) Do our thoughts and actions affect dynamic reality, does reality change according to specific discoverable rules, or does it change randomly? Answer: Our actions affect reality, and reality does not appear to change completely randomly, as evidenced by the existence of the many verifiable deterministic laws of physical science.
- 1e) Is consciousness capable of operating outside of the physical body and beyond the electrical and chemical functions of the physical brain? Yes, at least to a limited degree, and perhaps it will behave more and more that way as reality evolves.

2) What is enlightenment? Answer: Awareness and understanding of the nature of reality.

3) Are there various levels of truth and enlightenment? Answer: Yes. Distribution of the levels of enlightenment in individual consciousness beings forms a normal bell-shaped curve, and the body of truthful knowledge expands with the increasing levels of enlightenment.

From a mathematical point of view, when a quantum calculus with a multi-dimensional quantum-equivalence unit and validated Diophantine (quantum integer) theorems are applied to the physics of the proton, as the authors, Dr. Ed Close and Dr. Vernon Neppe have done in TDVP, we find that *there would be no stable atomic structure without the existence of a non-physical form of the substance of reality.* Many papers, several books, and a number of posts have been published detailing this discovery and its implications.

This non-physical feature of reality, which we call gimmel, guides the development of physical reality in an intelligent and purposeful manner. The existence of a Primary Intelligence acting prior to the development of the physical universe is revealed by inductive reasoning, and the existence of a spectrum of conscious enlightened beings operating between Primary Intelligence and human intelligence, is revealed by deductive reasoning. This implies another paradigm shift from the assumption that matter is primary to the realization that consciousness is primary with or without matter and energy.

Why is this important? Because when a new scientific paradigm is introduced, people capable of funding the needed research into its validity naturally ask established scientists to evaluate it. But most scientists who are well-established in the current paradigm, will be totally incapable of evaluating an actual paradigm shift. A recent example of a panel of scientists with training in mathematical physics asked to evaluate TDVP (the Neppe-Close Triadic Dimensional Vortical Paradigm) will serve as an example. [36]

By contrast, a fair number of qualified scientists (who have a background in Dimensional Biopsychophysics) have expressed confidence in TDVP as a real paradigm shift), yet there are several more contradictory examples of circular reasoning on 4D that are easily and glibly offered by mainstream scientists. We (Close and Neppe) [54] and a few other innovative and competent scientists who have reviewed it - are convinced that TDVP, based on the sound experimental data of the Large Hadron Collider [208; 209] with the logic of quantum calculus analysis [1] is a valid paradigm shift from the limited scientific materialism of today's mainstream science, to the broader consciousness-based science of the future. We are definitely not following the road most travelled, even though our new paradigm preserves much of the mainstream paradigm, while expanding it to include consciousness, extra dimensions, and infinite continuity as a unified model. Are we on the path of self-delusion, or enlightenment? It's up to you to decide.

Max Planck pointed out that *"A scientific truth does not triumph by convincing its opponents and making them see the light, but rather because its opponents eventually die, and a new generation grows up that is familiar with it. ... Science progresses from funeral to funeral."* [91] *Effectively, "Truth never triumphs—it's opponents just die out."* [210]

Empirically Verifiable New Approaches To Mass, Quanta, Gimmel, True Units And Calculus: Section 7.

By Edward R. Close, PhD, PE, DSPE, DF(ECA)
Vernon M Neppe MD, PhD, FRS (SAf), DFAPA, DPCP (ECA) DSPE

ABSTRACT [211]

We present nine related concepts producing Empirically verifiable new approaches to Mass, Quanta, Gimmel, TRUE units and Calculus.

We apply the known derivations and formulae of physics including the works of Planck, Einstein and De Broglie.

We introduce the need for applying quanta, discuss the limitations of infinitesimal calculus and introduce a new quantized calculus, the calculus of dimensional distinctions for quantal calculations. We naturalize the most basic parameters of measurement of the objects of the physical universe are mass, energy, space, and time. We emphasize volumetric vortical rotations across multiple axes and that real quantum distinctions can only consist of integer multiples of natural quantum equivalence units. The Calculus of Dimensional Distinctions (CoDD) provides a natural way to describe and analyze the possible combinations and interactions of elementary particles, including the associated phenomena of symmetry, stability, angular momentum and spin. We show that quantally, mass is the combined resistance to acceleration due to the angular momentum and related moments of inertia of the rapidly spinning elementary particles that, in combination, make up an object. Quantum equivalence units(QEU) are introduce. They are not particles but measures of mass, and/or energy. We apply Close's Conveyance Equation and show that integer multiples of quantum equivalence units cannot form a symmetrically stable object (such as a proton) without making

modifications such as adding an extra component, which we call gimmel.
Based on this symmetry and the formulae for rotating vortices, the mass of the proton, neutron, electron, quarks and atom all converted to quantum equivalence units precisely agree with particle physics experimental data. The neutron is particularly complex but can be derived. The use of beta-decay and introduction of positrons and electron neutrinos create a clear way to interchange hydrogen protium without a neutron to and from deuterium that has an electron.
We explain reasons for:
"Surely, hydrogen should be unstable?"
"Why is there more hydrogen?" to begin with.
And "Why does it not have a neutron in it?" And
"Where did the neutron come from, how did it arise?"
"What is purpose of radioactive decay?"

We introduce the law of conservation of TRUE units. Because it's conserved it reflects ordropy. Decay in this context may be a misnomer. We analyze the first 20 elements.
There are patterns with the life elements carbon, oxygen, sulfur, nitrogen, plus magnesium and calcium, plus silicon surprisingly, showing the most gimmel. They have common properties as essential elements in life, plus neon and helium as noble elements.
Hydrogen has far the most gimmel.
*The other elements may be invidious but w*hen used in combination such as phosphate may perform special functions.

Quantum Mathematics For Quantum Reality: Introduction: Section 8.

Edward R. Close, PhD, PE, DSPE, DF(ECA)
Vernon M Neppe MD, PhD, FRS (SAf), DFAPA, DPCP (ECA) DSPE

Summary of this section. [176]
This technical paper presents the derivation of a mathematical system designed for the description and analysis of quantum phenomena. The heuristic patchwork of measurement and calculation techniques borrowed from various fields of academic mathematics currently being used in mainstream physics, is inadequate, and sometimes inappropriate for application to quantum phenomena. Much of the so-called "weirdness" ascribed to quantum physics is due to this improper application of inappropriate mathematical tools. We require a truly quantized calculus, designed for the proper description and analysis of the quantum reality. We use a comprehensive system of quantum calculation derived from Large Hadron Collider data for electrons and up-and down-quarks. This new calculus allows a clearer understanding of electrons and quarks and the sub-atomic, atomic and molecular structure of reality. It also provides a more complete, comprehensive framework for the analysis of quantum phenomena and explains observations that are inexplicable in the current paradigm.

PERSPECTIVE:
This is the first in a series of technical papers presenting the derivation of a mathematical system designed for the description and analysis of quantum phenomena. The argument is made that the heuristic patchwork of measurement and calculation techniques borrowed from various fields of academic mathematics currently being used in mainstream physics, is inadequate, and in some cases inappropriate for application to quantum

phenomena. Much of the so-called "weirdness" ascribed to quantum physics is due to this improper application of inappropriate mathematical tools. A truly quantized calculus, designed for the proper description and analysis of the quantum reality discovered by Max Planck more than 100 years ago, is needed.
The derivation of the appropriate basic quantum equivalence units of a comprehensive system of quantum calculation derived from Large Hadron Collider data for electrons and up-and down-quarks is presented in this paper. Subsequent papers will present the results of applying this quantum calculus designed for quantum reality to problems and paradoxes of the standard model of particle physics.[17; 19; 20]
Applying this new calculus to elementary particles and combinations of elementary particles, we obtain a clearer understanding of electrons and quarks and the sub-atomic, atomic and molecular structure of reality. The use of this system of quantized mathematical logic clears up much of the "quantum weirdness", yields new information about the multi-dimensional nature of reality, and makes the scientific description and analysis of quantum phenomena much more comprehensible and complete. As a result, experimental data that seemed irrelevant become meaningful, and some observations that are inexplicable in the current paradigm, are explained. [2, 4]

Why Is A New Calculus With Quantum Equivalence Units Needed? Section 9.

Edward R. Close, PhD, PE, DSPE, DF(ECA)
Vernon M Neppe MD, PhD, FRS (SAf), DFAPA, DPCP (ECA) DSPE

Abstract:
The infinitesimal calculus is limited when analyzing realities as there is a bottom to such an analysis. Everything is quantized and integral. Consequently, we need to apply a new kind of calculus, the Calculus of Dimensional Distinctions.

Summary of this section. [212]
We exist in a quantized reality governed by the laws of general relativity. In the current scientific paradigm, physical change is modeled successfully by the integral and differential calculus of Newton and Leibniz in Hilbert space. But they're mathematically inappropriate for application to the quantum phenomena as a quantized variable, however, cannot approach zero immeasurably closely. Its approach toward zero must stop at one quantum unit greater than zero because it can have no smaller value in a quantized reality. In quantum physics, this bottom to the descent of variables might occur before the limiting value of the function is reached: Analysis of a quantized reality requires an appropriately quantized mathematical system. Applying the basic equations of quantum physics relating particle and wave phenomena, namely the Planck-Einstein relation $E = h\nu$, mass–energy equivalence $E = mc^2$, the De Broglie wave-particle duality hypothesis $h = (E/c)\lambda$, and De Broglie's equation, $h = p\lambda$ the proportionality constant relating the quantum momentum and wavelength of any and all particles and the quantization of energy implies quantization of mass making it a key factor in the derivation of quantum equivalence units and a TRUE quantum system of mathematical logic. Planck naturalized four universal constants (the gravitational constant, the Boltzmann constant, the Coulomb constant, and the reduced Planck constant), setting them equal to unity defining a system of "natural" equivalence units. Planck and Einstein, pioneered recognition of energy and mass in only quantal unit amounts. In effect, any measurement of space smaller than the wavelength of a particle with minimum mass, i.e. the electron, is meaningless.

Allowing Δx to approach zero, as it must do in Newtonian calculus applications introduces the quantum "weirdness" of pseudo-phenomena like non-quantum, dimensionless and massless particles. In any meaningful representation of the physical universe, all of the basic measurable variables: mass, energy, space, and time, must be quantized, and therefore, Newtonian calculus does not work for quantum phenomena. For the proper analysis of quantized reality, a new calculus is required. This calculus must be a system of quantized mathematical logic based on natural quantum units.

The Need for a New System of Quantum Mathematics

Arguably the most important scientific discovery in modern times is the revelation that we exist in a *quantized* reality governed by the laws of general relativity. And by far the most successful mathematical procedure used by scientists to analyze physical reality is the calculus of Newton and Leibniz. [213; 214] But, mainly *because of its successes*, the fact that Newtonian calculus is mathematically inappropriate for application to the quantum phenomena [19; 215] revealed by Planck [90] and Einstein [216] discoveries has been largely overlooked.

The calculus of Leibniz and Newton has been successfully applied to macro-scale problems involving mass, energy, space, and time for more than 300 years, but it is inappropriate for application at the quantum scale for the following reason: Valid results from the mathematical operations of both differential and integral calculus depend upon the fact that the value of an algebraic function of one or more measurable variables, describing some physical state or process, may approach a limit of definite finite value as one or more of its variables approach zero infinitesimally closely [213 214]. *A quantized variable, however, cannot approach zero immeasurably closely. "Its non-zero approach toward zero must stop at one quantum unit greater than zero because it can have no smaller value in a quantized reality.*

For a function involving quanta, this bottom to the descent of variables may occur before the limiting value of the function is reached, invalidating the result of the differentiation or integration. In macro-scale applications, this is not a problem because the amount of error in the result is on the order of quanta, billions of orders of magnitude below our ability to measure, but with quantum-scale phenomena, the error is significant, and may be larger than the result.

This oversight causes much of the co-called "quantum weirdness" that physicists often talk about [77; 78]. The analysis of a quantized reality requires an appropriately quantized mathematical system. [2] Much of the quantum weirdness goes away when such a system is applied. To derive the appropriate quantum equivalence units, we must start with the basic equations of quantum physics relating particle and wave phenomena.

The Basic Equations Relating Quantum and Wave Phenomena

Max Planck's study of black-body radiation in 1900 [94] led to what in retrospect, is arguably one of the most important scientific discoveries in physics up to that time. It was the discovery that the energy of the light emitted from a super-heated metal, called black-body radiation, occurs *only in exact multiples of a very small unit*. This fact is described mathematically by

$$\mathbf{E} = \boldsymbol{h}\mathbf{v} \qquad \text{Equation (1.)}$$

where **E** = the energy of a photon of a specific wavelength, **v** = the frequency of the wave, and ***h*** = Planck's constant = 6.62607 x10^{-34} J·s. Planck was studying black body radiation to determine why and how the color of the radiation changes with changes in temperature. The fact that the change in the spectrum of *energy* as the color of the source changed from red to white was not continuous, but quantized, was a surprise. [92; 94] Thus, Planck developed his mathematical model which described the quantized change in energy emission or

absorption.

In 1905, Einstein published a groundbreaking paper on *the photoelectric effect*, based on Planck's discovery. Einstein's Nobel-Prize-winning paper [217] explained how some of the energy of a photon of light striking a metal plate is converted into the mass of an electron. The photoelectric effect describes the production of electron flow when light shines on a metal. Light can produce electrons even if its intensity is low, and Einstein proposed that a beam of light is not a wave propagating through space, but rather a collection of discrete wave packets (photons), each with energy $h\nu$. [217]As a result of Einstein's explanation of the photoelectric effect, the equation $\mathbf{E = h\nu}$, describing the quantum nature of energy, became known as the *Planck-Einstein relation*.

One reason Einstein's paper on the photoelectric effect is so important is that it confirms the fact that matter and energy are simply two aspects of the basic essence of the physical universe. Mass is converted to energy and energy is converted to mass, in accordance with the mass-energy equivalence relationship described by

$\mathbf{E = mc^2}$ Equation (2,)

The amount of energy (**E**) per unit mass is calculated as the mass (**m**) multiplied by **c**, the speed of light (***c*** = about 3×10^8m/s) squared. This equation provides the mathematical definition of **mass–energy equivalence**. We see mass being converted to energy all the time. It happens in any form of oxidation, from food being converted to caloric energy in the human body, to a log burning in a fireplace, or in the fusion of Hydrogen atoms in the sun and other stars producing radiant energy, isotopes of Hydrogen and atoms of more complex elements like Helium and Lithium. The reverse process, where energy is converted to mass, is not as common, but it happens in some sub-atomic and cosmological processes.

Einstein's equation expressing the equivalence of energy and mass, $\mathbf{E = mc^2}$ applied to the photon, and solved for **m**, gives us the *mass equivalence* of the photon:

$\mathbf{m = E/c^2}$ Equation (3.)

In 1924, Louis de Broglie had a further important insight that generalized the Planck–Einstein relation, expressed by equation (1.): $\mathbf{E = h\nu}$ [218; 219]. His insight can be explained as follows:
Einstein's relativistic interpretation is based on the fact that the speed of light in a vacuum, **c**, is constant, and the *frequency*, **ν**, of light of a specific color is equal to the speed of light divided by its wavelength, **λ.** This is expressed by

$\mathbf{\nu = c/\lambda}$.Equation (4.)

Substituting for **ν** in equation (1.), we have $\mathbf{E = hc/\lambda}$, and solving for ***h*** yields:

$\mathbf{h = (E/c)\lambda}$. Equation (5.)

This Nobel concept (1929), *De Broglie's generalization of the wave-like behavior of matter,* is known as the de Broglie wave-particle duality hypothesis, a central concept of the theory of 'quantum mechanics'.

And the definition of the linear momentum, **p**, of a moving object is the mass of the object times its velocity, so the momentum of the photon is given by

$\mathbf{p = mc}$ Equation (6.)

Substituting $(\mathbf{E/c^2})$ for **m** from equation (3.) in equation (6.) we get:

$\mathbf{p = (E/c^2)\cdot c \rightarrow p = E/c}$ Equation (7.)
the quantum momentum of the photon. Finally, substituting **p = E/c** into equation (5.), we get:

$\boldsymbol{h = p\lambda}$, Equation (8.)

showing that ***h*** is the proportionality constant between the wavelength of a photon and its momentum which is converted to the mass of an electron in the photoelectric process.

As the product of a photon's momentum, **p**, and wavelength, **v**, Planck's constant, ***h,*** is the quantum unit of action, often referred to as a quantum of "action". De Broglie's insight was that the Planck constant is not just the proportionality constant relating the quantum momentum and wavelength of photons, but that it is the proportionality constant relating the quantum momentum and wavelength of *any and all* particles. This generalization has been consistently proved true, both theoretically and experimentally, in every application of quantum physics, including quantum electrodynamics (QED).

This derivation of De Broglie's equation, $\boldsymbol{h = p\lambda}$, using the Planck-Einstein relation, $\boldsymbol{E = h\nu}$, Einstein's $\mathbf{E = mc^2}$, and the definition of momentum, **p = mc** for the photon, also shows us that *the quantization of energy implies quantization of mass.* This has important implications for the quantization of space and time, *making it a key factor in the derivation of quantum equivalence units and a TRUE quantum system of mathematical logic.*
The derivation of De Broglie's equation above is summarized in Table 9.1 below:

Table 9.1: Summary of the Derivation of De Broglie's Equation Showing the Quantum Equivalence of Mass and Energy for Particle and Wave Phenomena

1. $\mathbf{E = h\nu}$ ***(The Planck-Einstein relation)*** where **E** = the energy of a photon of a specific wavelength, **v** = the frequency of the wave, and ***h*** = Planck's constant = 6.62607 x10^{-34} J·s.
2. $\mathbf{E = mc^2}$ **(*Einstein's mass–energy equivalence*)** where **E** = the energy equivalent of mass, **m** = mass and c = the speed of light in vacuum (**c** = about 3×10^8m/s)
3. $\mathbf{m = E/c^2}$ **(**Solving for the mass equivalence of the *photon* from equation 2)
4. $\mathbf{\nu = c/\lambda}$ **(*The mathematical description of the wave behavior of light)*** where **c** is the constant speed of light, **v** the *frequency* of light of a specific color and **λ** the wavelength of that light
5. $\boldsymbol{h = (E/c)\lambda}$. (Obtained by substituting $\mathbf{\nu = c/\lambda}$ into equation 1 and solving for ***h)***
6. p = mc (The definition of linear momentum)
7. $\mathbf{p = (E/c^2)\cdot c \rightarrow p = E/c \rightarrow E/c = p}$ (substitution of $\mathbf{m = E/c^2}$ from equation 2 into equation 6)
8. $\boldsymbol{\therefore h = p\lambda}$**,** which is **De Broglie's equation (**by substitution of **E/c = p** into equation 5.)

We have established three very important facts:

1. Mass and energy are simply two interchangeable forms of the substance of physical reality,
2. The elementary quanta we call electrons and photons have both particle and wave characteristics and
3. These physical forms and characteristics are mathematically related by well-known laws and simple equations.

The next task before us is to use these facts along with available empirical data from quantum physics experiments to define quantum equivalence units appropriate for the description and analysis of quantum phenomena.

Standard Units of Measurement

The standard units of measurement used in the various branches of science and engineering are arbitrarily chosen, usually for practical reasons, like mitigating calculation problems due to the disparity of scale of the many objects being measured. For example, because of the great disparity in scale between the speed of light (2.99792×10^8 m/s) and $\boldsymbol{h}$ (6.62607×10^{-34} J·s), *Planck chose to "naturalize" the speed of light in the equations by setting* $\boldsymbol{c}$ *equal to unity (*$\boldsymbol{c} = 1$*).* [90; 217] He also naturalized four other universal constants (the gravitational constant, the Boltzmann constant, the Coulomb constant, and the reduced Planck constant), setting them equal to unity to define a system of equivalence units he called *"natural" units*. [220] This system of units is now known as *Planck units*. *Several other systems of natural units have been devised for specific purposes, but none of them are based on naturalization of the basic quantum units of mass, energy, space and time.* [ee]

The fact that measurements of the mass and energy of compound particles in all commonly used units, are non-integer, indicates that the units being used are not truly quantum-based. In a completely naturalized system, with the most basic quantum units set equal to unity, all physical measurements would be integer multiples of those basic quantum units.

For the undistorted representation and analysis of quantized reality, a quantized system of mathematical logic is required. This is an important point if the variables in question are measures of mass or energy, since, due to the work of Planck and Einstein, energy and mass are known to occur only in quantal unit amounts. One may argue, however, that in the most basic cases of the use of Newtonian calculus, the variables assumed to approach zero are space or time variables, and it might seem that space and time can be divided indefinitely. If so, results from the application of the calculus to quantum phenomena when the independent variables are x, y, z or t, would still be appropriate. This argument, however valid it may sound, turns out to be erroneous for the following reasons:

1.) The principle of relativity, leading to Einstein's special and general theories [86; 216], contrasted with the experience of two or more observers moving relative to each other, make it clear that the idea of simultaneous events occurring in a universal space-time that is everywhere the same throughout the universe, is untenable and simply *wrong* [130; 131; 221]. The concept that space-time is an unchanging, uniform background within which events involving mass, energy and conscious observers occur, is a *relative* impression arising from the limitations of our physical senses. [130; 131; 221] As Einstein emphasized in the final note and appendix to his book on relativity, added less than three years before his death, *there is no such thing as empty space or eventless time; space-time does not exist without mass-energy*. [87; 222]

2.) Einstein's focus in Appendix IV: '*Relativity and the problem of space*' [223] was on the structure of the universe as extended mass-energy, looking outward toward the edges of the visible universe. Here, we are looking in the opposite direction, i.e., *inward*. We are dealing with quantum phenomena. Returning to Louis de Broglie's equation, $\boldsymbol{h} = \mathbf{p}\boldsymbol{\lambda}$, [219] and applying this to the elementary particles in the atom: electrons, up-quarks and down-quarks, the wavelength, $\boldsymbol{\lambda}$, is equal to a finite measure of linear space, $\boldsymbol{\Delta x}$, equal to the wave length related to the spinning particle, with a specific angular momentum, $\mathbf{L}$, and momentum, as a function of mass, is quantized. Thus, $\boldsymbol{\Delta x} = \boldsymbol{\lambda} \geq \boldsymbol{\lambda_e}$, and any measurement of space, $\boldsymbol{\Delta x} = \boldsymbol{\lambda}$, smaller than the wavelength $\boldsymbol{\lambda_e}$ of the particle with minimum mass, i.e. the *electron*, is meaningless.

For results of applications of Newton's calculus to changes in space to be valid, $\boldsymbol{\Delta x}$, the measure of distance

[ee] Naturalization" in Mathematical Physics is the process of conversion to natural numbers, usually positive integers, such as the number 1 or any number (such as 3, 12, 432) obtained by adding 1 to it one or more times: a positive integer.]

in space must be assumed to approach zero. Then, at the quantum scale, $\Delta x = \lambda \rightarrow 0$ means that $h = p\lambda \rightarrow 0$, which cannot be true because h is a constant in our quantized reality. *Allowing Δx to approach zero, as it must do in Newtonian calculus applications introduces the quantum "weirdness" of pseudo-phenomena like non-quantum, dimensionless and massless particles.*

3.) Among the three elementary particles that make up ordinary matter, i.e., electrons, up-quarks and down-quarks, the smallest mass is the mass of the *electron*. Therefore, it would be natural to take the mass of the electron as the standard quantum unit of mass. For an electron with kinetic energy of one electron volt (1eV), the De Broglie wavelength, λ_e, is 1239.84 eV nm (Electron Volt Nanometers).
Linear momentum, **p**, is defined as mass times velocity: $\mathbf{p} = \mathbf{mv}$, where velocity, $\mathbf{v} = \Delta x/\Delta t$. [224]

So, for the electron, $\mathbf{p} = \mathbf{m_e}\,\lambda_e/\Delta t$. But we know the electron is spinning, so it also has an *angular momentum, L*. And $\mathbf{L} = \mathbf{I\omega}$ where **I** is the moment of inertia of the spinning particle, and ω is its angular velocity in radians per quantum of time ($rad/\Delta t$). For symmetrically spinning object, $\mathbf{I} = \mathbf{Kmr^2}$, where **r** is the radius of the spinning object and **K** is a constant whose value depends on the geometrical form of the spinning object. For example, for a solid sphere $\mathbf{I} = 2/3\mathbf{mr^2}$, and for a thin disc is $\mathbf{I} = 1/4\mathbf{mr^2}$. Regardless of the actual shape of the electron, *the total momentum of a spinning electron at any given moment in time is the sum of its linear and angular momentum:*

$$\mathbf{P_e + L_e = m_e v + I\omega = m_e\lambda_e/\Delta t + Km_e r_e^2\omega = m_e\lambda_e/\Delta t + Km_e r_e^2\lambda_e./\Delta t.}$$

For the results of an application of Newtonian calculus to changes over time involving an elementary particle like the electron to be valid, Δt must be allowed to approach zero, and mathematically, $\Delta t \rightarrow 0$ implies that its total momentum $\rightarrow \infty$. But *this is a contradiction* since mass is quantized as $\mathbf{m_e}$ and **v** and ω are limited to the finite value **c**.

In any meaningful representation of the physical universe, all of the basic measurable variables: mass, energy, space, and time, must be quantized, and therefore, Newtonian calculus does not work for quantum phenomena. For the proper analysis of quantized reality, a new calculus is required. This calculus must be a system of quantized mathematical logic based on natural quantum units.

Defining The Basic Units Of Quantum Mathematics For A Quantum Calculus: Section 10.

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Summary of this section. [6]
In quantized reality, space-time cannot be divided indefinitely, and therefore it is not actually a continuum. This calls the application of Newtonian differential calculus to functions of variables describing quantum phenomena into question, because continuity is a requirement for a function to have a derivative, and quantization does not reflect continuity but a domain of discrete components. The calculus of Newton and Leibniz is inappropriate for application to quantum-scale phenomena because the variables of mass, energy, space, and time are integral in quantized reality and thus cannot approach zero infinitely closely. The most

basic parameters of measurement of the objects of the physical universe are mass, energy, space, and time. The electron has the smallest mass of the three elementary particles that make up ordinary matter, i.e., electrons, up-quarks and down-quarks. Naturalizing the mass of the electron by setting $m_e = 1$ and converting the masses of the up- and down-quarks to multiples of the unit mass by dividing them by 0.511, we have them equal, to 3.93 and 9.06, respectively or based on Diophantine equations and *normalization* 4 and 9 respectively.

At the quantum level, *the real measure of mass is inertia, not weight.* This is the key to relating mass-energy to space-time in natural quantum equivalence units. We also must *determine the* minimum possible volume of space occupied by the free electron. That will be the *volume of space* we will use *as the quantum equivalent measure of space in our quantum calculus*.

The most basic parameters of measurement of the objects of the physical universe are mass, energy, space, and time. All other quantifiable physical parameters like force, density and acceleration, are derived from, or combinations of these four measurable parameters. The measures of mass and energy, which are different forms of the substance of reality, are expressed in variables of content [54], [ff] while the variables used for measuring space and time are variables of extent [54]. Because time is measured in duration, it can be mathematically equated to extent and included as a *dimension* of the four-dimensional space-time continuum called Minkowski space [225; 226] [225; 226]. Minkowski space-time is defined as continuous, which accommodates Newtonian calculus, but in quantized reality, space-time cannot be divided indefinitely, and therefore it is not actually a continuum. This alone, calls the application of Newtonian differential calculus to functions of variables describing quantum phenomena into question, because continuity is a requirement for a function to have a derivative, and quantization does not reflect continuity but a domain of discrete components. [203; 227] [203; 227] [228] [61; 62; 64; 66; 229]

Mass-Energy Equivalence

Since energy, and consequently mass, is quantized, using the natural unit $\mathbf{c} = 1$ initiates a system of units in which it is possible to create a quantum equivalence unit for mass and energy as follows: If $\mathbf{c} = 1$, then $\mathbf{E = mc^2}$ becomes $\mathbf{E = m}$, and if we naturalize the minimal quanta of mass and energy by setting the mass of the electron $\mathbf{m_e} = 1$, then $\mathbf{E_e = m_e} = 1$, and one unit of mass is equivalent to one unit of energy. As mentioned above, it is logical and quite natural to use the mass of the electron as the unitary quantum measure of mass because among the three elementary particles that make up ordinary matter, i.e., electrons, up-quarks and down-quarks, the electron has the smallest mass. [2; 103] [230] .[gg] The electron mass is one of the most accurately determined values in physics. Rounded to 3 significant figures, and applying the most commonly used units, MEV/c^2, this works out as 0.511 MeV/c^2 (technically this is very close to 0.511 namely 0.5109989461) [231; 232] We can calculate the masses of the proton, neutron, up-quark and down-quark this way. In this paper, we

[ff] Content refers to what is in the container or receptacle of space-time: Mass and Energy are measured in variables of content and are not directly measurable as extent like Space and Time, because the density and flux of mass and energy may vary throughout the volumetric domain of space-time.

[gg] These figures are very close. Given the variations with the Large Hadron Collider, there is no need to justify the slight variations as the figures must be integral and based on Diophantine equations, and there is possible statistical noise. However, there are explanations too: The figure of 3.93 to 4.00 is only a 1.75% difference for the up-quark; and the 0.67% difference with down-quark after naturalizing conversions. Given that particle decay is expected, variations of <2% are acceptable and expected: We know this because the neutron decays into protons and the variation here is about 0.0016% despite the half-life of the neutron being nearly 15 minutes (885.7 seconds average) and the down-quarks (2 in neutrons) being 900 seconds similar to the neutron; with the other quarks (charm and strange being about 10^{-12}) the beta decay is about a nanosecond. We don't have exact figures for the Top and Up Quarks but based on behaviors, the mean lifetime of the up-quark is long and stable; and the top (or 'truth') quark is likely to be a very short third generation decay as we know it decays very rapidly into b, s, and d quarks. We know that the charm quark has about 5% probability of decaying into a down- quark instead of a strange quark, suggesting that this variation is expected and acceptable.

concentrate on the quark calculations.

From the Large Hadron Collider (LHC) [209] data, the estimated mass of the up-quark is 2.01 MeV/c^2 and the estimated mass of the down-quark is 4.63 MeV/c^2 [2] . Naturalizing the mass of the electron by setting $\mathbf{m_e} = 1$ and converting the masses of the up- and down-quarks to multiples of the unit mass by dividing them by 0.511, we have them equal, to 3.93 and 9.06, respectively. [2]

The table below shows the normal processes of quark transformations seen in the decay of hadrons by "weak interaction", with mean lifetimes of the quarks. [39]

TABLE 3.1: Quark transformations during hadron decay. [hh]

Quark	Decay Process	Comment	Mean Lifetime In Seconds
Up (U)	U → D + W*+	In Proton to proton fusion	unknown
Down (D)	D → U + W*-	In Free Neutron decay and Beta-decay	$9x10^2$
Strange (S)	S → U + W*=	S-quark Decay	$1.2x10^{-8}$
Charm (C)	C → S + W*+	C-quark Decay	$1.1x10^{-12}$
Bottom (B)	B → C + W*-	B-quark Decay	$1.3x10^{-12}$
Top (T)	T → B + W*+	hypothetical	unknown

Quarks don't exist as free particles. Consequently, the half-lives of quarks are derived from the half-lives of the compound particles that contain them and can be measured in collider data. This kind of determination was not possible for up-quarks and top-quarks, hence, their half-lives are 'indeterminate'. However, theoretically, up-quarks in protons would have extraordinarily long half-lives, speculatively at the level of 'beyond the age of the universe'. Conversely, the top-quark must have a half-life shorter than any other quarks, speculatively at the level of 'only one or a few quantum time units'.

Recognizing that LHC data are statistical averages that may be influenced minimally by traces of other rapidly decaying particles and applying the fact that mass in a quantized reality must always be integer multiples of the smallest quantum of mass, we normalize them by rounding them to the nearest integer values.

So, we now have the mass of the up-quark $\mathbf{m_u} = \mathbf{4m_e}$ and the mass of the down-quark $\mathbf{m_d} = \mathbf{9m_e}$. *With the quantum unit of measurement of mass defined as* $\boldsymbol{m_e} = 1$*, the masses of the electron, up-quark, and down-quark are* ***1, 4*** *and* ***9*** *quantum units of mass, respectively.* [2]

The up- and down-quarks are the least massive of the quark family. In the LHC, the other, more massive quarks, i.e., the charm-, strange-, top-, and bottom-quarks decay rapidly into up- and down-quarks, [233; 234; 235; 236]and are thus not directly involved in the formation of hadronic matter. For that reason, they are not

[hh] * The W bosons indicated as W* are virtual bosons, existing only within the infinitesimal time frame allowed by the Heisenberg uncertainty principle. The positive boson (W*+) decays to a positron and an electron neutrino, and the negative boson (W*-) to an electron and anti-neutrino. The transformations shown here are the most common for quarks, but there are other, more rare, possibilities; e.g., the charm quark has about 5% probability of decaying into a down quark instead of a strange quark. The most common of the quark transformations are those of the up and down quarks, the main constituents of ordinary atomic nucleons comprised of protons and neutrons.

discussed in any detail in this paper. The only "stable" quarks are up-quarks and down-quarks when they are in combination in protons and neutrons.

In the process of producing a naturalized system of quantum units, so far, we have naturalized the mass of the electron, $\mathbf{m_e} = 1$ and the speed of light, $\mathbf{c} = 1$, and mass-energy equivalence is established by $\mathbf{E = mc^2}$. To define a complete system of *quantum units* to be used in a quantum calculus, we need to determine the magnitudes of the smallest possible quantum units of space and time related to our mass-energy equivalence unit. *Naturalization of those measures will give us a mass-energy, space-time equivalence unit appropriate for use as the basic unit of a natural quantum calculus.*

Space-Time, Mass and Inertia.

To be useful and appropriate, the quantum equivalence units for space and time in our quantum calculus must be mathematically relatable to the quantum equivalence units for mass and energy that we've defined based on the electron. This task becomes less daunting if we make use of some important clues left by the founders of quantum physics and relativity. Planck and Einstein left us two important statements in writing about the nature of matter and space:

Max Planck articulated: *"There is no matter as such,"* [93] and Albert Einstein emphasized: *"The concept of empty space loses its meaning."* [237] These two brilliant physicists, who spent their lives studying matter, energy, space and time, are telling us that the reality we think we encounter every day as solid matter, independently existing in empty space, is an illusion.

But, mainstream physicists and engineers who have come after Einstein and Planck have mostly ignored these declarations. They know that the solidity of matter is an illusion, of course, but still think of physical reality as being made up of little bits of matter whirling around in the vast emptiness of space. That classical concept is the very definition of particle physics. Yet Planck and Einstein had clearly determined that this is not true. How can we relate this knowledge to our efforts to define a mass-energy, space-time equivalence unit appropriate for use as the basic unit of a natural quantum calculus? How do the normalized, natural mass-energy units based on the electron relate to quantized space and time?

The common-sense definition of matter when Planck and Einstein lived was: *"That which has weight and takes up space"*. We might refine this a bit as: *"The substance of physical reality which has mass and occupies space"*. This recognizes the fact that weight is a relative measure, meaningless if taken out of environmental context. A person who weighs 180 pounds on Earth, for example, only weighs about 30 pounds on the moon, and becomes weightless in outer space, but mass, the measure of the inertial resistance to motion of an object, remains the same, as long as the object is at rest relative to the instrument of measurement. So, at the quantum level, *the real measure of mass is inertia, not weight.* Why is this important? The equivalence of inertial mass and gravitational mass was the basic argument used by Einstein for the general postulate of the general theory of relativity [86; 87; 216; 223; 238] and it is also the key to relating mass-energy to space-time in natural quantum equivalence units.

If we take Planck seriously, there is no such thing as matter, and mass is a measure of inertia. But what is inertia? Why do elementary particles have inertia? How is it generated? We know that elementary particles spin, and spin creates inertia [23; 239]. Could elementary particles be spinning fast enough to create all the inertia we detect as mass [23; 239]?

The mathematical relationships between mass, motion, momentum, and inertia are well known, so let's have a look at them and see how they apply to the electron in orbit around the Hydrogen atom and to the free spinning electron when it is stripped from the atom, because this may help to determine the minimum volume

of space occupied by the free electron, which would be the natural measure of space to use as the quantum of space in the quantum calculus.

In quantized reality, there is no such thing as a dimensionless particle, so we can relate the wave length, $\lambda_e = \Delta x$, to the quantum volume of the free spinning electron, and we shall find that Einstein's relativity [203; 216; 223] provides us with the way to do that. But in order to determine the relativistic effects of the spinning of the free electron on its spatial volume, we must first determine the angular momentum of the electron from its angular velocity in orbit. To do that, we need to know the mass of the electron, the velocity, $\mathbf{v_o}$, of the electron in orbit around the Hydrogen atom, and $\mathbf{r_o}$, the radius of the orbit. [203; 216; 223]

De Broglie's equation for the quantum matter wave applied to an electron in orbit around a Hydrogen atom: $\boldsymbol{\lambda_o = h/m_e v_o \sqrt{[1 - v_o/c^2]}}$, where λ_o is wave length associated with the electron, which is also the circumference of the orbit; $\mathbf{m_e}$ is the mass of the electron, $\mathbf{v_o}$ is the velocity of rotation around the atom's nucleus, $\mathbf{c}$ is the speed of light, and $\sqrt{[1 - v_o^2/c^2]}$ is the Lorentz relativistic factor [225; 240] of contraction of the wave length, λ_o due to velocity relative to the observer [225; 240 130; 241]. The electron, as described by the Schrödinger wave equation [242; 243], is not localized within the orbit, but inhabits the entire orbital domain, like a cloud in the shape of spherical shell until it is observed or measured. [140; 244; 245]

In order to calculate $\mathbf{v_o}$, the velocity of the orbiting electron, we will assume that it is a small fraction of $\mathbf{c}$, so that the relativistic adjustment is negligible and the wavelength, $\boldsymbol{\lambda_o \simeq h/m_e v_o}$. (we will test this assumption-later, below).
We can make use of four other well-known simple equations:
1.) $\mathbf{F_o = m_e v_o^2/r_o}$, the outward Centrifugal Force equation ($\mathbf{v_o}$ = tangential orbital velocity, $\mathbf{r_o}$= orbital radius)
2.) $\boldsymbol{\lambda_o = 2\pi r_o}$, the wave length of the electron in orbit
3.) $\mathbf{F_i}$ (inward force) $\mathbf{= (Kq_1\, q_2)/r_o^2}$, Coulomb's equation for the attractive force due to electrical charge, where $\mathbf{q_1}$ is the electron charge and $\mathbf{q_2}$ is the charge on the nucleus of the hydrogen atom.
4.) $\mathbf{E = \tfrac{1}{2}\, m_e v_o^2}$, the classical equation for kinetic energy. [ii]
The SI parameters used in these calculations are defined as follows:
$\mathbf{F}$ = Force in joules, $\mathbf{m_e}$ = the mass of the electron = 9.1094 x10^{-31} kg, $\mathbf{r_o}$ = radius of the electron's orbit in meters, $\mathbf{v_o}$ = orbital velocity in meters per second (m/s), $\boldsymbol{\pi}$ = 3.14159, $\mathbf{E}$ = energy in electron volts (Ev), $\mathbf{q_1 = - q_2}$ = 1.6021 x10^{-19} coulomb, $\boldsymbol{h}$ = Planck's constant = 6.6261 x 10^{-34} joule sec (J·s), $\mathbf{K}$ = Coulomb constant 8.9876 x10^9, and $\mathbf{c}$ = 2.99792x10^8.m/sec.[jj]
Using the first three simple equations above, Planck's constant, the Coulomb constant, the mass and charge of the electron, all measured and validated empirically by generations of experimental physicists, we can test our assumption that *the velocity of the electron encircling the Hydrogen atom is a relatively small fraction of the speed of light* as follows:
Solving **equations (1.)** and **(2.)** for $\mathbf{r_o}$, we have $\mathbf{r_o = m_e v_o^2/F_o}$ and $\mathbf{r_o = \lambda_o/2\pi}$. Then, equating the two expressions for $\mathbf{r_o}$, we have:
$\boldsymbol{\lambda_o/2\pi = m_e v_o^2/F_o \rightarrow F_o = (2\pi m_e v_o^{\,2})/\lambda_o}$ **and** $\boldsymbol{\lambda_o = h/m_e v_o \rightarrow F_o = (2\pi m_e^2\, v_o^3)/h}$ **(4.)**
Also, substituting $\mathbf{r_o^2 = (\lambda_o/2\pi)^2}$ into **equation (3.),** we have:
$\mathbf{F_i = (4\pi^2\, Kq_1\, q_2)/\lambda_o^2}$, and $\boldsymbol{\lambda_o = h/m_e v_o \rightarrow F_i = (4\pi^2\, Kq_1\, q_2\, m_e^2\, v_o^2)/h^2}$ **(5.)**
We can equate the two expressions **(4.)** and **(5.),** for force, because, if the outward centripetal force, $\mathbf{F_o}$, were not exactly equal to the inward attractive force of electrical charge, $\mathbf{F_i}$, the electron would either fly away from the hydrogen atom, or spiral into the nucleus. Setting the expressions for the two forces equal, we have:

[ii] Note: In these calculations, we will use the SI system of units rather than the natural units we are developing. 1.We haven't yet re-defined all of the basic units, and 2.) we can directly compare our results with known empirical results expressed in SI units.
[jj] *Note:* $q_1 = - q_2$ because the charge of the electron, generally considered to be negative, is equal and opposite to the charge of the proton. In the calculations below, the units of measurement applied will be as defined above, but they will not be included in the notations of most of the computations for brevity.

$(2\pi m_e^2 v_o^3)/h = (4\pi^2 K q_1 q_2 m_e^2 v_o^2)/h^2$; cancelling like terms on both sides of the equation, we have $v_o = 2\pi K|q_1 q_2|/h = 2\pi K q_1^2/h$ = [2x(3.14159)x(8.9876x10^9)x(1.6021x10^{-19})^2]/6.6261 x10^{-34}, which simplifies to: $v_o = \mathbf{2.1874x10^6}$ m/s.
This is a tremendous velocity relative to our everyday experience of velocities of moving objects like automobiles or jet planes (it is approximately five thousand times the speed of the fastest commercial jet), but it is only a small fraction of the speed of light (about 0.0073 **c**). The relativistic effects on space and time at this velocity would be determined by applying the factor $\sqrt{[1 - v^2/c^2]} = 0.9997$. Applying this relativistic adjustment to the De Broglie matter-wave equation, we see that the result would be that v_o will be changed by less than the rounding error. Therefore, our beginning assumption that $\lambda_o \simeq h/m_e v_o$ was valid and we can use the value we obtained for v_o: ($v_o = \mathbf{2.1874x10^6}$ m/s).

We can also check this result against empirical measurement as follows: The energy required to free an electron from a hydrogen atom, is measured in high-energy particle physics experiments as **13.595 Ev.** If we calculate the orbital energy of the electron using our result for v_o and the equation relating energy to mass and velocity, we get:
$E = 1/2 m_e v_o^2 = 1/2(9.1094x10^{-31})(2.1874x10^6)^2 = 2.1793x10^{-18}$ joules
And (2.1793x10^{-18} joules)/1.6021x10^{-19} joules per Ev = **13.60 Ev**, in very close agreement with the experimental results of **13.595 Ev** (the ratio of the two is 1.0003677, a negligible difference)
The next step is to see *how the parameters of the electron in orbit translate to the parameters of the free electron and determine the* minimum possible volume of space occupied by the free electron. That will be the *volume of space* we will use *as the quantum equivalent measure of space in our quantum calculus*.

Conservation Of Angular Momentum And Electron Spin: Section 11.

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Summary of this section. [246]
It makes sense to take the minimum possible volume of the free electron as the quantum unit of space. By math and principles, the smallest finite unit of space-time volume is shown as the smallest possible distinction of extent that can be occupied by an *accelerated* spinning object. Through this, we have a rotational unit of mass-energy space-time equivalence as the basic unit of our quantum math. We call this quantum math, the Calculus of Dimensional Distinctions (CoDD). Thus, the mass/energy content and space-time volume of elementary particles are multiples of the unitary quantum equivalence units of the smallest finite distinctions possible in quantized reality. We can consequently determine Natural Quantum Equivalence Units and their Approximate Values in Conventional SI Units. these natural quantum units can be applied to all elementary particles as primary quantum equivalence distinctions for our Calculus of Dimensional Distinctions. No quantized variable can have values between one and zero, and no quantum distinction can consist of less than one quantum equivalence unit. Real quantum distinctions can only consist of integer multiples of natural quantum equivalence units. *The CoDD provides a natural way to describe analyze the possible combinations and interactions of elementary particles, including the associated phenomena of symmetry, stability, angular momentum and spin.* Conservation of angular momentum is demonstrated impressively by a spinning figure skater: If the skater starts to spin with arms out-stretched, and then slowly pulls her arms in, the velocity of the spin increases dramatically. This is because the volume occupied by rotation is markedly diminished so to conserve the angular momentum, the spin must increase. In a Hydrogen atom, a negatively charged electron spins around the nucleus, a positively charged proton, in a hollow spherical path capable of containing two electrons, trying to neutralize the positive charge of the

proton and reach equilibrium. If a Hydrogen atom loses its electron in a process of ionization, a positively charged proton, or Hydrogen ion, is left behind. The electron can be separated from the hydrogen atom by an external force equal to or greater than the strength of its electrical attraction to the nucleus. When that happens, the volume it occupies suddenly becomes much smaller, and the electron mass, stripped from the atom, is pulled to its center, occupying less and less volume, and, just as with the skater, conservation of angular momentum causes its spin velocity to increase dramatically.

The angular momentum associated with the electron in orbit around the hydrogen atom is:

$\mathbf{L_o = I_o\omega_o}$

Where $\mathbf{I_o}$ is the moment of inertia in kg·m^2, and $\boldsymbol{\omega_o}$ is angular velocity in radians per second.

In accordance with Newton's second law, the mass of an object rotating about a center is pushed outward toward a maximum circumference in the plane of rotation by centrifugal force, until the centrifugal force is equaled by the centripetal forces acting to pull the mass of the electron back toward the center. Application of Newton's integral calculus to this process yields $\mathbf{I_o = m_e r_o^2}$, where $\mathbf{m_e}$ is the rest mass of the electron and $\mathbf{r_o}$ is the radius of the orbit. In orbit around the Hydrogen atom, the tangential velocity of the electron at any point is $\mathbf{v_o = r_o\omega_o \rightarrow \omega_o = v_o/r_o}$, and the momentum of the electron is $\mathbf{L_o = I_o\omega_o = m_e r_o^2(v_o/r_o) = m_e r_o v_o}$.

Conservation of momentum requires that when the electron is freed from the hydrogen atom, all the momentum of its orbital motion is transferred to angular momentum of spin as the volume it occupies contracts from the geometry of the outer shell of the atom toward the minimum localized quantum volume of the free electron, and the resulting angular momentum is $\mathbf{L_e = I_e\omega_e = m_e r_e^2(v_e/r_e) = m_e r_e v_e}$.

Since momentum is always conserved, when the electron is freed from the hydrogen atom's orbit, we can equate the angular momentum before ionization to the angular momentum after:

$\mathbf{L = m_e r_o v_o = r_e m_e v_e \rightarrow r_o v_o = r_e v_e}$ **(6.)**

Where $\mathbf{r_e}$ is the radius of the free electron and $\mathbf{v_e}$ is the spin velocity of the free electron. Solving equation **(6.)** for $\mathbf{v_e}$, we have:

$\mathbf{v_e = r_o v_o/r_e}$ **(7.)**

The radii of the hydrogen atom and the electron are well known from experimental data and classical calculations. The radius of the hydrogen atom is

$\mathbf{r_o} = 5.290\text{x}10^{-11}$m and the radius of a free electron is $\mathbf{r_e} = 2.8179\text{x}10^{-15}$m. We calculated the velocity of the electron in orbit as

$\mathbf{v_o} = 2.1874\text{x}10^{6}$m/s above. Substituting in the known values, we have:

$\mathbf{v_e} = 5.290\text{x}10^{-11}$ x $2.1874\text{x}10^{6}/2.8179\text{x}10^{-15} = 4.106\text{x}10^{10}$m/s

But, while the velocity of the electron in orbit was only a small fraction of the speed of light, this result is more than 100 times the speed of light! ($\mathbf{c} = 2.99792\text{x}10^{8}$m/s).[kk] This, however, is impossible. One of the two basic axioms of the theory of relativity is that nothing can be accelerated past the speed of light. [86; 216; 223] So this angular velocity will not be attained by the free spinning electron. When its angular velocity reaches the speed of light, the volume occupied by the electron is still finite, which is exactly what would be expected in a quantized reality. This finite volume, then, is the minimum possible volume of the free electron.

Just as it made sense to use the smallest mass, the mass of the electron as the quantum unit of mass, *it makes sense to take the minimum possible volume of the free electron as the quantum unit of space*. For a spinning object, that volume approximates $4/3\pi\mathbf{r_e^3} = 4/3\pi\mathbf{r_e} \simeq 4/3(3.1416)\text{x}\ (2.8179\text{x}10^{-15}\text{m})^3 = 2.6411\text{x}10^{-43}$ m^3. The mass of the electron reaches maximum density at the same time it reaches minimum volume. The smallest finite unit of space-time volume is the smallest possible distinction of extent that can be occupied by an *accelerated* spinning object. This ultimately smallest distinction of extent has a finite value because of the limit placed on the rotational velocity of any object possessing inertial mass by the light-speed limit of

relativity. [ll] We will make it our basic unit of space-time volume in the quantum math by assigning it the numerical value of 1. We have also defined the minimal quantal units of measurement for mass and energy by setting their values at the limiting volume equal to 1 (unity). Thus, we now have a rotational unit of mass-energy space-time equivalence as the basic unit of our quantum math. We call this quantum math, the Calculus of Dimensional Distinctions (CoDD).[mm] This means that the mass/energy content and space-time volume of elementary particles are multiples of the unitary quantum equivalence units of the smallest finite distinctions possible in quantized reality.

TABLE 11.1: Natural Quantum Equivalence Units and their Approximate Values in Conventional SI Units[nn]

Physical Phenomenon	**Conventional SI Numerical Value**	**Equivalence**	**Quantum Unit Equivalence**	**Naturalized Quantum Unit value**
Light As Wave	**2.99792x10^{8}** m/s	Space ↔ Duration	$\Delta S = \Delta T$	**c** = 1
Light As Photon	**2.99792x10^{8}** m/s	Extent ↔ Time	$\Delta x = \Delta t$	**c** = 1
Space	$4/3\pi r_e^3$ m^3= **2.6411x10^{-43}** m^3	Duration ↔ Volume	$\Delta T = \Delta S$	**Space** Quantum = 1
Distance	$2r_e$m = **8.4069x10^{-16}** m	Time ↔ Distance	$\Delta t = \Delta x$	**Distance** Quantum = 1
Time	**1.7526x10^{-23}** s	Volume ↔ Time	$\Delta S = \Delta t$	**Time** Quantum = 1
Energy	**0.511**MeV/c^2	Angular Momentum ↔ Energy	$\Delta L = \Delta E$	**Energy** Quantum = 1
Mass	**9.1094 x10^{-31}** kg	Energy ↔ Mass	$\Delta E = \Delta m$	**mass** Quantum = 1

Evaluating: $\Delta t = \Delta x/c = 2r_e/c = 2x(2.8179x10^{-15}m)/(2.99792x10^{8}m/s) = 1.7526x10^{-23}s$.

We have determined above that in quantized reality, the smallest possible quantum volume of space approximates $4/3\pi r_e^3$ where r_e is the radius of the free electron. This means that the smallest possible distance that can be traversed in a unit time is $2r_e$, the diameter of the free electron. In conventional units, we have $c = \Delta x/\Delta t$. Solving for Δt, we have $\Delta t = \Delta x/c = 1.7526x10^{-23}$ s. With **c** as a naturalized constant, $c = 1 = \Delta x/\Delta t$. Solving for Δt, we have $\Delta t = \Delta x$, and so in our system of quantum equivalence units, $\Delta t = \Delta x = 1 \rightarrow \Delta t = 1$. We now have quantum equivalence units for mass, energy, space and time consistent with Planck's discovery, $E = h\nu$, Einstein's $E = mc^2$, and De Broglie's $h = p\lambda$. Because Planck, Einstein and De Broglie's energy, mass and wave equations apply to all particles, these natural quantum units can be applied to all elementary particles as primary quantum equivalence distinctions for our Calculus of Dimensional Distinctions.

[ll] Extent implies 'measurable' distinctions. In this instance, these imply dimensional substrates, for example, Space and Time.
[mm] The Calculus of Distinctions refers to a calculus that deals with the conscious drawing of distinctions; a 'Dimensional Distinction' refers to distinctions whose boundaries can be defined in terms of functions of variables of extent. Therefore, a subgroup is the CoDD which implies detailed operations and an extended notation applicable to finite n-dimensional distinctions.
d[nn] SI unit is an International System of Units (SI) defines seven units of measure as a basic set from which all other SI units are derived.

Perspective
We have defined minimum quantum equivalence units for mass, energy, space and time, consistent with Planck's $\mathbf{E = }\boldsymbol{h}\mathbf{\nu}$, Einstein's $\mathbf{E = mc^2}$, and De Broglie's $\boldsymbol{h} \mathbf{= p\lambda}$, as the natural units of measurement for the ***Calculus of Dimensional Distinctions*** (CODD). We developed this quantum calculus after demonstrating that the calculus of Newton and Leibniz is inappropriate for application to quantum-scale phenomena because the variables of mass, energy, space, and time are integral in quantized reality and thus cannot approach zero infinitely closely. No quantized variable can have values between one and zero, and no quantum distinction can consist of less than one quantum equivalence unit. Real quantum distinctions can only consist of integer multiples of natural quantum equivalence units. It is important to note at this point that, as the basic units of measurement for the CoDD, defined as a quantum calculus, CEUs are *volumetric, i.e., three dimensional*, because 1-D or 2-D domains cannot contain volumetric mass or energy.

Because Planck, Einstein and De Broglie's equations describing energy, mass and wave phenomena apply to all real distinctions, whether observed and measured in particle or wave form, the calculus of dimensional distinctions, based on the natural quantum equivalence units defined in this paper, can be applied to all elementary and compound particles, including photons, electrons, quarks, protons neutrons and atoms.

The (CODD) provides a natural way to describe analyze the possible combinations and interactions of elementary particles, including the associated phenomena of symmetry, stability, angular momentum and spin.

The Origin Of Mass: Section 12

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There is no matter as such! **-**Max Planck [93]
So, what is mass?

Summary of this section. [122]
We hypothesize and then show that m*ass is the combined resistance to acceleration due to the angular momentum related moments of inertia of the rapidly spinning elementary particles that, in combination, make up an object. Quantum equivalence units(QEU) are not particles but measures of mass, and/or energy.* Separate from the CODD calculations, the half-life and masses of elementary and composite particles has been calculated by the Particle Physics Group.

INTRODUCTION
Hypothesis: *Mass is nothing more and nothing less than combined resistance to acceleration due to the angular momentum related moments of inertia of the rapidly spinning elementary particles that, in combination, make up an object. Quantum equivalence units(QEU) (as defined in the previous section) are not particles. They are measures of mass, and/or energy. The quantum equivalence unit is based on the* physical characteristics *of the electron.*

The Mass of the Electron, Up-Quarks and Down-Quarks
We have set the mass of the electron equal to unity and determined the masses of up- and down-quarks from collider data, and we can also determine their inertial masses by applying physical principles. For spinning objects, the Moment of Inertia is $\mathbf{I = kmr^2}$, where **m** is mass, **r** is the radius of rotation and the factor **k** depends on the axis of rotation and the physical shape of the spinning object. Lists of moments of inertia

have been compiled for a variety of shapes of physical objects, spinning in various ways.[27, 28 oo pp qq] Quantum equivalence units (QEUs) are defined by the rest mass and volume of the electron, and we saw in previous sections that the electron behaves more like a cloud or fluid rather than a particle, distributed around the $\mathbf{F_o = F_i}$ circumference of rotation (See equations (4) and (5) in Section 3), so that $\mathbf{k = 1,}$ and $\mathbf{I_e = m_e r_e^2} = 1x1x1^2 = 1$ quantum of mass, indicating that *the inertia of a free spinning electron is equal to its mass*. [239 23; 239] Therefore, we have verified the hypothesis that mass is equal to the inertia due to spin in the case of the electron.

In the quantum mathematics of the Calculus of Dimensional Distinctions (CoDD) [17; 19; 20; 215], the mass of any free spinning particle is a multiple of $\mathbf{m_e}$, so the next larger spinning particle with a radius, $\mathbf{r_u}$, of $2\mathbf{r_e}$ is equal to $\mathbf{I_u = m_e r_u^2} = 1x2^2 = \mathbf{4}$ QEU of mass, which confirms the mass value of the up-quark. For the next larger particle, with a radius of 3 electron radii, $\mathbf{I_d = m_e r_d^2} = 1x3^2 = \mathbf{9}$ QEU of mass. These mass values for the electron, up-quark and down-quark agree exactly with the naturalized experimental data [23; 231; 232; 239; 247; 248] including in the Large Hadron Collider [209] Therefore, we have shown that for the electron, the up-quark and the down-quark, mass = inertia, proving the hypothesis that, at least for these fermions, ***mass is equal to the inertia created by spin***. For objects composed of QEU vortices, like protons, neutrons and atoms, their mass should also be due to the angular momentum created by spin. Determining their mass however, is a-more complicated than for the elementary QEU vortices, the quarks.

Separate from the CoDD calculations, the half-life and masses of elementary and composite particles has been calculated by the Particle Physics Group. [249]

The Proton: Section 13.

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Summary of this section. [250]

If mass is the sum of moments of inertia of spinning particles, the inertial mass contributed by a quark in a compound structure should be greater than its mass as a free particle because the quark's radius of rotation will be greater. In the 3S-1t domain revealed by our physical senses, while we may conceptualize space, time, matter, and energy as separate aspects of reality, we never find one of them existing alone without the others. The usefulness of any observation or measurement is maximized and will be most meaningful if it includes all of the known parameters of reality related to the combination or system being observed. The minimal quantized distinction described [17], from which we define new quantum units of observation and measurement, should therefore include not just space and mass, but space, time, mass, and energy. We apply the dimensionometric logic of the Calculus of Dimensional Distinctions (CoDD) to establish how stable protons (now, and later), neutrons and atoms are formed. We apply vortices composed of integer multiples of unitary space-time mass-time equivalence distinctions *to explain how quarks* combine to form stable physical structures. Each of these vortices are symmetrical round their axes and these are three-dimensional volumes that are integers. We apply Close's Conveyance Equation and show that integer multiples of quantum equivalence units cannot form a symmetrically stable object (such as a proton) without making

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oo The moment of inertia, or the angular rotational inertia, of a rigid body determines the torque needed for a desired angular acceleration about a rotational axis. It depends on the body's mass distribution and the axis chosen, with larger moments requiring more torque to change the body's rotation. Moment of inertia is defined as in classical mechanics and relativity

pp Acceleration is any change in motion.

qq Angular momentum is defined as in classical mechanics and relativity. Angular momentum (also called moment of momentum or rotational momentum) is the rotational analog of linear momentum. It is a conserved quantity and remains constant unless acted on by an external torque. It is a pseudovector that represents the product of a body's rotational inertia and rotational velocity about a particular axis.

modifications such as adding an extra component. Note that the Conveyance Equation relates to real life—and can be applied integrally and quantized, and a Partial Differential Equation, and physicists can recognize it, just as they do the Schrödinger equation. The units of mass and energy in the quarks alone cannot form a symmetrical spinning object and the elementary vortices will have to have additional quantum equivalence units to form a stable proton. This is a radical but necessary hypothesis. Because the contents consist of quantum equivalence units of mass, energy and/or the third form of the substance of reality (gimmel), and they are spinning, we've called the quantum equivalence units, Triadic Rotational Units of Equivalence (TRUE). *Three mutually perpendicular planes of spin will develop,* and the total TRUE as mass rotating around the center of the proton will be the sum of the units of mass in the constituent particles. Based on this symmetry and the formulae for rotating vortices, the mass of the proton is 1836 quantum equivalence units.[rr] *This agrees precisely with particle physics experimental data.*
This means that, if the data holds for the neutron (and therefore for the associated quarks) and knowing that the electron calculations already exist as 0.511 normalized to1, we have empirically demonstrated that these TRUE units are not just theoretical operators but real empirical data in our physical reality. We have effectively, proven gimmel (e.g., through the Conveyance Equation) and TRUE as Quantum Equivalence Units are real. A wise colleague wrote: "Gimmel is like the king in the chess game."

The most distinctive property of quarks is their electric charge and the quark particle has a charge one-third and two-thirds that of the proton [251; 252] We have proposed that these quarks, like electrons, are rapidly spinning energy vortices. The proton is a compound entity containing two up-quarks and one down-quark. If in combination, the masses of quarks were additive, [253] like adding the weight of apples in a basket, the expected mass of a compound particle like the proton would simply be the masses of the up-quarks and down-quark added together, and the proton should have a mass of 2x4 + 9, or 17 quantum equivalence units. But, if mass is the sum of moments of inertia of spinning particles as we have proposed, this will not be the case.
We propose then that the inertial mass contributed by a quark in a compound structure *should* be greater than its mass as a free particle because the quark's radius of rotation will be greater: The quarks will be spinning around the center of the compound particle with a larger radius of rotation, and thus the inertial mass added by a quark in combination in a proton will be greater than the mass of the quark alone. To evaluate how much greater, we must consider the proton as a spinning vortex created by the combination of three elementary QEU vortices, two up quarks with a rest mass of 8 (4 each) and one down-quark with a mass of 9, for as total rest mass of 17. (See Table 13.1).

In the 3S-1t domain revealed by our physical senses, while we may conceptualize space, time, matter, and energy as separate aspects of reality, we never find one of them existing alone without the others. [202] As Einstein stated, space has no meaning [87; 223; 237; 254] without mass [223; 237]. Mass and energy are just two forms of the same thing, and time is meaningful only in relation to the dynamic interaction of spatially extended mass and energy fields. If the goal is to gain an understanding of the true nature of reality, then the usefulness of any observation or measurement is maximized and will be most meaningful if it includes all of the known parameters of reality related to the combination or system being observed. The minimal quantized distinction as calculated [17], from which we define new quantum units of observation and measurement, should therefore include not just space and mass, but space, time, mass, and energy. [2; 22; 23; 101; 103; 110; 155; 255; 256] To see how stable protons, neutrons and atoms are formed, we will apply the dimensionometric logic of the Calculus of Dimensional Distinctions (CoDD) and take a close look at what happens when vortices composed of integer multiples of unitary space-time mass-time equivalence distinctions combine to form stable physical structures. Before we can fully apply the quantum calculus of CoDD to all aspects of

[rr] The kp is 3 as there are three orthogonal ('parangular') rotations. the masses are the up and down quark values, the 6 is the radius which we know from half the cube root of the total TRUE volume.

quantum reality, the fundamental mathematical operations will have to be re-defined in the CoDD system of mathematical logic; but for now, we will only apply the CoDD fundamental operation of the merging of dimensional distinctions. This CoDD operation is analogous to the fundamental operation of addition in conventional mathematics. But elementary quantum distinctions like quarks, cannot be particles.

TABLE 13-1: The Spinning Proton Vortex

Particle Vortex (Quarks)	QEU Mass
$\mathbf{u_1}$*	4
$\mathbf{u_2}$	4
$\mathbf{d_1}$	9
Total	17

They must combine like fluid vortices, spinning with inertia formula constant **k = 1**, to be form stable new quantized distinctions. For the new object (e.g. a proton) to be stable, the combined integral number of QEUs must be able to form a symmetric shape in three dimensions. The CoDD representation of combinations of integral numbers of basic quantum equivalence units is represented by the conventional generator of Diophantine equations: $\mathbf{\Sigma^n_{i=1}\,(X_n)^m = Z^m}$. Some simple numerical examples will help clarify this point, and provide an explanation for why quarks combine in triads: When **n = 2 and m = 3**, $\mathbf{\Sigma^n_{i=1}\,(X_n)^m = Z^m}$ yields $\mathbf{(X_1)^3 + (X_2)^3 = Z^3}$, and since all variables must be integers in our quantized reality, we see that Fermat's Last Theorem tells us that there can be no integer solutions for $\mathbf{X_1}$, $\mathbf{X_2}$, and **Z** in this equation. But when **n = m = 3**, $\mathbf{\Sigma^n_{i=1}\,(X_n)^m = Z^m}$ yields $\mathbf{(X_1)^3 + (X_2)^3 + (X_3)^3 = Z^3}$, and there are, for example, $\mathbf{(3)^3 + (4)^3 + (5)^3 = 6^3}$. (More about this later.) Substituting the normalized masses for up- and down-quarks (as in the proton) from Table 13.1 into the Conveyance Equation $\mathbf{(X_1)^3 + (X_2)^3 + (X_3)^3 = Z^3}$, we have:
$\mathbf{(4)^3 + (4)^3 + (9)^3 = Z^3}$, $\rightarrow \mathbf{Z^3} = 64 + 64 + 729 = 857$.
But this is not an integer solution of the conveyance equation $\mathbf{(X_1)^3 + (X_2)^3 + (X_3)^3 = Z^3}$, because, with $\mathbf{X_1}$, $\mathbf{X_2}$, and $\mathbf{X_3}$ equal to integers, $\mathbf{Z^3}$ = 857, and 857 is not an integer cubed, and thus **Z** is not an integer. The cube root of 857 is ~ 9.4986[3].
This means that *these integer multiples of quantum equivalence units cannot form a symmetrically stable object without making modifications such as adding an extra component.* Yet the proton is very stable and must exist integrally. The **half**-life of a particle is the time it takes for half of the **particles** in a sample to decay. Yet, we know that protons are exceedingly stable, into the billions of years. (e.g. some calculations show it is 10^{21} years or even 10^{30} years.) [251; 257] Therefore, if our hypothesis is correct, then the units of mass and energy in the quarks alone cannot form a symmetrical spinning object and *the elementary vortices will have to have additional quantum equivalence units to form a stable proton. This is a radical but necessary hypothesis and a solution is indicated below.*
To determine what the minimum necessary additional quantum equivalence units may be, we must find a conveyance equation solution reflected in Table 13.2 with a combination of units that will include the masses of two up-quarks and one down-quark and using as *few additional quantum units as possible*. This is because nature should obey the 'law of parsimony'. [258; 259; 260]
One of the things that makes science interesting and challenging is that much of reality is hidden from us because of the limitations of our physical senses. But, as Albert Einstein in 1953 said: *Rafinert ist der Herr Gott, aber Bohaft ist er nicht!* This translates to *"The Lord God is very clever, but he is not malicious!"* [202]
As Einstein suggested, there is no reason to believe that reality, whatever its ultimate nature, is maliciously hiding things from us, or will be more complex than necessary. In cases where the answer to a problem is not immediately obvious, scientists and mathematicians are guided by the principle of *Occam's razor* which says: *"Among competing hypotheses, the one with the fewest assumptions should be selected."* [258; 259; 260] This is the law of parsimony. [259] With this in mind, let's look at the solutions in Table 13.2.

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There are a limited number of Diophantine solutions for this triadic combination equation [79,80]. The first (parsimonious) solution that will work for the proton, is: $\mathbf{6^3 + 8^3 + 10^3 = 12^3}$. This means that the Total QEU figures in Table 13.2 should be 6, 8, and 10 and we will have to add in more Quantum Equivalence Units to obtain a symmetrically stable integer solution. Using this solution to calculate the additional quantum equivalence units required for a spinning proton to be symmetrically stable, we have 12^3 (Table 13.2).

u1, u2, d1, d2 reflect the first and second up quarks and the down quarks in the protons and neutrons. There are two up-quarks and one down-quark in the proton. There are two down-quarks and one up-quark in the neutron. [234; 261; 262; 263; 264; 265]

TABLE 13-2: The Symmetrically Stable Proton

Particles vortices (Quarks)	QEU Mass	Additional Required QEUs	Total Quantum Equivalence Units	TRUE Volume
$\mathbf{u_1}$	4	2	**6**	216
$\mathbf{u_2}$	4	4	**8**	512
$\mathbf{d_1}$	9	1	**10**	1,000

We have already empirically demonstrated mathematically that the quarks of the proton, namely u_1 and u_2 have 4 quantum equivalence units of mass, and d_1 has 9 quantum equivalence units of mass. These they register as up-quarks and down-quarks [262] in collider data [209]. Nonetheless, these extra units *cannot be units of mass or energy,* because, if they were, the resulting vortex would not be identifiable as the same particle, in this instance, the proton. It would be fundamentally different in properties as mass-energy would change. The quarks must therefore have additional units to produce an axially rotating symmetric, and therefore stable proton. These additional units, we will show, vary for each quark type (u1, u2, d1, d2) and even within each quark type (in Table 13.2 the additional QEUs are different, for example, for u1 and u2 and we will see in the neutron (e.g. in Sections 14 through 19 ultimately there are three other different figures making 6 different QEUs (ironically 1 through 6) for the extra. QEUs in the protons and neutrons. [2; 4; 101]

But there is a big *but*! If the additional units required for stability are neither mass nor energy, what are they? *They are quantum equivalence units of a third form of the stuff of reality, occupying space-time, but not registering as mass or energy*. Since they have not been identified before, we have chosen ***gimmel***, the third letter of the Hebrew alphabet. This represents this new, third form of the stuff of reality.[4] We have proposed that it conveys the logic of ‘Primary Consciousness’, the intelligence behind the physical universe. [4] At this point, what else could this third substance be besides some kind of consciousness? This also fits the proposals in our book, At this point, what else could this third substance be besides some kind of consciousness? This also fits our book. [54]. We will show later that this is a real empirical calculation corresponding with the mass-energy volumetric data in the Large Hadron Collider. [209]

Triadic Rotational Units of Equivalence (TRUE)

At this point in this discussion, because we have re-defined elementary particles *as rotating energy vortices* and discovered the necessary existence of additional quantum units that are neither mass, nor energy, but that are required for the proton to be symmetrically stable, we have added something important to the concept of *quantum equivalence units* (QEU).

Recall that space and time, i.e., space-time or extent, has no existence of its own [223; 237], and a volumetric distinction consisting of quantum equivalence units is defined by its contents [17; 19; 20]. Those contents consist of quantum equivalence units of mass, energy and/or the third form of the substance of reality (gimmel), and they are spinning. Thus, it is appropriate to call them *Triadic Rotational Units of Equivalence (TRUE),* [2; 4; 22;

[23; 25; 101; 103; 110; 155; 255] the term we will use henceforth.

The Stable Combination of Quarks Known as the Proton

Assuming similarity of shape for all TRUE, i.e., symmetrically spinning vortices, as enumerated in the sections above, and in conformance with application of the Pythagorean Theorem in Dimensional Extrapolation,[ss] *three mutually perpendicular planes of spin will develop,* and the total TRUE as mass rotating around the center of the proton will be the sum of the units of mass in the constituent particles. So, for the compound vortex —combination of several component vortices— we call the proton, the total mass of the constituents, two up-quarks and one down-quark, is only **2x4 + 9 = 17**, but the *inertial mass of the proton* will be determined by those 17 TRUE rotating around the proton total TRUE volume of **1728**, with a cross-section of **12** TRUE. (as the volume is 12^3). See Table 13.2, above.

We have shown that when the volumes of energy vortices are expressed in TRUE, their mass is equal to their moment of inertia: $\mathbf{I = kmr^2}$, where **m** is mass, **r** is the radius of rotation and the factor **k** depends on the axis of rotation and the physical shape of the spinning object.

We have also shown that in combinations of elementary vortices, the shape factor cancels out and does not affect the solution of the conveyance equation because they must remain symmetric round the rotating axis otherwise they would become unstable. This means that in the combination of three quark energy vortices, **k** depends solely on the axis of rotation. But, in the combination of three quarks, there are three axes of rotation, and equilibrium in the spinning compound vortex occurs by the natural redistribution of the angular momentum of the three combining vortices into three mutually orthogonal planes of rotation, so in this case, each plane of rotation contributes equally, and therefore, $\mathbf{k_p = 3}$.

Referring to Table 13.2, above, we see that the total TRUE volume of the symmetrically stable proton is $1728 = 12^3$. Here, we must remind ourselves that the TRUE is not a separate object, like a particle or vortex: *TRUE calculations reflect units of volumetric measurement.* [4] Its value is always unitary and the number of TRUE units in any vortex is always integral. In CoDD operations, the volume of the spinning vortex called the proton is perfectly symmetrical and the cube root of the volume is the CoDD diameter of the volume, and, as shown above, Fermat's last theorem [266; 267; 268; 269; 270] proves the lack of perfect symmetry of two items. There is not continuum in a quantized world.

Table 13.3: Key features of the proton mass derivation applying TRUE

Particles vortices (Quarks)	QEU (Mass energy volume equivalents)	TRUE Volume	Radius (half the diameter)
$\mathbf{u_1}$	4	216	
$\mathbf{u_2}$	4	512	
$\mathbf{d_1}$	9	1,000	
Total	17	**$1728 = 12^3$**	**12/2 =6**

In the macro-universe, this may not appear to be so empirically, but we know that a rotating object is symmetrical about their axes of rotation and would occupy a perfectly symmetrical sphere as space is continuous. If not, the rotating object would fall off its axis, and that cannot happen. Based on this symmetry, we can see that the mass of the proton is $\mathbf{m_p = I_p = k_p(2m_u + m_d)xr_p^2 = 3(2x4 + 9)(6)^2 = 3x17x36 = 1836}$ **quantum equivalence units**.[tt] *This agrees precisely with particle physics experimental data that puts the*

[ss] Dimensional Extrapolation involves the conceptual projection from an n-dimensional domain to an (n + 1)-dimensional domain. It is a mathematical dimensionometric process for defining the dynamic relationship of dimensional domains and number theory through rotation and projection.

[tt] The kp is 3 as there are three orthogonal ('parangular') rotations. the masses are the up and down quark values, the 6 is the radius which we know from half the cube root of the total TRUE volume.

mass of the proton at 938.27 MEv/c^2 which converted to quantum equivalence units is 938.27 divided by 0.511 = 1836 quantum equivalence units or to use the name for these QEUs, TRUE units![uuu] (Table 13.3) [23]

This means that, if the data holds for the neutron (and therefore for the associated quarks) and knowing that the electron calculations already exist as 0.511 normalized to1, we have empirically demonstrated that these TRUE units are not just theoretical operators but real empirical data in our physical reality. [2; 101; 232; 251; 271 232] *We have effectively, proven gimmel and TRUE as Quantum Equivalence Units are real. We have also justified the hypotheses of vortical objects rotating through 3 parangular* [vv] *axes.* [54]

The Problem Of Determining The Mass Of The Neutron: Section 14.

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Summary of this section. [35]
The mass of the neutron cannot be determined directly from the LHC data for several reasons, including its instability as a stand-alone particle. But it has been determined indirectly by subtracting the mass of the protons from the mass of nucleons like the nucleus of the deuterium atom leaving the mass of the neutron plus the binding energy, as 939.5656 MeV, converting to ≈ 1839 TRUE, just 3 TRUE larger than 1836, the TRUE proton mass.
The CoDD inertial mass method we used to calculate the mass of the proton, will not work to determine the effective mass of the neutron because the neutron appears to be formed in a completely different way involving Hydrogen atoms and entropy.
TRUE analysis of hydrogen and deuterium nucleons [ww] sheds some much needed light on the problem of why neutrons and deuterium atoms exist and how they are formed.
The mass of the neutron cannot be determined directly from the LHC data for several reasons, including its instability as a stand-alone particle. But it has been determined indirectly by subtracting the mass of the protons from the mass of nucleons like the nucleus of the deuterium atom leaving the mass of the neutron plus the binding energy, which can be directly determined. In this way, physicists have determined the mass of the neutron to be 939.5656 MeV [199; 272], which is equivalent to 939.5656/0.511 ≈ **1839** TRUE, just **3** TRUE larger than 1836, the TRUE proton mass, even though the quark components of the neutron, one up-quark and two down quarks: **4 + 2x9 = 22**, which is **5** TRUE more than the components of the proton (two up-quarks and one down-quark: **2x4 +9 = 17** TRUE). This may at first seem puzzling, but it is actually a clue in the CoDD analysis that leads to understanding how neutrons are formed.

Table 14.1 Important derivations of the masses of the proton and the neutron applying LHC and TRUE (/0.511 is H)

	MeV	TRUE	Quark components	
Proton	938.27 MeV/c^2	**1836**	**2x4 +9 = 17**	
Neutron	939.5656 MeV	**1839**	**4 + 2x9 = 22**	

[uu] 0.511 is the mass of the electron in the LHC. Hence the division is by 0.511 to obtain normalized data where electrons srt scored as 1.
[vv] Parangular; As one increases the number of dimensions, dimensionometry reflects an orthogonality that is relative to the framework of observation. "Parangular" reflects relative (dynamic across dimensions) orthogonality and is particularly important in analyses across higher dimensions. Orthogonal is the relation of two lines at right angles to one another (perpendicularity), and the generalization of this relation into n dimensions.
[ww] Nucleon: Proton or neutron

Adding to the puzzle, we know that the hydrogen atom, composed of one electron and the proton it is orbiting, is very stable, because free hydrogen makes up about 75.6% of the mass of the universe today [28; 105], not much different from the estimated percentage shortly after the big bang [40] This is puzzling because hydrogen is very reactive, bonding easily with many other elements to form complex compounds. So, why has the amount of free hydrogen atoms in the universe remained virtually constant for billions of years?

We propose that the answer might be relatively simple. The universe has no absolute beginning or end; it is dynamically cyclic. Not in terms of a big-bang followed by a big crunch, followed by another big-bang [271; 273]: that would be the case if the universe were only three dimensional. To get there, we must start by applying TRUE analysis to things that we know do exist: the protium atom (hydrogen) the neutron and the deuterium atom. We know they exist based on large quantities, e.g. terra-bytes of experimental data [209], but the current paradigm, the Standard Model of Particles Physics [45; 46], doesn't satisfactorily explain why the hydrogen atom is so stable or why the neutron and the deuterium atom exist.

Treating the proton as a compound energy vortex formed from the volumetric combination of three quark (two up-quarks and one down-quark), we have calculated its mass as **1836** TRUE, which is equivalent to 938.27 MeV/c^2 the proton mass determined from LHC data [2; 101; 232; 251; 271 232]. This is an important verification that the CoDD TRUE analysis approach is correct.

The CoDD inertial mass method we used to calculate the mass of the proton, will not work to determine the effective mass of the neutron because the neutron appears to be formed in a completely different way involving Hydrogen atoms and entropy.

But the mass of the neutron *can* be determined using the CoDD and TRUE analysis. The hydrogen atom is formed by the volumetric combination of TRUE volumes of mass, energy and gimmel in accordance with the Diophantine combination equations derived from the conveyance expression, and the neutron is formed in an entirely different way, in the entropic process of two hydrogen atoms forming the deuterium atom, one of the most stable compound structures in the universe. In this way, the neutron, which if separated from the deuterium atom would decay relatively quickly, becomes an integral part of the many different stable life-supporting atoms of the universe.

So far, describing reality as consisting of integer combinations of elementary distinctions may seem no less reductionist than the Standard Model Particle Physics [45; 46]. It may even appear that TRUE analysis presupposes that reality is simply built up from electrons as the basic unit of mass, with the basic unit equal to 1 TRUE of mass, to produce more and more complex structures: from elementary particles, to the compound particles, protons and neutrons, to atoms, etc.
However, that is not the case. Physicists hypothesize that hydrogen atoms, neutrons and helium atoms are formed in the intense heat of stars like our sun, [271] but no one has yet explained exactly how this happens. TRUE analysis of hydrogen and deuterium nucleons [xx] sheds some much needed light on the problem of why neutrons and deuterium atoms exist and how they are formed.

[xx] Nucleon: Proton or neutron

Applying Hydrogen-1 And Deuterium: The Origin Of Mass: Section 15.

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Summary of this section. [274]
Hydrogen is the most abundant element in the universe today, and apparently has been very abundant for billions of years. It is the only atom that contains no neutrons. Far the most common Hydrogen atom (^{1}H Protium) consists simply of one electron and one proton, and hydrogen molecules consist of two hydrogen atoms (H_2) sharing their electrons. This is possible because the first electron shell of each atom can contain exactly two electrons.
All other atoms of the natural elements of the Periodic Table contain protons and electrons in exact numbers that balance their electrostatic charges, but they also contain neutrons, which have no charge. Physicists can explain how neutrons are formed in the beta plus decay of two protons. The proton is a very stable combination of three quarks, with a half-life longer than the big-bang age of the universe. A free neutron decays in 10-15 minutes.
We ask difficult questions and over the next sections provide answers:
"Surely, hydrogen should be unstable?"
"*Why is there more hydrogen?*" to begin with.
And "*Why does it not have a neutron in it?"* And
"Where did the neutron come from, how did it arise?"
"What is purpose of radioactive decay?"

We apply Diophantine triplets and the CoDD, and the smallest solution that works for the neutron, with one up-quark and two down-quarks, is the fourth primitive solution: $7^3 + 14^3 + 17^3 = 20^3$. Hydrogen-2, requires an electron requires a total of 106 additional units and double $12^3 + 19^3 + 53^3 = 54^3$ produces $(108)^3$.
If the additional units could be detected as mass and/or energy, the resulting particles would not be identifiable as the same quarks, protons, or neutrons but a different almost certainly unusable chemical. Hydrogen without Gimmel is asymmetric and unstable because the total volume is not a cube. Additional units must increase the total angular momentum, making the atom symmetrically stable. The only way the hydrogen atom can be as stable as the proton is for the atom to have a third component consisting of 38 TRUE, not measurable as mass or energy: The calculations require equivalent gimmel to the neutron TRUE score in Deuterium. This satisfies the Conveyance Equation and produces a stable hydrogen atom with a total TRUE unit volume of 108^3. *This suggests that, if gimmel represents consciousness, then the Hydrogen atom contains more consciousness than Deuterium and consequently, any other more complex atom containing neutrons.*
We can prove this empirically. The mass of the hydrogen atom is well known as 1.0078 atomic mass units (amu). The amount of energy equivalent of an atomic mass unit has been demonstrated to be 931.49 MeV. Applying these conversion factors, we have: 1 hydrogen atom in TRUE = (1.0078 x 931.49)/0.511= 1837 TRUE.
The conversion from amu to TRUE for neutrons is also the same. These exactly verify the TRUE result based on CoDD triplets .
Spinning vortices arrive at a more symmetric configuration by ejecting some mass/energy. The conversion of Hydrogen 1 to Hydrogen 2 requires a natural 'decay' process involving neutrinos and positrons which come out unchanged and are linked not only with the mass particles but with the gimmel. This may be because of the conservation of mass-energy-gimmel must occur. The process of conversion from two hydrogen atoms to

a deuterium atom, involves beta-decay and neutrinos, and a release of energy and in this case a positron. If it's minus decay, it's an electron. The total number of TRUE and total volume in the Deuterium atom plus emissions still remain unchanged from the totals before the combination demonstrating conservation of mass, energy and gimmel. *We call this the law of conservation of TRUE units. Because it's conserved it reflects ordropy. Decay in this context may be a misnomer.*

Hydrogen, the most Abundant Element

Hydrogen is the most abundant element in the universe today, and apparently has been very abundant for billions of years. It is the only atom that contains no neutrons. Far the most common Hydrogen atom (^{1}H Protium) consists simply of one electron and one proton, and hydrogen molecules (H_2) consist of two hydrogen atoms sharing their electrons. All other atoms of the natural elements of the Periodic Table [40; 256; 275] contain protons and electrons in exact numbers that balance their electrostatic charges, but they also contain neutrons, which have no charge. So, why are they there, and where do they come from? While physicists can explain how neutrons are formed in the beta plus decay of two protons [196; 197; 198; 199; 261; 272], when asked exactly why they are there and what purpose they serve, their answers are far from convincing. TRUE analysis, on the other hand, with gimmel, offers a much more satisfactory explanation.

The proton is a very stable combination of three quarks, and even without an electron to balance its electrostatic charge, it is perhaps the most stable sub-atomic vortex, with a half-life longer than the big-bang age of the universe, while a free neutron decays in about 15 minutes: exact figures vary e.g. 878-879 seconds (using the magnetic bottle technique) or 886-890 seconds (using the 'magnetic proton trap') [196] or a more rapid figure of 10.3 minutes [271]. Importantly, calculations of beta-decay can be made for subatomic particles. [197; 198; 199; 272; 276; 277; 278; 279; 280]

TABLE 15.1 Diophantine triplet solutions (the first three dozen)

$\mathbf{3^3 + 4^3 + 5^3 = 6^3}$	$\mathbf{1^3 + 6^3 + 8^3 = 9^3}$	$6^3 + 8^3 + 10^3 = 12^3$ *(proton solution)*
$2^3 + 12^3 + 16^3 = 18^3$	$\mathbf{3^3 + 10^3 + 18^3 = 19^3}$	$\mathbf{7^3 + 14^3 + 17^3 = 20^3}$ *(neutron solution)*
$12^3 + 16^3 + 20^3 = 24^3$	$\mathbf{4^3 + 17^3 + 22^3 = 25^3}$	$3^3 + 18^3 + 24^3 = 27^3$
$\mathbf{18^3 + 19^3 + 21^3 = 28^3}$	$\mathbf{11^3 + 15^3 + 27^3 = 29^3}$	$15^3 + 20^3 + 25^3 = 30^3$
$4^3 + 24^3 + 32^3 = 36^3$	$18^3 + 24^3 + 30^3 = 36^3$	$\mathbf{2^3 + 17^3 + 40^3 = 41^3}$
$\mathbf{6^3 + 32^3 + 33^3 = 41^3}$	$\mathbf{16^3 + 23^3 + 41^3 = 44^3}$	$5^3 + 30^3 + 40^3 = 45^3$
$3^3 + 36^3 + 37^3 = 46^3$	$27^3 + 30^3 + 37^3 = 46^3$	$24^3 + 32^3 + 40^3 = 48^3$
$8^3 + 34^3 + 44^3 = 50^3$	$\mathbf{29^3 + 34^3 + 44^3 = 53^3}$	$\mathbf{12^3 + 19^3 + 53^3 = 54^3}$ *(double is ^2H solution)*
$\mathbf{36^3 + 38^3 + 42^3 = 56^3}$	$15^3 + 42^3 + 49^3 = 58^3$	$21^3 + 42^3 + 51^3 = 60^3$
$30^3 + 40^3 + 50^3 = 60^3$	$7^3 + 42^3 + 56^3 = 63^3$	$\mathbf{22^3 + 51^3 + 54^3 = 67^3}$
$\mathbf{36^3 + 38^3 + 61^3 = 69^3}$	$\mathbf{7^3 + 54^3 + 57^3 = 70^3}$	$\mathbf{14^3 + 23^3 + 70^3 = 71^3}$
$34^3 + 39^3 + 65^3 = 72^3$	$38^3 + 43^3 + 66^3 = 75^3$	$31^3 + 33^3 + 72^3 = 76^3$

According to the Standard Model of Particle Physics [46; 47; 48; 281; 282], quarks, electrons and neutrinos were the first particles out of the big bang, and within a 100th of a second, quarks began to combine, and about a million years later, atoms began to form [271 29 273], but TRUE analysis as applied so far, suggests that simple natural processes going on right now explain the formation of all the elements of the Periodic Table and their isotopes. They depend on the existence of electrons, gimmel, protons, hydrogen, neutrons, and deuterium, as

well as quarks, plus neutrinos and positrons. [2; 101] *"Surely, hydrogen should be unstable?"*
"*Why is there more hydrogen?*" to begin with.
And "*Why does it not have a neutron in it?"* And
"Where did the neutron come from, how did it arise?"
"What is purpose of radioactive decay?"

Let's start by looking at the TRUE analysis of the neutron:
The neutron has within it, one up-quark and two down-quarks. [235; 261; 265]. So what does the neutron look like in TRUE? From the list of integer solutions of the Diophantine conveyance equations (Table 15.1), applying Occam's razor [259; 260], we find that the smallest solution that works for the neutron, with one up-quark and two down-quarks, is the fourth primitive solution: $\mathbf{7^3 + 14^3 + 17^3 = 20^3}$.

Using this solution, we can determine the additional required quantum equivalence units needed to produce a stable neutron (Table 15.2).
The simplest stable compound structure containing all three elementary particles: electrons, protons and neutrons, is Deuterium.

TABLE 15.2 THE NEUTRON

Particle	TRUE Mass	Additional TRUE (Gimmel)	Total TRUE	TRUE Volume
$\mathbf{u_3}$	4	3	7	343
$\mathbf{d_2}$	9	5	14	2,744
$\mathbf{d_3}$	9	8	17	4,913
Totals	**22**	**16**	**38**	**8,000=20^3**

Table 15.3: The Deuterium Atom (H2)

Particle	Mass	Additional TRUE (Gimmel)	Total TRUE	TRUE Volume
$\mathbf{e^-}$	1	105	106	1,191,016
$\mathbf{P^+}$	17	7	24	13,824
$\mathbf{N^0}$	22	16	38	54,872
Totals	**40**	**128**	**168**	**(108)3**

Applying the TRUE totals for the proton and neutron, i.e., **24** and **38**, the smallest integer solution in Table 15.3 containing the values $\mathbf{X_1 = 24}$ and $\mathbf{X_2 = 38}$ is obtained by multiplying the solution $\mathbf{12^3 + 19^3 + 53^3 = 54^3}$ by **2**, yielding the integer solution $\mathbf{24^3 + 38^3 + 106^3 = 108^3}$. [yy] One electron combined with one proton and one neutron is the stable combination known as Hydrogen-2, or Deuterium. For this combination to be symmetrically stable, the electron requires a total of 106 additional units.[zz]By inspecting Table 15.3 we see that the stability of these spinning objects, and therefore, the stability of the universe as we know it, depends on the existence of the additional units (TRUE) of gimmel that are not detectable as mass or energy.
Mass and energy are the only measurable parameters by which we can identify elementary particles. If the additional units could be detected as mass and/or energy, the resulting particles would not be identifiable as the same quarks, protons, or neutrons but a different almost certainly unusable chemical.

[yy] *The reason this triplet* is $\mathbf{12^3 + 19^3 + 53^3 = 54^3}$ *is doubled is it had to be ≥24 for proton, and ≥38 for neutron.*
[zz] This large number may not be surprising as the electron is rotating vortically around a far greater axis.

The Hydrogen Atom

Hydrogen makes up about 75% of the baryonic mass of the universe. (*Baryonic mass* refers to atoms and combinations of atoms of the elements in the Periodic Table.) [28; 40; 46; 105; 142; 283; 284]Even though Hydrogen readily combines with other elements to form water (with oxygen as hydrogen-hydroxide), organic compounds (including also carbon and others) and millions of other compounds, it is still the most common free gas and ionized gas in the universe. Given the current estimated age of the universe, the abundance of Hydrogen as free atoms and ions across the universe is surprising. Table 15.4 shows the TRUE analysis of the Hydrogen atom as it would exist without gimmel.

This combination is asymmetric and unstable because the total volume is not a cube. It should be easily ionized and combined with other elements. So why are there so many free hydrogen atoms in the universe?

The answer is that, as with quarks, there are additional units increasing the total angular momentum, making the atom symmetrically stable.
Looking back at the deuterium atom (Table 15.3), we see that symmetry is achieved if the Total TRUE column has an additional 38 units. The TRUE stable Hydrogen atom with the appropriate number of TRUE of gimmel is shown in Table 15.5.

Table 15-4: Hydrogen without Gimmel

Particle	Mass	Gimmel	Total TRUE	Volume
e^-	1	105	106	1,191016
P+	17	7	24	13,824
Totals	18	112	130	$(106.4085\ldots)^3$

Since the Proton has 17 quantum equivalence units of mass and 7 additional units, adding up to 24 Total quantum equivalence units (see Table 15.2), the only way the hydrogen atom can be as stable as the proton is for the atom to have a third component consisting of 38 TRUE, not measurable as mass or energy.

Table 15.5: The Stable Hydrogen Atom (Protium)

Particle	Mass	Gimmel	Total TRUE	Volume
	1	105	106	1,191,016
P^+	17	7	24	13,824
C_z*	0	38	38	54,872
Totals	**18**	**150**	**168**	**1,259,712=108^3**

The calculations require equivalent gimmel to the neutron TRUE score in Deuterium. This satisfies the Conveyance Equation and produces a stable hydrogen atom with a total TRUE unit volume of 108^3. *This suggests that, if gimmel represents consciousness, as we propose, then the Hydrogen atom contains more consciousness than Deuterium and consequently, any other more complex atom containing neutrons.*

Verifying the CoDD Mass of the Hydrogen Atom with Empirical Data: Section 16.

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The mass of the hydrogen atom is well known as 1.0078 atomic mass units (amu). [285] The amount of energy

TABLE 16.1 A: BEFORE: TWO HYDROGEN ATOMS

2 Hydrogen Atoms	Mass	Gimmel	Total TRUE	TRUE Volume
$2e^-$	2	210	212	2,382,032
$2P^+$	34	14	48	27,648
$2C_3$	0	76	76	109,744
Totals	**36**	**300**	**336**	**2,519,424 = $2x108^3$**

TABLE 16.1 B: AFTER: DEUTERIUM AND BETA+ EMISSION

Vortices [aaa]	Mass/ Energy	Gimmel	Total TRUE	TRUE Volume
e^+	1	105	106	1,191,016
ν_e	β*	24 - β	24	13,824
Energy/ Gimmel	-5**	43	38	54,872
Emission Totals	**-4 + β**	**172**	**168**	**1,109,712 = 108^3**
e^-	1	105	106	1,191,016
P^+	17	7	24	13,824
N^0	22 - β	16 + β	38	54,872
Deuterium Totals	**40**	**128**	**168**	**1,109,712 =108^3**
Grand Totals	**36**	**300**	**336**	**2,219,424 = $2x108^3$**

The neutrino and positron are not ultimately changed but play an important role latently [bbb] [286]
When one hydrogen atom bumps into another Hydrogen atom they are electrically neutral, so they don't repel each other, and their two electrons can share the quantized volume surrounding the two protons. This arrangement, however, is problematic because the two protons, being positively charged, repel each other, so they can't combine volumetrically, making the composite vortex unstable. The spinning vortices arrive at a

[aaa] ν_e is the standard symbol for the electron neutrino. e^+ is for the positron.
[bbb] (could this illustrate how the gimmel is the equivalent of a catalyst here coming out unchanged?)

more symmetric configuration by ejecting some mass/energy. Table 16A depicts the 'before' configuration, and Table 16.6 B depicts the 'after' configuration.
In the process, an energetic positron and an electron neutrino are emitted and the very stable deuterium atom, with an electron, proton and neutron is formed. [287; 288 197; 199; 276]

Our early thought was that this is a kind of reverse decay. Many regard the decay of elements only in radioactive decay [196; 197; 198; 199; 257; 276; 289] but this might be a natural necessary process. Teleologically, that makes sense. There is a purpose even in so-called decay. This apparently involves the beta+ and beta- decay as the beginning, lowest level or the first evidence of nucleonic decay.
It becomes very much more complicated with the higher number of electrons and protons in heavier elements, like uranium and so forth (there's a lot more energy that goes off and confounding decay factors).

Our thinking was this: There must be a relationship between the proton and the neutron that may be a kind of negative decay, where you start out with protons but you end up somehow with neutrons. This way any free neutron decay was being replaced. This then becomes a very important common component of these two tables: In physics, this becomes an example of a 'mass balance', because there is no creation or destruction within a finite system of matter or energy [290]; you always have to have the same amount that you started out with. This is because of the conservation of mass and energy. But in this instance, this is a mass-energy-gimmel balance. This implies a different kind of conservation, previously not described.

The first Table 16.1A appears without any radioactive additions. But it does include the extra gimmel instead of the neutron like in Deuterium. [ccc]

The illustrative "before case" involves the two hydrogen atoms –16.1A the before, and where the totals in the Table16.1B "the after", are exactly the same. That illustrates the balance. The "decay" side comes out unchanged but requires the gimmel to do so.

Yet, the process in these tables reflect transitions from two hydrogen atoms to a deuterium atom. In the process, there's a release of energy and in this case a positron e^+ . If it's minus decay, it's an electron. [ddd] It has to do with spin of the vortices. [eee]

The mass contains the mass of v_e the electron neutrino. But since we can only have integers, whatever it is, it has to come out of gimmel. This describes how the *24* – β for the electron neutrino v_e, has balancing amounts for the positron e^+ so effectively the generic algebraic *a +b and a –b cancels out*. [fff]

The mass contains the mass of v_e the electron neutrino. But since we can only have integers, whatever it is, it has to come out of gimmel. This describes how the *24* – β for the electron neutrino v_e, has balancing amounts for the positron e^+ so effectively the generic algebraic *a +b and a –b cancels out*. [ggg]

[ccc] We have called that extra 'gimmel' instead of the neutron by the term 'daled' as we cannot prove it's the same 'gimmel' as in the neptrons (electrons, protons, neutrons).

[ddd] The whole difference between a positron and an electron is their charge: they have the same rest mass but their charge is opposite -/+.

[eee] Embedded in these calculations are the positron and the neutrino. These are reflected in the lower part of Table 8.6A reflecting the after emission totals for the deuterium atom. The difference is the beta that goes in represents the mass/energy that represents the positron. Now we know that energy has to be in multiples of the basic unit. So this has to be 1 even though it will be mass and energy. That's why the heading in there is 'mass/energy' meaning – in most cases mass is represented by 'mev' or C^2.

[fff] In Table 16.1B the total TRUE units are 24 for beta-emission for v_e . The *proton and the neutron and the electron in the lower section add up to 168*, and this is what you get has to add up to 168 as well – otherwise you couldn't come up with the 336 to match the balance with what you began with, the two hydrogen atoms.

[ggg] In Table 16.1B the total TRUE units are 24 for beta-emission for v_e . The *proton and the neutron and the electron in the lower section add up to 168*, and this is what you get has to add up to 168 as well – otherwise you couldn't come up with the 336 to match the balance with what you began with, the two hydrogen atoms.

The neutrino and positron are not ultimately changed but play an important role latently [hhh]
The process in between is how you go from two hydrogen atoms to a deuterium atom, and in the process, there's a release of energy and in this case a positron. If it's minus decay, it's an electron. [iii] [jjj]

The beta decay is regarded as being 1 TRUE unit even though the mass of the neutrino may be much less. In quantized reality, a particle with no mass or energy/mass equivalence should not exist. For experimental reasons, in the past, physicists generally considered the mass of the electron neutrino to be zero. But in 1998, when it was found that neutrinos oscillate between three types, electron, muon and tau neutrinos, physicists concluded that neutrinos must have a very small mass [287; 288] and that it must be less than or equal to a very small, and very specific value, $\beta \leq 0.00012$ MeV/c^2, with a confidence level of 95% [277; 287; 288; 291; 292; 293; 294]
Converting this mass/energy equivalence to TRUE, for the neutrino, calculates at 0.00012/0.511 = 0.00023 TRUE. But the mass/energy ejected in this process must be an integer multiple of TRUE, so β includes the mass of the electron neutrino, but must also include the energy that propels the neutrino away from the atom. How much inertial mass is converted to this energy is unknown at this point, but based on the CoDD TRUE integrals, the total mass-energy ejected must be equal to an integral multiple of quantum equivalence units (TRUE).

The negative units in the mass/energy column indicate mass/energy conversion in the entropic decay process as the hydrogen atoms regain symmetric stability by combining to form a Deuterium atom. This process is known as beta-plus decay [198; 199; 276; 279].

Comparing the before and after totals in Tables 16.1A and 16.1B, we see that the process transforms two hydrogen atoms into one Deuterium atom plus a positron and an electron neutrino and the energy of ejection. However, the total number of TRUE and total volume in the Deuterium atom plus emissions still remain unchanged from the totals before the combination demonstrating conservation of mass, energy and gimmel.

Conservation of mass, energy and gimmel in finite dynamic systems ensures that the moment of inertia of an energy vortex that becomes part of a compound vortex [kkk] is conserved in the total angular momentum. We call this *the law of conservation of TRUE units.* (As an aside, because it's conserved it might reflect a new concept, ordropy, a potential major discussion too and possible fundamental idea).[lll]

Exactly what goes on during the combination of vortices in the beta-plus process is unknown—a sort of "black box"—because there is no way to observe it without disturbing it. As pointed out above, some of the mass that would make up a free neutron, as the combination of one up-quark and two down-quarks, is converted to energy in the process, but at this point, we don't know how much. But we can determine the

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[hhh] (could this illustrate how the gimmel is the equivalent of a catalyst here coming out unchanged?)
[iii] The whole difference between a positron and an electron is their charge: they have the same rest mass but their charge is opposite -/+. It has to do with spin of the vortices.
[jjj] Besides the electron neutrino emitted in the beta+ decay, there are two others: a tau neutrino, which comes from a totally different subatomic reaction, and the muon neutrino is what comes out of a beta- decay, which is the reverse of this. [291; 292]
The positron neutrino is the one that comes out of the opposite, the beta- decay. Instead of getting a positron (p+), you get an e-, which is an ordinary electron.
[kkk] The train of the thought here is that it is a reverse of what we normally think of as an element or a particle decaying. Normally by decay we mean that the particle goes from a mass of X to a mass of X-something. All of the decays you look at, that's why they're called a 'decay'. The strange quarks and the other charm quarks decay by losing mass and decaying into down quarks and occasionally up quarks. So all of a sudden, we have here something that's going in the opposite direction. Just like explaining the mass of the proton, the explanation is in the dynamics of the spin and the angular momentum, *rather than in some magical other particle that is somehow imparting mass.*
[lll] Ordropy is the existence of spatial, temporal or other meaningful *multidimensional* order and patterns, in finite and infinite subrealities, including, but not limited to, negative entropy ("negentropy") (mass-energy plus gimmel).

effective TRUE inertial mass of the neutron in the deuterium atom using information from Tables 16.1A and 16.1B. Thinking further *decay* is a misnomer: It's *not really a decay,* but actually the opposite of that.[mmm]

These two tables are really critically important and they're loaded with information, because spin and charge are closely related. What happens is, the neutron, of the 22, 17 of those are going to be in synch with the proton, and so the number you see there, which is 39 – that's in the mass/energy column for the deuterium total – is just 3 more than what it would be if it were two protons. So that's why, because it's spinning in synch with the proton vortex, the neutron comes off in the deuterium atom as having 1839, because this is where the 3 more units come from.

Consider the following: We know that the neutron has no electric charge associated with it because the charges of the quarks composing it cancel that charge. That means that, as a part of the deuterium atom, the neutron does not add or detract from the spin of the proton of a hydrogen atom; it spins in sync with it. The difference in total mass/energy equivalence from the two hydrogen atoms in Table 16.1A to 16.1B is exactly ***3 TRUE.***

This means that the effective mass/energy equivalence of the neutron in the deuterium atom is the same as that of a proton plus ***3 TRUE****. Thus, the effective mass/energy equivalence of the neutron in combination in the vortex that is the nucleus of the deuterium atom is* ***1836 + 3 = 1839 TRUE****. This makes the total mass/energy equivalence of the deuterium atom,* $\boldsymbol{m_{du}}$*, equal to that of the electron plus the proton plus* ***1839 TRUE.*** *Therefore:* $\boldsymbol{m_{du} = 1 + 1836 + 1839 = 3676\ TRUE}$*. Converting this to amu, we have: 3676x0.511 =1878.436 MeV/*c^2 *= 1878.436/931.49 = 2.017 amu. This corresponds with the total mass and energy in the deuterium atom composed of 2.014 amu mass + 0.003 amu in binding energy* [REF]*. This agrees with empirical data, verifying our result .This conversion from amu to TRUE for neutrons is also the same. These exactly verify the TRUE result based on CoDD triplets .* [232; 285; 295]

As the beta is emitted, some of that mass is consumed as the energy of the emission. Beta + decay conventionally in physics, is a proton turning into a neutron: we know that this particle splits and turns into this particle and that particle and there's energy released. But it's much more complex: W*e're showing based on quantum equivalence units (TRUE units including gimmel) how all of this happens*. The *beta decay is in the gimmel* as well, with 16+ beta there in the gimmel, under the neutron.[nnn] [ooo]

The process in the deuterium atom is not a decay of the neutron as an object by itself, with that free-neutron decaying into what it decays into in about 10-15 minutes.

But that's a free-neutron and if it were free-neutron, then we'd have *no stable atom*, and we'd disintegrate.

[mmm] A speculation: We can **a**pply the conveyance equation due to the application of *Fermat's Last Theorem* . We have to combine them as integers in these equations, and that if they are coming together – and we have demonstrated prior to this exactly what the mass of the proton is due to the spin—1836 TRUE units—and explained why. But then the question is, how come neutrons are only 1839 only three more, and that explanation is less clear. But a neutron not only doesn't have the same charge, it has no charge at all, and it also is heavier – if you just look at the quark, it should be a lot heavier, but in fact it's only 3 units of mass heavier. We propose this is explained in the way that the vortices that make up these forms combine. Yet, we have no definitive way of explaining why the neutron shouldn't be much larger. The answer may be in the way they combine as spinning vortices. When you approach it in this way and you do a *mass balance, then you find that if there's sort of a negative decay* – we're going from a proton, we're 'transmuting' from changing a proton into a neutron.

[nnn] If the physicist accepts the existence of gimmel, that it has to be there in order to make stable entities, subatomic particles – vortices, actually, then he shouldn't have any problem with this because the mass balance has to work out. The Before and After tables show where all of it came from and where it goes.

[ooo] The reverse of this is called 'beta minus decay'. In the 'beta minus decay', the neutron decays into a proton, and that fits the more conventional perception: You're losing mass. But what's happening in this case is, because of the interaction of gimmel and mass and energy, you have the reverse happening: You have some of the energy that goes into the process comes from the mass that becomes the neutron – that's the minus beta in there that makes it balanced.

The neutron is stable here because it is rotating in synch with the proton. They are not separate; they have *merged in the same way that we've seen how the quarks have to merge in order to produce the proton*. And that may be *why the neutron has that strange mass t does in combination in the deuterium atom and in other more complex atoms.* To understand it, you've got to think first of all of the particles not as solid particles—they're vortices spinning parangularly in 3 orthogonal dimensions.

These TRUE numbers might reflect more precision than the conventional LHC data possibly, because:
(1) most of the original atomic derivation numbers come from statistical analyses of terabytes of experimental data from the LHC. (mass and energy); just like the atomic numbers – hydrogen is 1.008 . The point is, they are statistical in nature, they are derived from large amounts including isotopes and inaccuracies possibly.
(2) they haven't used the quantum equivalence units, so some of the units that are involved are inexact to begin with because of fractional measurement units and rounding error. .
Effectively, the mathematics has to be changed basically. The fundamental operations need to be changed to integrals. Addition is the only operation we've really dealt with in these papers, but that's enough to show that just by dealing with them and treating them as integers, we can explain a whole host of things that are inexplicable otherwise.[ppp]

The need for 'decay' in this way is to come out with a *deuterium atom*, which we know we do, starting with two hydrogen atoms. The proof is in the pudding and it all works. We're dealing with 3-dimensional – spins and integer units.

Perspective:

In this discussion, treating elementary particles, hydrogen atoms and deuterium atoms as energy vortices that are comprised of integer multiples of the TRUE. Applying, the quantum equivalence unit of the CoDD, using the previous results, neutrons are formed by beta decay of two hydrogen atoms, and the compound vortex formed this way has an inertial mass of 1839 TRUE, which is in agreement with empirical observations and statistical data from particle physics.

Determining the effective mass/energy equivalence of the neutron by applying the CoDD TRUE analysis to the process known as beta-plus decay, we have gained insight into how elementary vortices and compound vortices combine. We will use this insight in the application of TRUE analysis to the elements of the Periodic Table in the next section. These results can happen both ways because the relevant presence of gimmel allows great versatility. And this is an application of many compound vortices and other elements. Perhaps Einstein's "god is clever, but not malicious" is particularly applicable to decays and subatomic particles that have great meaning.

Application Of TRUE Analysis To The Elements Of The Periodic

[ppp] So the strength of gimmel is just following the logic and by doing so there are very exact answers to the questions. That should persuade anybody who has an open mind to look. A physicist who approaches it as gimmel doesn't exist and none of this is correct, then imposing his mode of thinking within this process; and you cannot do that. We're dealing with integer numbers here and that they all have to balance up.

Table: Section 17.

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"I regard consciousness as fundamental.
I regard matter as a derivative of consciousness." – Max Planck, 1931 [90; 93]

Summary of this section. [246]
From the analyses of Protium and Deuterium, we analyze the first 20 elements. There are patterns with the life elements carbon, oxygen, sulfur, nitrogen, plus magnesium and calcium, plus silicon surprisingly, showing the most gimmel. They have common properties as essential elements in life, plus neon and helium as noble elements.
Hydrogen has far the most gimmel. *Some of the other elements may be invidious but when occurring in combination such as phosphates may perform special life-enhancing functions.*

INTRODUCTION
The hypotheses that the elementary objects making up the universe are energy vortices, not solid particles, and that they combine in ways not addressed in current mainstream physics, has been verified by the production of results consistent with empirical evidence.

We have established that the calculus of Newton and Leibniz [214] is inappropriate for application to quantum phenomena [17; 19; 20; 215] and have replaced it with the calculus of dimensional distinctions (CoDD) [17; 19; 20; 215], using the triadic rotational unit of equivalence (TRUE) derived from the physical characteristics of the electron as the basic unit of measurement and calculation in the CoDD. [296] The TRUE quantum equivalence unit was derived from statistical data obtained from terabytes of data from the Large Hadron Collider (LHC), [209] making the approach much more than just theoretical.

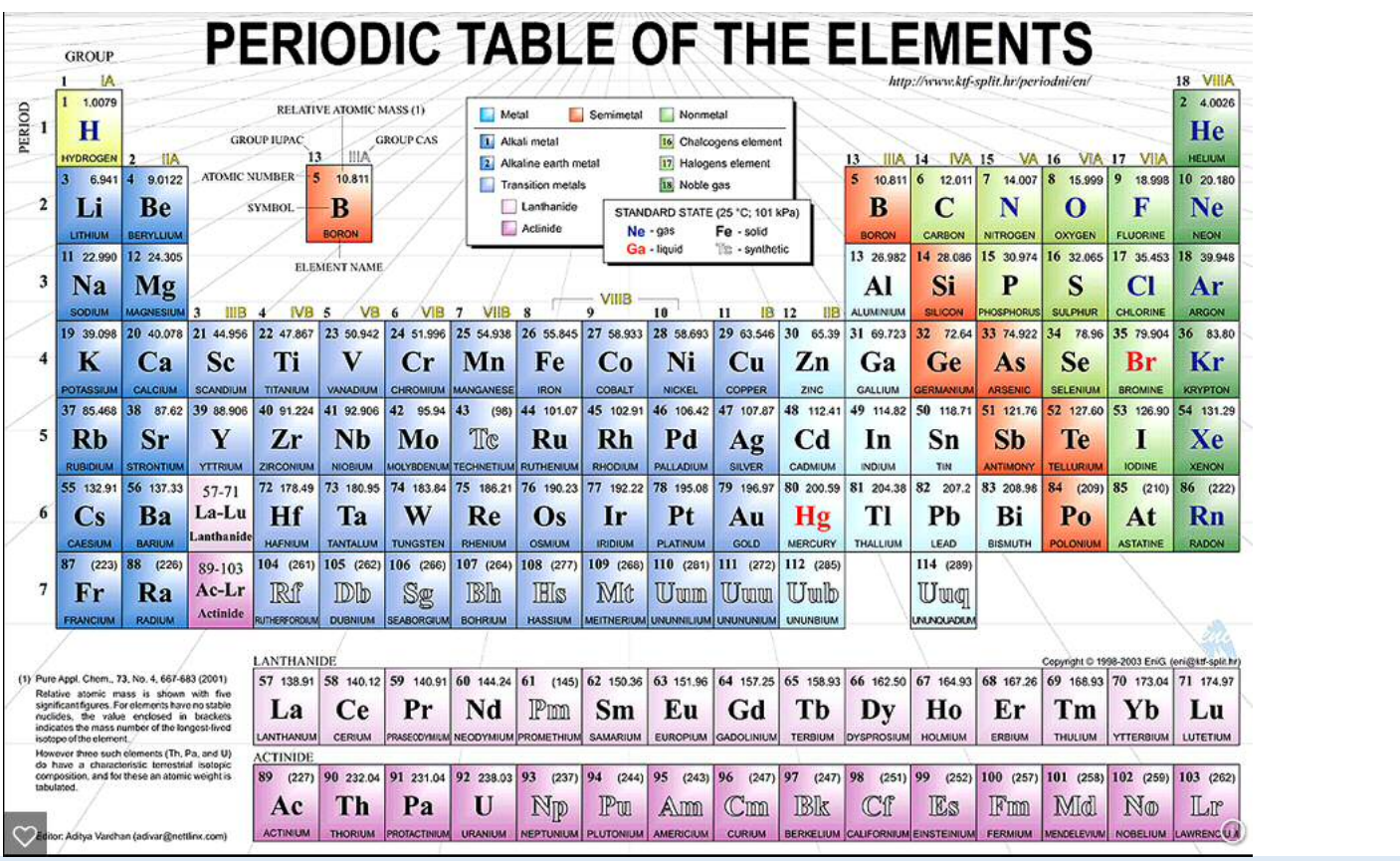
With this approach, the CoDD TRUE analysis, we have explained the intrinsic spin of fermions and derived the inertial mass of the electron, up-quark and down-quark, and calculated the mass/energy equivalences of protons and neutrons, as well as the masses of the hydrogen atom and the deuterium atom. These results are in *very precise agreement with well-established values from many years of experimental data*, [209] proving the validity of the approach including in neutrons [261; 272; 278] and protons. [23; 232] TRUE analysis of the combination of elementary vortices to form the proton led to the discovery of *gimmel*, a non-physical third form of reality. It is the discovery of gimmel that makes this approach a paradigm shift. We have called this new paradigm the Triadic Dimensional Vortical Paradigm (TDVP).

Gimmel, occupying specific volumetric units of TRUE in every elementary vortex, yet with no mass or energy, is necessary for there to be a stable universe. This raises an important question: If gimmel is not mass or energy, what is it? Because specific quantum units of gimmel are part of every integer solution of the Diophantine equations describing the combinations of elementary quantum vortices, it is clear that it has everything to do with the stability of sub-atomic and atomic structure leading to the formation of the physical universe in a way that supports life and living organisms as vehicles of consciousness. The fact that gimmel is necessary for the symmetry that makes the proton so stable that its half-life is longer than the big-bang age of the universe, *would imply that gimmel existed before any atomic structure could form.* Thus, *gimmel is even more fundamental to the existence of the physical universe than mass and energy. If gimmel is consciousness, or even an agent of consciousness, then Max Planck was right: the material world is a*

derivative of consciousness. This suggests that our book Reality *Begins* with Consciousness is aptly titled even when applied in a finite cosmos. [53; 54]

Effectively, these findings introduce the discipline of 'Vortical Physics', as opposed to 'Particle Physics'. In 'Vortical Physics', we are not conceptualizing just (linear) waves and particles, because we're dealing with (three dimensional) volumetric vortical rotations, likely across multiple dimensions, and there is cogent evidence for this being a 9-dimensional quantized (finite, vortical) reality. [46; 65; 66; 141; 142; 143; 297]. This demonstration began with the demonstration that the Cabibbo mixing angle in fermions could be derived only from 9 dimensions. [144; 152; 298; 299] Thereafter there were replications. [qqq] These vortical rotations change the perspective of what we're calling 'discrete particles', and instead involve rotation and movements with angular momentum become pertinent. Dimensional Extrapolation is a calculation technique for this.

Table 17A: Periodic Table of the Elements.



In this section, we will apply the TRUE analysis and what we learned in the previous sections to the elements of the Periodic Table. [2] (Figure 17A)

We begin as before with Hydrogen-1.

The symbol C_∞ indicates that this vortex in this symmetric combination is all gimmel, with no mass or energy. This appears to be unique to hydrogen. The term 'vortex' here refers to rotational movement as opposed to just 'particles' which might imply something less dynamic.

[qqq] Elsewhere, we have discussed the finding and demonstration of a nine-dimensional finite quantized reality.

Table17.1: The Hydrogen Atom (Protium)

Vortex	Mass	Gimmel	Total	TRUE Volume
e^-	1	105	106	1,191,016
P^+	17	7	24	13,824
C_4*	0	38	38	54,872
Totals	**18**	**150**	**168**	**1,259,712=108^3**

Table 17-2: Helium

Vortex	Mass	Gimmel	Total	TRUE Volume
$2e^-$	2	210	212	9,528,128
$2P^+$	34	14	48	110,592
$2N^0$	44	32	76	438,976
Totals	**80**	**256**	**336**	**10,077,696 =(2x108)^3**

Helium is the second most abundant element for a reason that will be explained after the analysis of a number of the elements of the Periodic Table. It is a unique element that is 'noble' and has the same math properties as a life-element.

Table 17-3: Lithium

Vortex	Mass	Gimmel	Total	TRUE Volume
$3e^-$	3	315	318	32,157,432
$3P^+$	51	21	72	373,248
$4N^0$	88	64	152	3,511,808
Totals	**142**	**400**	**542**	**36,042,488; ≥320^3 not a cube root**

Lithium is used medically but can be toxic. It is not a life-element. Beryllium is not a life-element but has a great deal of gimmel.
Lithium, Beryllium and Boron are non-symmetric, and are not found in significant amounts in organic life-supporting compounds.Carbon is the most fundamental organic elements linked with many organic compounds. We would expect carbon to be a life-element and it has that signature namely (N x108)^3 in this instance (6x108)^3

Table 17-4: Beryllium

Vortex	Mass	Gimmel	Total	TRUE Volume
$4e^-$	4	420	424	76,225,024
$4P^+$	68	28	96	884,736
$5N^0$	110	80	190	6,859,000
Totals	**182**	**528**	**710**	**83,968,760 = (437. 8976)^3 .**

We continue by examining Boron, as the next in the sequence of increasingly complex elements. We see that Boron is also asymmetric with vale

nce electrons and is therefore not as stable as Hydrogen or Helium.

Table 17-5: Boron

Vortex	Mass	Gimmel	Total	TRUE Volume
$5e^-$	5	525	530	148,877,000
$5P^+$	85	35	120	1,728,000
$6N^0$	132	96	228	11,852,352
Totals	**222**	**656**	**878**	**162,457,352**

Table 17-6: Carbon

Vortex	Mass	Gimmel	Total	TRUE Volume
$6e^-$	6	630	636	257,259,456
$6P^+$	102	42	144	2,985,984
$6N^0$	132	96	228	11,852,352
Totals	**240**	**768**	**1,008**	**272,097,792= $(6x108)^3$**

Table 17-7 Nitrogen

Vortex	Mass	Gimmel	Total	TRUE Volume
$7e^-$	7	63	70	408,518,488
$7P^+$	133	35	168	4,741,632
$7N^0$	161	7	168	18,821,096
Totals	**301**	**105**	**406**	**432081216 = $(7x108)^3$**

Table 17-8: Oxygen

Vortex	Mass	Gimmel	Total	TRUE Volume
8e	8	840	848	609,800,192
$8P^+$	136	56	192	7,077,888
$8N^0$	176	128	304	28,094,464
Totals	**320**	**1,024**	**1,344**	**$644,972,544=864^3$ = $(8*108^3)$**

Carbon, Oxygen and Nitrogen are symmetric, stable, and essential to the development of life-supporting organic compounds. Oxygen is the key gas to sustain life.

Fluorine is asymmetric properties as the life elements, but because its electron shells are full, it is inert. But it is only Helium and Neon of the noble elements that show this property.

Table 17.9 Fluorine

Vortex	Mass	Gimmel	Total	TRUE Volume
$9e^-$	9	945	954	868,250, 664
$9P^+$	153	63	216	10, 077, 696
$10N^0$	220	160	380	54, 872, 000
Totals	**382**	**1,168**	**1,550**	**$(977, 218…)^3$**

Table 17-10: Neon

Vortex	Mass	Gimmel	Total	TRUE Volume
$10e^-$	10	1050	1060	1,191,016,000
$10P^=$	170	70	240	13,824,000
$10N^0$	220	160	380	54,872,000
Totals	**400**	**1,280**	**1,680**	**1, 259, 712, 000= ($10* 108^3$)**

Table 17-11 Sodium

Vortex	Mass	Gimmel	Total	TRUE Volume
$11e^-$	11	1, 155	1, 166	1,585,242,296
$11P^+$	187	77	264	18,399,744
$12N^0$	264	192	456	94,818,816
Totals	**462**	**1,424**	**1,886**	**$(1,193.12…)^3$**

Sodium is a very common element but it is not a life element. It can be toxic.

Table 17-12: Magnesium

Vortex	Mass	Gimmel	Total	TRUE Volume
$12e^-$	12	1, 260	1, 272	2,058,075,648
$12P^+$	204	84	288	23,887,872
$12N^0$	264	192	456	94,818,816
Totals	**480**	**1, 536**	**2,016**	**$(12X108)^3$**

Magnesium is a life-element. It is fundamental and ubiquitous.

Table 17-13: Aluminum

Vortex	Mass	Gimmel	Total	TRUE Volume
$13e^-$	13	1, 365	1,378	2,616,662,152
$13P^+$	221	91	312	30,371,328
$14N^0$	308	224	532	150,568,768
Totals	**542**	**1,680**	**2,222**	**9,702,973,560 = 1,409.057 ^{3}**

Aluminum (Aluminium) is an important element but it is not a life element. It can be toxic.
Silicon, for many, would be a surprise. Why is that a life-element?
But if it is shown to be part of life that would support the hypotheses.
As it happens, there is cogent but preliminary data showing certain marine life has silicon instead of carbon as part of its fundamental structure.

Table 17-14: Silicon

Vortex	Mass	Gimmel	Total	TRUE Volume
$14e^-$	14	1, 470	1, 484	3,268,147,904
$14P^+$	238	98	336	37,933,056
$14N^0$	308	224	532	150,568,768
Totals	**560**	**1, 792**	**2, 352**	**$1,512^3=(14x108)^3$**

Table 17-15: Phosphorus

Vortex	Mass	Gimmel	Total	TRUE Volume
$15e^-$	15	1,575	1, 590	4,019,670,000
$15P^+$	255	105	360	46,656,000
$15N^0$	352	256	608	224,755,712
Totals	**622**	**1, 936**	**2, 558**	**$(1625.008…)^3$**

Sulfur is a critically important life-element. Chlorine though common can be toxic.

Table 17 -16: Sulfur

Vortex	Mass	Gimmel	Total	TRUE Volume
$16e^-$	16	1, 680	1, 696	4,878,401,536
$16P^+$	272	112	**384**	56,623,104
$16N^0$	352	256	608	224,755,712
Totals	**640**	**2, 048**	**2, 688**	**$16x(108)^3$**

Table 17 -17: Chlorine

Vortex	Mass	Gimmel	Total	TRUE Volume
$17e^-$	17	1785	1802	5,851,461,608
$17p^+$	289	119	408	67,917,312
$18N^0$	396	288	684	320,013,504
Totals	**702**	**2192**	**2894**	6,239,392,424 so 1840.97^3

Table 17 -18: Argon

Vortex	Mass	Gimmel	Total	TRUE Volume
$18e^-$	18	1890	1,908	8,096,384,512
$18P^+$	306	126	432	80,621,568
$22N^0$	484	352	836	584,277,056
Totals	**808**	**2368**	**3,176**	8,761,283,136

Argon is an example of an inert element that is not a life element. It is larger than He and Ne.
We would not expect potassium to be a life-element though very reactive.
Calcium, like Magnesium, is a life-element. It is fundamental and ubiquitous.

Table 17 -19: Potassium

Vortex	Mass	Gimmel	Total	TRUE Volume
$19e^-$	19	1,995	2,014	8,169,178,744
$19P^+$	323	133	456	94,818,816
$20N^0$	440	320	760	438,976,000
Totals	**782**	**2448**	**3230**	**2056.944 [3]**

Table 17 -20: Calcium

Vortex	Mass	Gimmel	Total	TRUE Volume
$20e^-$	20	2,100	2120	9,528,128,000
$20P^+$	340	140	480	110,592,060
$20N^0$	440	320	760	438,976,000
Totals	**800**	**2,560**	**3,360**	**10.077,696,000 = $(20x108)^3$**

Discussion:
A rotating object is symmetrical if it has no asymmetrical features around the axes of rotation. Everything is symmetric about the rotational axis. A cube is perfectly symmetrical – that's just one of the Platonic forms, but rotating or spinning objects, means they're perfectly symmetrical about their axes of rotation: they would occupy a perfectly symmetrical sphere in space if space were continuous. (Even imagine a cube spinning, it would occupy a symmetrical volume). This is explained through where *things approach the maximum speed of the angular velocity of C, the sphere becomes effectively a cube . But anything rotating is perfectly symmetrical about the axes of rotation otherwise it would fall off and become unstable.*

Applying TRUE analyses to the first twenty elements of the Periodic Table, we see that the elements that make up the most basic compounds of organic life, and the compounds that support organic life, contain the highest percentages of gimmel, and *they are symmetrically stable*. They are Hydrogen, with **89.3% gimmel**, Carbon, Nitrogen, Oxygen, Magnesium, Sulfur, and Calcium, each with **76.2% gimmel**. They are highlighted in the Table 17-21. Next, in importance to organic life forms, are Helium, Neon and Silicon, *also with 76.2% gimmel and symmetrically stable*. They are not required in the basic compounds of life-supporting compounds but are critical to their development. By inspection of Tables 17-2, 6, 7, 8, 12. 18 and 20, we see that all the elements critical to life-supporting compounds are symmetrically stable bound multiples of Helium, the first atom with 2 electrons, 2 protons and 2 neutrons. Neon and silicon are in this group of elements critical to life-supporting compounds because they might play a role like Helium does in forming more complex life-supporting elements farther along in the Periodic Table.

We can now summarize the percent gimmel, symmetries and asymmetries in the first 20 elements of the Periodic Table. [176]
To this point, all the elements discussed are symmetrically stable (YES in the right-hand column of Table 17.21), and all contain **76.2%** gimmel except for Hydrogen with **89.3%**.

The next highest in gimmel is Potassium, and Phosphorus with **75.9%** followed by Chlorine with **75.7%**. These elements are not symmetrically stable themselves, but readily combine with other elements to form compounds that are vital to the health of organic life. All the non-symmetrical elements are, by themselves, poisonous or detrimental to life in some way. But, they occupy important spots in the order of the Periodic Table with high levels of gimmel because they help form more complex elements or compounds that are important to life. For example, Aluminum, the next highest in gimmel after Chlorine, with **75.6%**, causes

problems for organic life forms by itself, but, in a double bond, forms Iron, an element which is a critical in the blood of all mammals, including human beings. This should be enough to show that symmetric atomic stability and the presence of gimmel determine the position of the natural elements in the Periodic Table and their roles in the development and support of organic life, the vehicle of consciousness.
Some would expect that Phosphorus would be a life element: But it is Phosphate PO_4 that is fundamental not phosphorus. Phosphate reflects the energy packets and Phosphorus is in DNA. Phosphorus may be important as reflecting energy packets.

Table 17-21: Percentage Gimmel

Atomic Number	Element	Gimmel in TRUE	Total TRUE	Percent Gimmel	Z^3 Symmetrical?
1	**Hydrogen**	**150**	**168**	**89.3%**	**YES**
2	**Helium**	**256**	**336**	**76.2%**	**YES**
3	Lithium	400	542	73.8%	NO
4	Beryllium	528	710	74.4%	NO
5	Boron	656	878	74.7%	NO
6	**Carbon**	**768**	**1008**	**76.2%**	**YES**
7	**Nitrogen**	**896**	**1176**	**76.2%**	**YES**
8	**Oxygen**	**1024**	**1344**	**76.2%**	**YES**
9	Fluorine	1168	1550	75.4%	NO
10	**Neon**	**1280**	**1680**	**76.2%**	**YES**
11	Sodium	1424	1886	75.5%	NO
12	**Magnesium**	**1536**	**2016**	**76.2%**	**YES**
13	Aluminum	1680	2222	75.6%	NO
14	**Silicon**	**1792**	**2352**	**76.2%**	**YES**
15	Phosphorus	1936	2558	**75.9%**	NO
16	**Sulfur**	**2048**	**2688**	**76.2%**	**YES**
17	Chlorine	2,192	2,894	75.7%	NO
18	Argon	2,368	3176	74.6%	NO
19	Potassium	2,448	3,230	75.9%	NO
20	**Calcium**	**2,560**	**3.360**	**76.2%**	**YES**

We began by developing TRUE quantum units for a quantum calculus from the very accurate and detailed data provided by the Large Hadron Collider. By applying TRUE analysis to the elements of the Periodic Table, we have shown how physical reality is elegantly devised to develop and support life capable of manifesting consciousness and intelligence. We have now completed the circle by showing how this analysis explains phenomena and data not included in the data from which it was developed. Because it is based in empirical data and verified by empirical phenomena, this paradigm is no longer a theory, it is now a paradigm shift to a new science that is verified by empirical data, a new science that brings new information, not revealed by the current mainstream paradigm, to light. And this is just the beginning.

The Proof is in the Pudding: Section 18.

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The simple straight-forward application of the Calculus Of Dimensional Distinctions [19] to the combination of quarks that forms protons [122], explained things that the current mainstream standard model does not explain, and revealed some surprising new science: it explained why the quark mixing angle [144; 152; 298] (called the Cabibbo angle after Italian physicist Nicola Cabibbo [300]) has the precise value it does (13.04 ± 0.05 degrees); why quarks combine in groups of three (triads), not two or four [2], and it answered why there is something rather than nothing [2] (The question that the German polymath, Gottfried Leibniz [301], believed was the most important puzzle for science to solve.) **[302]** It also explained why fermions (the particles that make up ordinary matter) have an intrinsic ½ spin [46; 144; 297; 303], and it revealed the third form of the substance of reality [102; 103] in addition to mass and energy that is necessary for the formation of stable sub-atomic and atomic structures.

Recognizing pure mathematics as a reliable reflection of the basic foundational structure of reality, has led to the discovery that reality is accurately modeled with nine finite dimensions [147; 148; 304; 305], with three forms of substance, mass, energy and *gimmel* (again, the arbitrary name we gave the third, non-physical form of the substance of reality based on the bridge that is the third letter of the Hebrew alphabet) [4]embedded in an infinite *conscious* substrate, the source of all forms and mathematical systems [175] of logic known as "the Laws of nature". [133] Indeed, our foundational work apparently unifies all of reality—Quantal, Macro-world with life and physical experience, and Cosmological. It also allows for explaining life [26; 306; 307] and biology [308]. This appears to be a real metaparadigm —theory of everything [65] and unified theory. *If that is so, it is a profound landmark in the history of mankind, and of science. With Unified Monism philosophy, it extends to philosophy.* [13; 109] There are aspects still to show, for example, unification of electromagnetism and gravitation.

This model tied to the reality of the electron, is reflected in the structure of pure number theory, TRUE analysis [155] of the elements [22; 23; 309]of the periodic table revealed the fact that the main elements supporting life contain significantly more gimmel than other elements.(besides the small Noble ones: Helium and Neon). [2] This strongly supports the idea that organic life is a guaranteed outcome of evolution in the physical universe, the reason and purpose of cosmic change, and not an accident as posited by mainstream science.

Finally, if we recognize that non-physical gimmel is an agent or vehicle of consciousness, acting as the organizer of physical reality, and that it is in direct contact with the infinite conscious substrate, then mental or spiritual virtue, is revealed as the actual driving force behind all consciousness-advancing evolution. This realization is not identical with the teachings of any specific religion or religious organization, but it resonates with the Leibnizian "perennial philosophy" which some interpret as, the heart and soul of all true religion and science, referring to eternal divine reality. Aldous Huxley brings together selections from world theologies and spiritually enlightened men and saints, mystics, and poets to illustrate these aspects of this reality. in his 'anthology that is above all a masterpiece of discrimination', T*he Perennial Philosophy*. [310]

However, there are some clarifications of the TDVP model we need to make. This is summarized in our many publications and in RBC5. We briefly summarize.

Perspective of Quantum Calculus and Mass: Section 19.

Edward R. Close, PhD, PE, DSPE, DF(ECA)
Vernon M Neppe MD, PhD, FRS (SAf), DFAPA, DPCP (ECA) DSPE

We put Part 2 of this lengthy article all together succinctly in a few paragraphs.

Historical Background and Need for a Quantum Calculus

First mathematics should not be divorced from natural science and divided up into separate academic disciplines, because *mathematics actually reflects the innate logical patterns underlying reality*. Math is not just an operation or for calculating. It is fundamental to our universe, There is significant empirical evidence [142; 143; 152; 175; 311] to support it: [302] We argue that it is time to re-unite mathematics, logic and the natural sciences, in a way that will allow the scientific study of all aspects of the reality we experience, including mental and spiritual reality [142; 143; 152; 175; 311]. Modern mainstream science has not yet fully understood the revolutionary ideas of Planck [94] and Einstein in physics, and Gödel [312] and George Spencer Brown [313] in mathematics and symbolic logic.

In spite of the dream of a theory of everything, there has been no paradigm shift since the discoveries and new mathematics of Einstein [216] and Planck [142; 143; 152; 175; 311], Bohr [314] and Schrödinger [315] Mainstream physicists have been content to just "fill in the holes" as the physics professor told young Max Planck [90] in the 1870s. That's exactly what finding the Higgs boson [208], gravity waves [316], and mapping more of the universe from the Hubble and Planck Probe data are. [157; 158] These fill in the holes in existing theories. With respect, the next real paradigm shift is found in the Neppe-Close model, [316] called the Triadic Dimensional Vortical Paradigm (TDVP) [54; 165]. We demonstrate that when you apply a mathematically proven 9-dimensional quantized finite volumetric reality everything including quantum weirdness fits into place. The 60 plus dilemmas that cannot be explained by Quantum Physics all disappear and further extends to the macroworld of our physical reality [8; 147] plus cosmological dark matter and dark energy. [28; 105]
This is not a speculation as it is empirically demonstrated: TRUE calculations are exactly equal to the normalized LHC data with electrons as 1, protons as 1836 and neutrons as 1839.

This changes the whole: 4D experience is different from 9D finite with infinite existence. The jigsaw puzzle analogy is a good one. We must fit all pieces that we can do, not just the pieces that fit 3S-1t. incorporating consciousness into the laws of nature, we can ultimately demonstrate that the finite is embedded in the infinite. [28]

Development of a Quantum Calculus for Quantum Reality

We have created a step-by-step development of a mathematical/logical system tethered to reality by using the measurable and computable characteristics of the electron, the smallest mass in all hadronic matter (the ordinary stuff that makes up the bulk of the universe) as the natural basic quantum equivalence unit. This unit, called the Triadic Rotational Unit of Equivalence (TRUE), is derived from the Large Hadron Collider (LHC) data, using the principles of quantum physics [28] and relativity. [222] Once developed as a consistent logical calculus, the Calculus Of Dimensional Distinctions (CoDD) [17; 19; 20] is used to model the combination of elementary entities to form protons, neutrons and all of the elements of the periodic table. [28]

The role of the infinite continuity, consciousness and the spiritual in moving towards a unified theory applying the Neppe-Close Triadic Dimensional Vortical Paradigm (TDVP):

Balancing the math and physics with the broader fabric: Section 20 (Part 3). [rrr]

Vernon M. Neppe MD, PhD, FRSSAf and Edward R. Close PhD

Abstract: This multisection discussion shows how science and spirituality are not separate domains but are strongly linked by applying the Neppe-Close Triadic Dimensional Vortical Paradigm (TDVP). They fit too with the mathematical physics we've discussed above. This gives a holistic perspective. [317]

There are 12 remarkable, at times, ground-breaking scientific TDVP findings and demonstrating how these discoveries relate to the infinite continuity. These have been published in detail elsewhere but are listed for perspective and include:

- The infinite continuity plays a critical role in existence, life, and order.
- Materialism at the atomic level is refuted.
- We necessarily exist in a vortical reality, continuously rotating through finite, quantized, volumetric 9-dimensions, embedded in the infinite.
- Gimmel, a third agent besides mass and energy, is in union with all stable particles and atoms with mass and energy.
- Gimmel is necessary for the stability of atoms and of our cosmos.
- TRUE units (including gimmel, mass and energy) are a necessary pattern in our triadic nature.
- We have jokingly called Gimmel the 'G-d Matrix' as it is linked with the infinite continuity and the quantized finite.
- The laws of nature are unified.
- We need to extend our scientific boundaries by applying feasibility.
- TDVP is a theory of everything that works.
- Mathematical logic is the central feature of reality.
- Impact and influence imply theism.

There are also some major significant topics linked with TDVP: [70 8]

- Consciousness and how impact and influence are critically relevant.
- The wondrous findings pertaining to gimmel, allows stability in the universe. Gimmel is a possibly mystical massless, energyless third component in union with mass and energy.
- Unified Monism: This unique mind-body model involves unification of everything and implies major spiritual implications, yet UM works even in our physical reality: The infinite enveloped in the finite,

[rrr] This Part 3 is heavily based on the lengthy article How science and spirituality can be unified by the Neppe-Close Triadic Dimensional Vortical Paradigm (TDVP). It is the key element in discussing reality recognizing the infinite continuity, spirituality and consciousness outside the brain.

unify one essence.

- Kabbalah and Jainism exemplify some of the remarkable links of science and spirituality: A highlight is the first three verses of Genesis
- the unification of the laws of nature is paradigmatic.
- The neglected area of order and ordropy shows why entropy is likely very limiting: *The concept of conservation of gimmel means that nothing is lost in our world, also implying that immortality is important.*
- Limited freedom of will is highly compatible with spirituality; this recognizes precognition statistically, but allows for free-will, and choosing good or evil.
- The new discipline the authors introduced, dimensional biopsychophysics, illustrates approaching dimensions, infinity, meaning, and understanding in spirituality and the laws of nature.
- The new Neppe-Close Lower dimensional feasibility, absent falsification (LFAF) concept of feasibility in science is critical for expanding science because consciousness and multidimensional time are beyond 3S-1t and fit the 9D quantized volumetric rotating finite.
- The 'spiritual' has not been recognized because scientists need to apply the concepts of multidimensionality, consciousness, infinity, scientific feasibility, and the transcendent.

These sections demonstrate that science is not only perfectly compatible with the mathematical physics but that the two disciplines can contribute further to one another.

TDVP: Its place in the Unified model and Metaparadigm: Section 21.

Vernon M. Neppe MD, PhD, FRSSAf, DPCP(ECAO), DSPE and Edward R. Close PhD, PE, DF(ECAO), DSPE.

How do you conceptualize TDVP?

TDVP represents the strongest attempt ever at developing a unified theory. It can be characterized as a 'metaparadigm' though few know the term, but that is better than the Theory of Everything [65; 67] that it is demonstrably far, far better than 2 dozen other TOEs. TDVP is a Unified Model because it has mathematical and empirical proofs. But it's incomplete at present because the biggest single problem with complete unification *is incorporating gravitation with electromagnetism*. Nobody has been able to do that. They've not been able to do it because they work on 3S-1t. But the opportunity is there to complete the model; Everything remaining is available for explanation because of the 9-dimensional quantized finite vortical volumetric model embedded into the infinite continuity. Consciousness has been previously ignored: it's a major player. A good starter is the TDVP realization that particles are not even particles and that they are rotating vortices through 9 dimensions – the *biggest problem might be that we should not apply 4D ideas into 9D+ (9 dimensions plus the infinite). We may* easily be able to incorporate electromagnetism, gravitation, the strong and the weak forces – and perhaps the strong and the weak forces are all part of this as one force. It's just a unified force in a different way relative to the context (where dimensionally, for example) and dynamic: It's not static. I think one can put that all together into a Unified Model in 9D plus. And we must go beyond our 4D physics thinking. For example, a Systems approach might be needed. [29]. We

need to think differently perhaps in the 'ethicospirituobiopsychofamiliosocioethnicocultural' context [29] [54] and recognize the transpersonal approach. [318]

The term 'Unified Model' or 'Unified Theory' has become more fashionable than calling it a Theory Of Everything, and few have caught on to the idea of a metaparadigm. But this is what it's all about [7]: the understanding of reality. I don't like to push this to the extent that we haven't even really mentioned it much here – but to me the most fundamental level of consciousness is the one Neppe developed because it recognizes that Consciousness must be conceptualized only by applying many prongs (at this point, a dozen).

TDVP is in a unique position to be able to deal with a unified model. You've got to involve the systems theory, which it does, and obviously you've got to involve the dimensional biopsychophysics, you've got to involve the biology including explaining life beyond physical existence too. You've got to recognize that most of consciousness is extra-dimensional in terms of outside 3S-1t and extra-cerebral at that is outside the brain and covertly expressed. Those elements are unexplained or ignored by 4D scientists. Those who use the multidimensional (and there are thousands of scientists like this), follow the crowd and focus on The String Theories —the Strings are all theories because they're not provable [56; 57; 58; 59; 153], and likely cannot be because they're likely wrong!

So those in Dimensional Biopsychophysics researching TDVP have the opportunity to succeed when no-one else can. For example, in TDVP, we recognize the phenomenon of 'indivension'. [228; 319] Indivension describes the process of moving across, between and within dimensions, and interfacing across different levels of individual-units. It also describes the limited, relative and fragmented views of reality afforded by the physical senses of different sentient beings. [165] Indivension can be horizontal across individual-unit systems, or vertical across and within dimensions.

Exploring Meaning in Science through TDVP: Section 22

Vernon M. Neppe MD, PhD, FRSSAf and Edward R. Close PhD

The well-known mainstream physicist, Stephen Hawking [320; 321; 322; 323] tried to develop a theory of everything, but left out four major features: Consciousness, Dimensionality, Infinity and maybe just maybe …… and as scientists dare we say anything?…God. He is not alone. Of the twenty-six known attempts to develop theories of everything, very few include even the four features that are key to understanding everything, namely Consciousness, Extra dimensions, Infinity, and a scientific approach.

Einstein said, *"I want to know God's thoughts—the rest is just details."*
Even more, Albert Einstein pointed out that *"Science without religion is lame. Religion without science is blind."* [254]

Max Planck, Nobel Laureate and discoverer of quantum physics, believed that there is an infinite intelligence behind the phenomena that make up the observable universe. We're very much indebted to these two great men, who dared break the barrier into the spiritual aspects of reality, because spirituality is the fifth feature that must be added to the current scientific paradigm, and all five must be developed from empirical data and proved mathematically.

Einstein didn't seek a theory of everything until the last twenty years of his life but he started us down the

right path. He adapted Hermann Minkowski's 4-dimensional space-time as the geometry of relativity [86; 216; 223; 225]: The theory of relativity has been successful to a large extent because the mathematics of 4-dimensional geometry more closely reflects reality than does the mathematics of 3-dimensional geometry. [225 226] We know now that reality is multidimensional, and consciousness, as experienced mentally, is the doorway to these extra dimensions.

Several other physicists—notably Oskar Klein, Theodor Kaluza and Wolfgang Pauli [324; 325; 326]— carried this line of reasoning further by using 5-dimensional models and they had success; but for several reasons they didn't go farther with this. Their contributions to a powerful new paradigm were in the recognition of extra dimensions. [54] Rauscher and Targ extended this and even used an 8-dimensional model and recognized consciousness but not infinity. [327]

However, the prior quantum physics models fail to adapt fully to the empirical fact that even the four-dimensional (3S-1t) physical reality we live in is quantized—it's made up of *discrete* elements, like pixels on a TV or bits on a computer, but these components are actually *three dimensional—they're volumetric*. [54]

An example is the most studied multidimensional model namely, String theory, with its many different variants, including superstrings [55; 56; 57; 58; 59; 153]. It has become very popular, and thousands of physicists have worked with it, but it has not yielded very much. All the variants remain 'theories'. And again, none include consciousness; and time is barely involved; and certainly not infinity. Extra dimensions are necessary in order to explain quantum mechanics and the most successful of current string theories involves multiple extra dimensions, but string theory models have failed to relate the nature and structure of these extra dimensions of reality to the nature and structure found in pure mathematics: Ad hoc foldings or curlings of extra dimensions do not work, but it turns out that multi-dimensional vortices with spinning movements in at least three dimensions do work. But of course, these models have to be empirically and mathematically sound too, which, other than TDVP, none of the 26 models evaluated have proven to be.

The Triadic Dimensional Vortical Paradigm model developed in 2011 by the authors, Dr. Vernon Neppe and Dr. Edward Close [328], has filled all these criteria. In fact, in their initial analysis of 24 models applying 39 stringent criteria for a Theory of Everything, the TDVP model scored a perfect 39/39, more than double the score of any competitor other than the still flawed original Neppe (29/39) and Close (23/39) models. [52; 106; 329] TDVP now scores a perfect 62/62 [328]. This is one reason why we have used this work in our exploration of Science in Spirituality.

Unification of science and spirituality [4; 25; 330; 331]

There is no logically consistent way to merge the usual physical 3S-1t [sss] experience alone with spirituality. They are quite separate in a 4-D space-time model as 3S-1t does not contain a symbolic representation of consciousness: Consciousness requires a higher dimensional representation than Space and Time.

Nevertheless, when we extend the scientific model to 9 dimensions, and also to include infinity, the results are crucially different. This new approach to science can be accomplished by applying the new technique of LFAF and by so doing amplifying scientific feasibility [14; 44; 82; 332, 81].The spiritual then fits, unlike the idea of Gould's Magisteria where science and spirituality were perceived as fundamentally different categories of things. [125].

The likelihood increases that the TDVP model is broadly correct with each discovery. And this has been

[sss] 3 dimensions of space (length, breadth, height) in a moment in time (the present). Our experience is usually restricted 3S-1t (e.g. we cannot directly experience X-rays or gamma rays or ultrasound or the hyperolfaction of dogs or the echolocation of dolphins.

repeated over nearly a decade now, yet it is largely unchallenged and never been disproved. Yet, sadly, but not surprisingly, this is the typical history of groundbreaking endeavors. The Neppe-Close contributions have been largely ignored by many colleagues: with excuses such as *"it's too difficult", "I'm not so trained",* and *"it's too wrong to be wrong",* or Wolfgang Pauli's famous response to his then student, later eminent physicist, Victor Weisskopf (translated to) "*This is not even wrong*". [333] These kinds of comments reflect the onset of the typical Thomas Kuhnian progression, describing how *scientific revolutions* begin with denial of what is not 'normal science'—new, 'unscientific' ideas—then much later, the final, fifth phase concludes with acceptance of new norms [206]. Kuhn described the 5 stages as: '1. The pre-paradigm phase; 2. Normal Science; 3.Crisis Phase; 4. Paradigm Shift; and 5. Post-revolution.' In 2016, this Kuhnian Revolutions Model was extended by Neppe and Close [15; 334] into the *'11 Neppe-Close Revolutions model'* (11NCR). 11NCR filled in gaps and the extended 11NCR has a particular emphasis on Kuhn's middle phases 2 through 4. 11NCR describes the scientists' progression in their stages of understanding of the revolutions of change—the reshaping of science—by adding several more stages along the way from Phase 3 to Phase 5, producing eleven key periods of adjustment [(p12), 15, 71] Arthur Koestler summarized the situation well, and we quote here, without meaning to offend, because it's logical to be careful with new data, and even to reject the ideas, but only after thorough evaluation: [89]

> *"Innovation is a two-fold threat to (some) academics: it endangers their oracular authority; and it evokes the deeper fear that their whole laboriously constructed intellectual edifice may collapse."*

Persuasion of others is indeed difficult. But unifying science and spirituality is a major and critically important task.

We begin then with the major prevailing concept today in science, which is one of Gould's 'Non-overlapping magisteria' in which science and religion each represent different areas of inquiry, fact vs. values. In Gould's model, the two domains do not overlap. [124; 125]. In this paper, we oppose this view based on the findings of empirical science and mathematics. We argue that applying our TDVP model and examining the data, we can often confirm that the spiritual is valuable as an addition to understanding science.

Science and neutrality: spirituality?

We are discussing the linkage of *science and spirituality*. More specifically, TDVP must then be perceived as having meaning and purpose. Despite it being a scientific model—and it could be argued science should be neutral—the discovery of gimmel [3], and of extra higher dimensions embedded in infinity may be envisioned as involving a mystical component. Additionally, Gimmel might be a non-physical, previously-undiscovered third agent; the extra dimensions have parallels with the Kabbalah [126] and other mystical traditions; and the infinite has been a largely unexplored realm in mathematical physics.

Moreover, the significant purpose of TDVP could be argued to be more than just a more comprehensive scientific model: it is a *paradigm shift*, allowing a certain latitude in classifying where it fits. The higher dimensional domains are different from the physical world we perceive with the limited senses. These higher *dimensions* involving *consciousness* ultimately lead to an *infinite domain* creating a unique triad in the 'theories of everything'.

Moreover, we are dealing with distinctions—a logical, mathematical calculus of distinctions [17; 19; 20;60; 154; 181; 193; 309; 335; 336; 337; 338; 339; 340]—that emphasize *impact*, and therefore emphasize change. And that change in *influence* might introduce a significant change to *theism*—a divinity that acts, as opposed to a *deistic divinity* who creates and then has no involvement.

So though science should be *neutral*, TDVP perceives a meaningful progression—a progression at a higher dimensional level with a higher consciousness—ultimately benefiting sentient beings. TDVP is able to recognize the remarkably purposeful design in our world: Applying 'Lower Dimensional Feasibility, Absent Falsification' (LFAF) [14; 44; 82] we might even recognize contradictions in the scientific feasibility of 'simple evolution'—evolution at a physical level without the expression of some 'intelligence'—possibly a 'meaning', a necessary massless, energyless third component (gimmel). Further, gimmel might have preceded the formation of matter and energy in the Big Bang or equivalent 'origin event'.

In the same way, one could argue that beauty is "in the eye of the beholder", that beauty is completely neutral. But the whole design, the whole fabric, even within the mathematics, is more than a beauty: There's a meaningful component, and there is a component that also links up Biblically, even with the first three sentences of Genesis, with Kabbalah, with $E=Mc^2$, and with fabrics pertaining to consciousness which we can interpret in those three sentences.

Again, this might be the Greater Reality: Perhaps a "Consciousness" outside of our brain.

Are these remarkable discoveries correct? They appear to be so mathematically and empirically. Mathematics is not an accident just for calculation. We opine like some others including Plato and Pythagoras, that math is part of our fundamental reality.

For us, this paradigm shift has been a series of remarkable inspirations and sometimes epiphanies, with certainty about what is correct and with the logic and sequencing of each discovery providing further confirmation of what was discovered before. Many times Dr. Edward Close and Dr. Vernon Neppe have had the same independent realization at almost the same time, 2000 miles away, quite independently and yet in a remarkable manner.

Do these findings simply follow the laws of nature but in accordance with reality higher than our usual physical 3 dimensions of space in one moment in time—the present?

Respectfully, we're most familiar with our own past and present findings so we can discuss these more than other models. We dare to discuss our TDVP and related models in detail here because, to us, they reflect spirituality, science and math more than other models. Two colleagues who have studied our findings in detail over the past decade.

In our prologue, we mentioned Drs. Stewart and Klein, the two scientists who've most studied TDVP. Here are some more of their refereed comments.

Dr. Adrian Klein, Israel, Dimensional Biopsychophysicist and Consciousness Researcher:

- "*The 21st Century's revolutionary paradigm shift";*
- *"… unprecedented brilliance and potentially limitless scientific and philosophical outreach …yielding a fresh and accurate understanding of various investigation fields of Nature, …"*
- *groundbreaking development perspectives for Sciences (emphatically plural!)".*
  - *more than groundbreaking and paradigm-shattering.*

Dr. David Stewart, PhD, DNM. *"The Close-Neppe seminal work in creating TDVP constitutes one of the most profound and far-reaching discoveries and developments in the history of the sciences."*

- *"The authors' many years of labor will be appreciated for centuries to come."*
- *"When two polymaths make discoveries that are so groundbreaking they change the whole fabric of reality, it is clear that this is Nobel Prize material."*
- *"…laid a foundation for all future science to develop. The world of scientific understanding, in all fields, has been permanently changed"* [c]

18 different specialty prominent scientists have similarly commented (footnote). [d, ttt] Consequently we're encouraged!

The Nine Close-Neppe / Neppe-Close/ Discoveries That Have Greatly Changed The Current Conception Of Reality: Section 23 [uuu] [vvv]

Vernon M. Neppe MD, PhD, FRSSAf and Edward R. Close PhD

Our TDVP model is scientific, and yet that could also be regarded as strongly linked with consciousness. However, frequently, these are derived purely from a scientific and mathematical perspective, with the discoverers not regarding this as linked with spirituality or the infinite.
We emphasize here the first component of our findings that we regard as our epiphanies and collaborative awarenesses. But we have chosen those of our findings that colleagues regard as having the potential to change thinking. These examples are illustrative and there are likely many others, not yet explored by Neppe and Close, that could have been used instead, for example, we might use TRUE [www] analysis to investigate

- [c, d, e] Dr. Alan Hugenot DSc, Physicist and Engineer*: "When taken altogether, the entire work is worthy of several separate Nobel Prizes"*
- A fourth quotation series is collective, from SCERS as an interdisciplinary group of *10* experts (2016-2018) including Dr. Joyce Hawkes PhD, FAAAS, biophysicist: *"…any one of these [31] areas, let alone the combination would be a very substantial reason for Drs. Neppe and Close to be recipients of major prizes".*
- There are several brief comments by seven others in seven different disciplines. This includes possibly the world's three leading experts in their disciplines, namely Drs. Stan Krippner, Dean Radin and Larry Dossey.
- Stan Krippner PhD, Humanistic Psychology: "*destined to become a classic in the literature on shifting paradigms and worldviews"*,
- Dean Radin, PhD, Parapsychologist: *"RBC [is] in a radical multidisciplinary class by itself"*;
- Larry Dossey MD, Healing author: "…reconciliation between science and spirituality …following TDVP";

Additionally five other prominent scientists have significantly endorsed TDVP.

- Alan Bachers PhD: Psychologist: "*an astonishing and prodigious accomplishment!"*;
- John Poynton PhD:, Biologist: "*encyclopedic … broad exploratory paradigm for new scientific ideas";*
- Lance Storm PhD, Editor: "*a paradigm shift that … a scientific overhaul and shift in thinking"*;
- Helmut Wautischer PhD, Philosopher: *"will shape philosophical discourse … a profound value to the future of humankind…masterful…"*;
- Frank Luger MD, Grandmaster: "*astonishing that you …combine deep scientific notions with mysticism."*

[uuu] The data here is based on hundreds of publications and the Neppe-Close book *Reality Begins with Consciousness: A Paradigm Shift that Works* (www. brainvoyage.com). It is often very complex and therefore we're stating the basics in the text, and clarify with footnotes and references.
[vvv] Each of these Neppe-Close/ Close-Neppe discoveries radically interface Science with Spirituality, besides the comments about apparent. inspiration and collaborations with broader extended higher consciousness.
[www] TRUE stands for Triadic Rotational Units of Equivalence, a new Close-Neppe technique for analyzing gimmel and chemicals including the elements.

why there is so-called junk DNA. Could this reflect 'consciousness' and/ or 'higher dimensions'? (translated as 'spirituality'). [341; 342]

We first summarize some key findings in TDVP [xxx] (Triadic Dimensional Vortical Paradigm) pertinent to spirituality. We list these recognizing the great respect we have for other researchers, and with a profound awareness of our own limitations.

1. ***Materialism is mathematically refuted at the atomic level:*** The common teaching of the atom consisting *only* of protons, neutrons, and electrons is *physically and mathematically impossible*. This refutes the fundamental idea of *atomic materialism*. [28; 275 4 126] *We cannot have half an atom or half a particle (e.g. electron):* [yyy 2; 4; 22; 25; 26; 27; 28; 40; 101; 102; 103; 104; 105; 110; 255; 343] The same math demonstrates the need for a third agent ('gimmel') [zzz] to explain the stability of sub-atomic structures: protons, neutrons (with quarks) and electrons need something else for stability.[aaaa 28; 275]. Gimmel is likely needed in the rotating moving vortices that constitute 9 dimensional finite reality: It is not as easily conceptualized in a 3S-1t physical existence alone. Gimmel also exists as an essential component of the infinite continuity, we postulate. It creates the bridge between the finite and the infinite though not a formal bridge, because they are, we propose, inseparable. Gimmel is a mathematical and empirical necessity in nature, and far more than just a theoretical concept.
2. ***We exist in a 9-dimensional rotating, finite, quantized, volumetric reality.*** [bbbb cccc 151; 173; 344; 345 346 46; 141; 142; 143 144; 152; 298; 299 140; 347; 348] *There are 9 finite, spinning, quantized dimensions (9D) embedded in a continuous infinite.* We must exist specifically in a 9-dimensional finite rotating cosmos[dddd]. *The 9-dimensional finite spinning model of reality has been empirically replicated on several occasions. This greatly enhances our perspective of the nature of reality.*
3. ***Gimmel is a third agent besides mass and energy:*** *The atom has not only mass and energy as 'contents'. For stability, a third form of content is necessary —a mass-less and energy-less content (called 'gimmel') that is in necessary union with mass and energy in specific quantities in all subatomic particles* (this is mathematically and *empirically* proven). *Without gimmel, our cosmos simply could not exist as it would be unstable and atoms would fly apart.* Similarly, the extent of Consciousness is tethered

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[xxx] TDVP = Triadic Dimensional (Distinction) Vortical Paradigm, the Neppe-Close metaparadigmatic 'theory of everything' originally proposed in 2011, and fundamentally unchanged, but greatly amplified in scope and extensions of the model since then.

[yyy] That third substance we have called 'gimmel'. Moreover, such quanta are not just points, but volumetric. These calculations *prove that materialism at the atomic level is refuted.* Specifically, the atom is volumetric and integral and so are the subatomic particles (electrons, protons, neutrons and quarks) and as we know them, they are mathematically unstable applying all three different procedures available: 1 Volumetric analyses of the atom.1. Mass and energy of the atom. 3. Mass-energy equivalence analyzing TRUE unit equivalents" (TRUE unit).

[zzz] Gimmel is our 2015 necessary, required concept for a massless, energyless third aspect in nature that allows for volume and completion of chemicals. We apply various terms for gimmel such as a third *substance, vehicle, agent, process and component.*

[aaaa] We proved mathematically that without gimmel, the atom could not be stable. Gimmel' must be added to *each* of the elementary particles (Protons:1 down and 2 up- quarks; Neutrons: 1 up- and 1 down-quark; and Electrons).

[bbbb] In all of these new discoveries, we list the year that we first described our finding: This may or may not correlate with the first publication in the area. The first-mentioned scientist (Neppe or Close) refers to the initial discoverer although in all instances our work has been collaborative. In this instance, it's Close and Neppe, mid to late 2013.

[cccc] Dimensions, like all terms in this discussion, have been carefully and specifically operationalized: Technically, dimensions are non-congruent, non-parallel extensions: They are *measurable* in terms of units of *extent* (CoD) such as Space, Time and (dimensional) Consciousness. Operationally, in the Euclidean framework, for convenience, dimensions are defined as orthogonal to each other and characterized in degrees of freedom. Dimensions interact together forming different 'dimensional domains' with specific properties.

[dddd] 'Rotation' describes the 8 rotations between dimensions 1 to 9. In quantum physics, terms like 'half-spin' imply 180-degree rotations are used: So 8 rotations. 'Spin' is an alternative to 'rotation' so if half-spin = 4 full '360-degree' rotations. In 3S-1t, it's illogical: 1.5 rotations. More correctly, the Neppe-Close view recognizes that there are always three rotations e.g. in quarks all orthogonal (90 degree in many dimensions) and parangular (dynamic orthogonality across dimensions) to each other. This means that even so-called 2/3 spin times 3 will produce an integral number of rotations from Dimensions 1 to 9.

to Space and Time. [165] [eeee] *Gimmel* has versatile applications, and involves important concepts of 'gimmel' TRUE units. [2; 4; 22; 25; 26; 27; 28; 40; 101; 102; 103; 104; 105; 110; 255; 343] [ffff] It is empirically proven.

4. ***The infinite continuity plays a critical role in our existence, and in life, and order.*** The infinite is needed, because without it TDVP could not be a TOE. It could not be a TOE, because applying *Gödel's incompleteness theorems* [gggg] *[68; 69; 349] the finite alone would be insufficient: there would need to be something beyond the 'finite box'; that something is the infinite continuity.* [68; 69] [hhhh] Without the finite being embedded in the infinite, the solution would be 'incomplete' as the finite would be still be contained in that same finite. To be 'complete', something must metaphorically be 'looking inward from outside the finite box'. Thus, to be a TOE, the quantized finite requires something not quantized outside, yet completely containing that finite that's inside the box. The infinite, which has different qualities—'continuous', not quantized, enveloping all the finite—fits.
5. ***The laws of nature are unified:*** Effectively, the same rules of nature apply for everything. Scientists can apply the same findings for quantum physics, cosmological reality and our macroworld. *The common feature is Gimmel and TRUE unit analyses, and the 9-dimensional quantized vortical* [iiii] *finite reality embedded in the infinite continuity*. Our data demonstrate that these concepts are not just abstract mathematical operators, but that they describe empirically relevant *real* phenomena. [jjjj] *The laws of nature that exist are the same universal rules at all levels including quantum, macro- and cosmological domains. There's no 'quantum weirdness' or 'dark' cosmic paradoxes* [kkkk]*: Our findings reveal a 9-D finite reality embedded in infinity, and the same rules extend to the spiritual realm as well.* [350 2; 101; 203; 227; 228; 351]
6. ***Scientific boundaries require extending beyond the proof of falsifiability: alone: Feasibility and LFAF allows science to be better applied.*** Scientific feasibility is a legitimate and critically important method that applies beyond the usual but very limiting concept of falsifiability. [llll] LFAF extends the whole basis of science, extending science to evolution including cosmology, meaningful evolution (with spiritual implications), consciousness research including psi and survival, most of the relevant facets of medicine, pharmacology and biology that are better interpreted in practice as 'feasible' even when they can be falsified [mmmm], extra dimensions that change our fabric of reality, and infinity that has enormous spiritual

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[eeee] the atomic structure with just protons, neutrons and electrons (or quarks and electrons) alone is mathematically impossible (Neppe and Close, 2014).

[ffff] TRUE = Triadic rotational units of equivalence. our necessary, empirically proven mass-energy-gimmel concept.

[gggg] Kurt Gödel (1931) showed that any finite system cannot demonstrate its own consistency: We need to go outside that system to fully recognize the full mathematical implications.

[hhhh] Our data shows the atom cannot be stable unless there is an additional third substance (gimmel). Atoms, mathematically, have to be very precise: They can only be whole (integral) with the correct combinations of very specifically derived gimmel scores being added. We created a unit score for the electrons, and recognized all other structures must be quantized integers and they should be calculated by volume ('Volumetric Equivalence' or VE) applying the new Close-Neppe "*Triadic Rotational Units of Equivalence"* (TRUE) units. *Unless we incorporate gimmel in the correct quantities into the atom, mathematically atoms would just fly away*—atoms need to be stable to exist permanently: They would be unstable without a union with gimmel. Basically, this means that we cannot have, for example, half an atom or a half electron. (Neppe and Close, 2015)

[iiii] Vortical: Vortices are ubiquitous in nature. A vortex rotates and moves across volumes (3 dimensions).

[jjjj] Our data shows that the TRUE scores for quarks, electrons, neutrons and protons, are exactly the same as those in the Large Hadron Collider and the standard calculations show atomic mass units of e.g. Hydrogen to be the same as the TRUE derivations.

[kkkk] Dark matter and dark energy proportions to the cosmos correlate within 1 in 1250 with gimmel to TRUE. Ratio of dark matter with nucleons (protons and neutrons) to dark energy with electrons closely correlates. As 95.1% 'dark' substances cannot fit into our 4.9% physical universe (3S-1t), we postulate it fits into the 9-dimensional model. Gimmel and 9-dimensional quantized spinning finite reality eliminates most of the unsolved and illogical findings of quantum 'weirdness'.

[llll] Karl Popper impacted Scientific Method by requiring just falsifiability and ignoring feasibility.

[mmmm] The limitations of feasibility are ignored in Medicine.: We want to get better. An antibiotic that works at 51% level may statistically be proven by 'falsification' (in double-blind studies) to be better than placebo at 48%. But we want scientifically feasible treatments (e.g. that antibiotic, given the correct bacteria, should help us almost always (e.g. in 95% of cases).

implications. [3691]4; 44; 82; 332 14; 352; 353; 354. ***nnnn***

7. ***Vortical movements (Rotation, 'spin') are through 9 dimensions:***
All of the Elements of the Periodic Table are made up of stable vortical distinctions that are known as fermions, "particles" with an intrinsic angular spin of 1/2, or they are made up of combinations of fermions. We can analyze the fermions that make up the Hydrogen 1 and Hydrogen 2 atoms and Helium atoms and all other elements. We can examine their parameters of spin, charge and mass based on experimental data. The top- and bottom-quarks and the charm- and strange-quarks are ephemeral unstable particles, so are not part of the calculations, and nor are neutrinos or any "anti-particles". [2; 101] (Close and Neppe, 2017). We've further recently mathematically and empirically demonstrated this result is correct for electrons, protons, and neutrons (where the derivation is more complex) and for the Hydrogen atom itself. [60; 154; 181; 193; 309; 335; 336; 337; 338; 339; 340 29]
8. ***All of empirical reality is based on quantized volumetric measures.*** Applying the 'Close Conveyance Equation', this means that there are only *rare* natural suitable Diophantine solutions of $a^3 + b^3 + c^3 = d^3$ in elements and compounds. In every instance, c refers to the quantity of gimmel that needs to be in union with nucleons and electrons.
9. ***Stability of atoms:*** Our universe requires every particle with mass and/or energy in the universe to be in union with a fixed amount of stabilizing third component (of gimmel TRUE units). [oooo] Without gimmel, rapidly spinning particles would be unstable and ephemeral; they would simply fly apart. [355; 356; 357 pppp]

The Groundbreaking Proven TDVP Triadic Dimensional Vortical Paradigm Discoveries through LFAF feasibility: Section 24.

Vernon M. Neppe MD, PhD, FRSSAf and Edward R. Close PhD

We describe here nine discoveries. They are all groundbreaking and illustrated by TDVP's principles [53; 54; 75; 106]. However, despite being *empirically feasible and not falsified*, the level of 'proof' is based on the feasibility of the jigsaw puzzle pieces of data fitting. This allows us to extend science by applying the LFAF illustrative scientific proofs, despite some not being able to be Popperian 'falsified' [83; 84; 358; 359]. So 'proven' is applied in a different sense here—the LFAF way. [14; 44; 82; 332 14; 352; 353; 354]. These findings are listed by year as they preceded much of the math.

1. ***The finite involves quantized volumes:***
Everything—Space, Time, and Consciousness (STC) empirically contains volume—it is 'volumetric' (3-dimensional so 3-D) not a point (0-dimensions), linear (1-D) or planar (2-D).

2. ***The infinite is without a beginning or end in all of STC***:
The infinite extends forever. Because of time happening eternally in continuity, all time that we experience

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[nnnn] LFAF: The commonly used description for Neppe-Close Lower Dimensional Feasibility, Absent Falsification (Neppe and Close, 2011), a Philosophy of Science technique to extend the current idea that science needs to be falsified. Scientists are raised to be hypocritical and inconsistent: Cosmology, evolution and quantum mechanics with its 'weirdness' are regarded by the establishment as sciences even though they're based on feasibility and often not falsifiable; yet prejudice reins: parapsychology, which applies the most detailed research in all of the sciences is labeled a 'pseudoscience;' and consciousness research and dimensionality that apply feasibility and falsifiability, are generally regarded as 'pseudosciences'. Somewhere in between are the Forensic Sciences, Social Sciences and Medicine because they are often not falsifiable, but feasibility is the key to their scientific interpretations.

[oooo] Demonstrated with quarks, protons, neutrons, electrons, atoms, photons.

[pppp] Ephemeral particles may not be in union with the required gimmel.

in finite 'quantized' bits (like little pixels one at a time) can occur simultaneously. The infinite space, too, is never-ending, extending without end. And the infinite is a repository of conscious *information* containing everything in all time and all space. [62; 63; 360] (Neppe and Close, 2011)

3. ***The continuous infinite is ordered (it's 'ordropic'):***

Whereas our finite existence is *entropic*—it tends toward disorder [54; 75; 306], the continuous infinite, that contains the finite, tends of complete *order*. We call this property 'ordropic' (from 'order' and 'tropy'). The presence of gimmel in the infinite demands ordropy because it is a different substance, possibly an agent of consciousness that based on calculations cannot be destroyed, it maintains a balance between mass, energy and 'gimmel'. Because gimmel is demonstrated in the quantized finite and the infinite envelops the finite, ordropy occurs in the finite, as well. Effectively, it is the opposite of the 'entropy' that we experience in the finite, which is based on Newton's second law of thermodynamics.[qqqq] In contrast, ordropy is linked with *existence*.

4. ***Life continues forever.***

Everything biological is immortal. [26; 306; 361; 362]There is an existence before our physical life and a life after physical death. That existence includes our physical *life* which reflects just one phase of ongoing infinite *existence* that goes on *at all times*: This means *everything including ourselves is necessarily immortal*: Though there's physical death, that does not mean an end to real existence which in the infinite goes on forever. But what happens in the finite? After physical death, instead of our experiencing the physical 3S-1t, a different dimensional STC footprint might exist such as portions of domains 5 to 9. The continuous infinite envelops all of the finite space, time and consciousness extent, and a mass-energy-consciousness content. (Neppe and Close, 2011) [rrrr]

5. ***Gimmel might originate in the infinite.*** If so, this might reflect pure consciousness at that level, yet hierarchically that still would contain mass and energy entirely embedded in the gimmel infinite consciousness. (Neppe and Close, 2014) Gimmel is also in union with photons in the infinite continuity: We've hypothesized photons are in union with infinite gimmel GTUs. However, in the discrete (quantized) finite, the photonic state is different: photons must be in union with the *same amount* of GTUs as electrons, because of electron involvement in the photo-electric effect [217] (Close and Neppe, 2016).

6. ***TDVP constitutes a Theory Of Everything that works:***

Searching for a Theory of Everything (TOE) has been a task that many have attempted. However, only TDVP reaches the heights of being a legitimate TOE. This is demonstrated when carefully performed metric comparisons of the 24 major different proposed TOEs are applied. [5] The Neppe-Close TOE of TDVP scores a perfect 39/39 and no others besides the original Neppe Vortex N-dimensionalism at 27/39 [363; 364; 365; 366] and Close Transcendental Physics at 23/39 even score 20/39 or above. [202] Even the conventional Standard Model

[qqqq] Newton did not describe entropy itself, though. That is attributed to Sadi Carnot in 1824 when he described an upper limit in a heat engine to the efficiency of conversion of heat to work.

[rrrr] We dislike the term 'Theory of Everything' because of its ambiguous interpretations, but currently this is the term that is used for a complete explanatory model of reality conforming to the laws of nature. TOEs should seamlessly reconcile with all the major theoretical models and authoritative sources of *all* the sciences and mathematics. However, they should *not be construed as reflecting omniscience*, instead implying application of principles. TOEs are sometimes regarded as primarily philosophical, yet the original, limited meaning was in Physics. We believe that the TOE term as used in popular literature is a misnomer. Not only does a real TOE have to explain physical reality, it also has to explain consciousness, dimensions and infinity. A TOE needs to be able to explain mathematically, empirically and feasibly without contradiction.

of Physics (SMP) scores only 13/39. This shows the SMP might be insufficient, though very useful in our physical reality. A recent analysis did not extend to the now 26 other models (including Jainism —not yet rated). However, because the other attempts at TOE models score below 50% (at most at 19/39), the only relevant TOE to analyze was the Triadic Dimensional Vortical Paradigm: TDVP still scored perfectly at 62/62.

7. ***Consciousness has to be included in the equations of physics.*** [202] This allows us to even begin to approximate a real TOE. TDVP includes all of this. Not only does it recognize consciousness as a key, and differentiates different kinds of consciousness paradigms [29; 53; 106; 167; 367; 368; 369; 370]. But TDVP also included infinity in it, because a TOE cannot be solved purely with the finite reality when applying the finite reality [68; 69] as it would be incomplete. [45; 65; 371; 372; 373; 374] Neppe and Close developed the term 'metaparadigm' instead. This involves the broadest paradigm impacting all sciences, mathematics and philosophy without contradiction. To achieve the level of a TOE or metaparadigm, the model, like TDVP does, must be groundbreaking with new discoveries and applications.
8. ***Mathematics closely reflects the nature of reality:***

Mathematics is real: It closely reflects the nature of reality. Math is more than just for calculations or operators. Mathematics is empirically meaningful. Mathematics appears to be part of nature, not just a method of calculations and operations. This hypothesis has support. Math is not just for calculating, but has a vibrant basis for reality. Our *analyses should be based on 3-dimensional cubic structures, not linearly.* Our findings have not yet been contradicted and are feasible. We can use this as tool for further hypotheses. It's our strong impression that mathematics involves empirical knowledge; it is not just a means of calculation. [2; 4; 23; 25; 103; 110; 155; 255; 330; 331] (Close and Neppe, 2011).

9. ***TDVP can be translated from theory to empiricism***

The atomic mass-energy-volumetric equivalents (MEV) in TRUE unit measures of protons, and electrons, directly correlate with the Large Hadron Collider! [2] This means that TRUE units are real empirically not just a theoretical construct. We can demonstrate that the electrons, protons and neutrons correlate exactly after normalization with the LHC data. The neutron, particularly, is an unstable particle (beta decay is about 10-15 minutes) [199; 375], and converts mainly to protons [199; 375], hence the same LHC calculations of these figures, after normalizations, are 1836 for the proton and when corrected 1839 for the neutron applying TRUE units! [ssss]

Wondrous Gimmel: Section 25.

Vernon M. Neppe MD, PhD, FRSSAf and Edward R. Close PhD

By applying the empirical findings of chemistry and physics and mathematical equations, including new derivations, we extend quantum-to-molecular level analyses in a 9-dimensional spin model. Our current physics involving 3 dimensions of space in a moment in time (3S-1t) and can explain a great deal, there are some contradictions and unsolved problems that can only be resolved by applying a 9-dimensional spin model.

We have demonstrated the empirical necessity for a third mass-less, energy-less agent, substance, vehicle or

[ssss] The neutron calculation is particularly complex because of its short half-life in the free form, yet it appears stable when combined with protons in the elements.

process besides mass and energy, called "gimmel": No subatomic particle can stably exist without gimmel, yet gimmel is not measurable using the usual physical techniques of solely applying mass and energy. Mathematically and geometrically, atoms composed of quanta, and compounds composed of atoms, cannot be stable without gimmel.

This distinction of a third content (gimmel) in stable particles, exists at every level from the subatomic, such as in elementary particles like electrons and quarks, through to the cosmological such as dark matter and dark energy. It is key to maintaining stability and symmetry of subatomic particles, of atoms of the elements, of molecules and compound chemicals. Without gimmel, these substances could not maintain stability in our physical existence and would be ephemeral and transitory.

In effect, we have empirically and unequivocally demonstrated that a third massless-energyless substance, called gimmel, necessarily exists [2; 4; 22; 60; 101; 102; 103]. We've realized gimmel is almost certainly either consciousness itself, or the vehicle that is necessary for expressing consciousness.

Gimmel, then, is not necessarily consciousness. It could be the template—the process that can allow for consciousness. In what we're calling vortical physics, the electrons and the up and down quarks are dynamically rotating in union with gimmel, but that does not mean that they are conscious. [176; 182] We speculate that consciousness might require movement impacts of the passively rotating quarks and electrons: This is passive in the sense of no activity or impact or influences; it becomes active when enveloping consciousness via the gimmel vehicle.

Gimmel is *not a subatomic particle.* But gimmel involves processes in union with mass and energy. Gimmel is not only in the physical 3S-1t, but it moves through the different dimensions of STC and, we postulate rather cogently, it is also contained in the continuous infinite. We argue that it might originate in the infinite and in that way might originate before the Origin Event: most regard that event as the Big Bang; because it is infinite and the infinite involves all of time, it does not have a beginning.

Where does *gimmel* come in? [2; 4; 25; 26; 101; 103; 104; 105; 110] At one point, we thought gimmel was the same as consciousness, but we could not define it as such, because people could argue that it could be something else: Could it be like gluons, just acting as a glue to complete the volume of protons and neutrons [4; 112; 376]? That is unlikely, because we've effectively shown gluons are mathematically incorrect. [4] Could it be just an operator to fill missing volume? No, it's not, because we know that there is an exact correlation of neutrons and protons and electrons and quarks with the figures from the Large Hadron Collider [209]and that the atom (e.g. Hydrogen) exactly correlates in our TRUE analyses with Atomic Mass units. [285; 295].

However, there is an alternative: We just know that gimmel is an extra third substance which might contain volume, but does not contain mass and energy. It is the remarkable third substance that is necessarily linked with stable subatomic particles that are rotating vortically in three-directions that are symmetrical on their axis. [2; 4; 60] There must be an axial symmetry and this is attained by gimmel. Otherwise, this would not work out from the point of view of any 3-dimensional or volumetric analyses. Otherwise, particles would simply fly away. [2; 4; 60] This symmetry is so even if the volume is not a perfect sphere (which it never is in our empirical reality). [377] We know this mathematically because Fermat's Last Theorem would show that we could not get a cube that way. [266; 267; 378] So there has to be something else, and this is what we call 'gimmel'.

So we used to say, "*What else can gimmel be but consciousness?"* We now think that *gimmel is a necessary but not sufficient component for consciousness. Gimmel is the vehicle by which consciousness comes in:* It is

the necessary vehicle; but one still has to have that 'spark'—maybe that 'Godly spark'—that impacts and that influences, at every one of these EPIC levels.

So, in the finite and transfinite, we cannot have consciousness without gimmel, because at that fundamental level we need a third substance to produce stability and symmetry.

Today, we would argue about "gimmel" being a logical role instead of consciousness because we can more easily measure gimmel. And we can find that it has that correlative role in Dark Matter and Dark Energy. This raises the whole question of what consciousness or gimmel is. Could it be 95% of our cosmos is gimmel or is 95% just in conjunction with the Dark substances. [2; 4; 25; 57; 99; 103]

But we might be able to have consciousness without gimmel in that external, infinite component—and, indeed, we have hypothesized that gimmel originates from the infinite [2; 4; 25; 28; 105]. For example, we have argued that the photon at the infinite level likely has an infinite amount of gimmel. [377] By the time it reaches our 3S-1t level as light, it exhibits the same amount of gimmel as the electron—as in Einstein's photoelectric effect [217]. Importantly, again, all of this is volumetric: It is volumetric and it is spinning, and therefore it is vortical, involving fundamental shape rotations. [60; 154; 181; 193; 309; 335; 336; 337; 338; 339; 340] And this is why calculations in our real world involve stability.

As indicated, the question arises whether the gimmel in union with elementary subatomic particles like quarks and electrons and with photons exhibit some rudimentary consciousness. We used to argue that they did, because this would mean a progression all the way through our particle universe at the quantum level going upwards. However, we know that results are not stochastic: In other words, there are times when these particles are not random suggesting something is going on.

Photons are energy, but effectively massless, subatomic particles. We postulate there is an infinite amount of gimmel in union with photons in the infinite reality, and the same amount as for electrons – namely 105 gimmel TRUE units (or GTUs) – in the finite 3S-1t.There is some supportive data when we calculate the Gimmel scores of quarks which, for the same kind of up or down quark in proton and neutrons, range from 1 to 6: Why are they different? [2; 25; 26; 104 25; 330] We don't know. We know only that certainly something works through the human to impact on quantum data. We know this based on RNG data. And, in that instance, gimmel works through the human to impact on quantum data.

We call that component of so-called gimmel that is contained instead of the neutron in hydrogen 'daled'. Is daled a separate property or property to gimmel? Or is it just some other way to conceptualize gimmel? We don't know. But it is legitimate to regard it as separate, though not necessarily appropriate.

Gimmel is also in union with photons in the infinite continuity: We've hypothesized the photons then have an infinite amount of Gimmel TRUE units (GTUs). However, in the discrete (quantized) finite, the photonic state is different: photons must be in union with the *same amount* of GTUs as electrons, because of electron involvement in the photo-electric effect [217]**.**

Gimmel's properties appear to range all the way from the subatomic to the cosmological, impacting dark matter and dark energy, too. [28; 105]In tethering, components—such as substrates space and time—are inseparably attached to each other at one or more roots. Union implies more gimmel, where we describe mass and energy. This is the Mass-Energy-Gimmel Triad.

Just as Minkowski spoke about "no longer will space and time be separate, they will forever be a union" [226], gimmel too is always a union: a 'hovering over' of mass and energy with gimmel.

When assessing the value of a concept, we like to find one that has appropriate application. Gimmel appears to come out unchanged in terms of reactions. Sometimes this might even involve so-called beta decay in the relationship between, for example, the neutron and the proton. A chemical that comes out unchanged in reactions, but impacts that reaction, for example, by speeding it up considerably, is called a 'catalyst'. And we have postulated that gimmel is a catalyst. The parallel might be extended here, where the catalysts are reflecting the good parts of the decay reactivity. [60; 154; 181; 193; 309; 335; 336; 337; 338; 339; 340]So what do we know about gimmel?

We know that gimmel:

- is the fabric of reality;
- is correlative with Consciousness, but it may just be the vehicle;
- is an extraordinarily important concept that has allowed a major advancement in TDVP;
- has been the last bastion to conquer in TDVP because the 'Extent' in dimensions now incorporates the content in gimmel.[tttt 4]
- Therefore, the number of 'gimmel TRUE units' (GTUs) in atoms made up of protons, neutrons and electrons can be calculated and varies with each element and compound (one made up of two or more elements united in specific proportions);
- is very versatile: We have now authored many articles on gimmel ranging from the Periodic Table, to gluons, to Dark Matter and Dark energy in the cosmos, to the contents of atoms [25; 28; 40; 103; 104; 105; 110; 255; 343]. (Close and Neppe, 2016).
- Different Gimmel TRUE Units (GTUs) scores exist in each of the 6 up-quarks and down-quarks have. This is not just illustrating a principle here. [4] It might imply that even though we 'label' all up-quarks and all down-quarks as the same, they are subtly different. This could then likely apply to every quantal particle.
- could be argued to be a necessary part of the content of stable structures that are symmetrical at their axes—in other words, they are stable over time as opposed to subatomic particles that are ephemeral. Some of these particles are sustained over time, but for a short time, such as the neutron, which has a half-life of 10-15 minutes (depending on the study) [198; 199; 272; 278], but uses gimmel;
- even when an ephemeral subatomic particle is attached to a stable particle, gimmel becomes part of that union, e.g. the neutron becomes part of the union with the proton, or the neutrino or the positron: at that moment in time [57], they are not necessarily unstable;
- a potentially massless, energyless (maybe) particle such as the gluon and the Higgs boson or gimmel itself is likely not in union with gimmel:
- might not be linked with all particles: there is a need for mass, energy and likely stability as the ephemeral particles are unstable;
- we think, may be a necessary vehicle, but not sufficient component,
- exhibits its union property, like an arm to a body, in all stable subatomic particles;
- is not only a container (content) but shows extent;
- might be the *consciousness impact potential*. Thus, gimmel has 3 different qualities—*content, extent, and impact*;
- might only exhibit the impact where the consciousness is there;
- contributes to stability, but it cannot be directly observed or measured.

The beginning of finite time: Was gimmel always present? An esoteric speculation.

[tttt] The amount of gimmel units is fixed with each subatomic particle. For example, remarkably, the tiny electron is in union with 105 gimmel TRUE units (GTUs). There are also different GTUs for each of the 2 down-quarks and the one up-quark in neutrons; and again, different GTUs for the protons, which are made up of 2 up-quarks and 1 down-quark. Consequently, each of these six has a different numerical equivalence of gimmel.

We postulate gimmel was maybe the first of all the components of finite reality that were present. Gimmel preceded mass and energy and therefore preceded the finite existence of the Big Bang or other 'Event Horizon'. [54]

Biblically, in Genesis 1:2, there is the phrase *tohu u'vohu.* This sometimes is translated as a 'formless and nothingness'. These two terms do not exist elsewhere in the Bible, or in regular Hebrew, and appear to have been mistranslated into the English. Based on detailed study, including commentaries, we strongly argue that '*vohu*' is actually gimmel. This *vohu* is linked up with the *tohu,* which is why they might appear together. We propose that '*vohu'* is the precursor of the mass and energy: at that point in time, before the Big Bang equivalent, *tohu* was just that formless component that needed gimmel (as *'vohu'*) to become mass and energy, as we know it: We have proposed that TDVP [54], with conservation of gimmel and TRUE as a recent axiom, and with ordropy [54] and the infinite [54], implies that the existence of the cosmos was never a 'nothingness'. It was never 'something (such as the Big Bang and our universe) 'out of nothing'. It was always something infinite before. We know that 'gimmel' fills this requirement as a foundation of our studies. We further base our opinion on the whole context of Genesis Chapter 1: 1-4. This is an illustration of how spirituality can directly support science.

So possibly gimmel was always present. It manifested and displays itself in the infinite continuity and also in the finite. The finite began with the Big Bang or equivalent Event Horizon, and therefore already had 'gimmel' (which is the Biblical term *'vohu'*).

And our intuitive title for our book, *Reality Begins with Consciousness* [54], appears to be correct. That beginning is in the *finite l*evel of existence; the infinite continuity is without beginning and without end.

References: Section 26

1. Neppe VM, Close ER. The Neppe-Close triadic dimensional vortical paradigm: An invited summary. *International Journal of Physics Research and Applications* 2020;3: (1); 001-014. https://doi.org/10.29328/journal.ijpra.1001018
2. Close ER, Neppe VM. Putting consciousness into the equations of science: the third form of reality (gimmel) and the "TRUE" units (Triadic Rotational Units of Equivalence) of quantum measurement *IQNexus Journal* 2015;7: (4); 7-119.
3. Neppe VM. Understanding Gimmel with Vernon Neppe. (YouTube). New Thinking Allowed, https://www.youtube.com/watch?v=RhV96ShslU4. 2018.
4. Close ER, Neppe VM. Speculations on the "God matrix": The third form of reality (gimmel) and the refutation of materialism and on gluons. *World Institute for Scientific Exploration (WISE) Journal* 2015;4: (4); 3-30.
5. Neppe VM. Groundbreaking Paradigm Shifts. http://www.pni.org/groundbreaking/. 2021
6. Close ER, Neppe VM. Defining The Basic Units Of Quantum Mathematics For A Quantum Calculus: Section 10. In: Derivation and application of TRUE quantum calculus for the analysis of quantized reality. *IQNJ* 2021, this article;13: (1 (Part 2)); 92-97.
7. Neppe VM. Consciousness, science and spirituality: The broad conceptualization of Consciousness through the prism of extending to the new physics: Beyond EPIC applying the mnemonics PIERCED MOCKS *Journal of Psychology & Clinical Psychiatry* 2020;11: (1); 18-38. DOI: 10.15406/jpcpy.2020.11.00666
8. Neppe VM, Close ER. Does the Triadic Dimensional Vortical Paradigm (TDVP) alter the landscape from 4D science to 9D science? The controversy of conventional scientific materialism versus integrating multidimensionality, the infinite and consciousness. *IQ Nexus Journal* 2018;10: (3, v6.23); 7-46.
9. Neppe VM, Close ER. Integrating spirituality into science: applying the Neppe-Close Triadic Dimensional Vortical Paradigm (TDVP). *IQNexus Journal* 2018;10: (2); 7-108.
10. Neppe VM. Conceptualizing good and evil in psychiatry and social groups. *IQNexus Journal* 2017;9: (3); 7-37.
11. Neppe VM, Close ER. Free-will: Freedom of choice within limits. *IQNJ (IQ Nexus Journal)* 2018;10: (1 V3.22); 7-71.
12. Neppe VM, Close ER. Philosophy. First. http://www.pni.org/philosophy/. 2021
13. Neppe VM, Close ER. Unified monism: linking science with spirituality in a philosophical model. Section 9: In Integrating spirituality into science: applying the Neppe-Close Triadic Dimensional Vortical Paradigm (TDVP). *IQNexus Journal* 2018;10: (2); 48-51.
14. Neppe VM, Close ER. Interpreting science through feasibility and replicability: Extending the scientific method by applying "Lower Dimensional Feasibility, Absent Falsification" (LFAF). *World Institute for Scientific Exploration (WISE) Journal* 2015;4: (3); 3-37.
15. Neppe VM, Close ER. What is Science? A perspective on the revolutions of change. *IQNexus Journal* 2016;8: (1); 7-19.
16. Neppe VM, Close ER. Understanding reality: Towards a unified theory of existence. *IQNJ* 2021 13: (1); V4.622, 655-159. http://www.pni.org/philosophy/.
17. Close ER, Neppe VM. Further implications: quantized reality and applying Close's Calculus of Distinctions versus the Calculus of Newton(Part 19). *IQNexus Journal* 2015;7: (4); 110-111.
18. Neppe VM. The 12 WH prongs of Consciousness: PIERCED MOCKS; section 2. In Consciousness, science and spirituality: The broad conceptualization of Consciousness through the prism of extending to

the new physics: Beyond EPIC applying the mnemonics PIERCED MOCKS *Journal of Psychology & Clinical Psychiatry* 2020;11: (1); 21-31.
19. Close ER, Neppe VM. The Calculus of Distinctions: A workable mathematicologic model across dimensions and consciousness. *Dynamic International Journal of Exceptional Creative Achievement* 2012;1210: (1210); 2387 -2397.
20. Close ER, Neppe VM. Understanding the calculus of distinctions and its role in TDVP: chapter 8 *IQ Nexus Journal* 2016;8: (4 — V6.122); 107-114.
21. Close ER, Neppe VM. Space, time and consciousness. A linkage. *Dynamic International Journal of Exceptional Creative Achievement* 2012;1203: (1203); 2102 -2115.
22. Close ER, Neppe VM. Understanding TRUE units and gimmel as part of TDVP: chapter 7 *IQ Nexus Journal* 2016;8: (4 — V6.122); 97-106.
23. Close ER, Neppe VM. Why TRUE units have to be correct: the mass in the proton: re-affirming the truth of Triadic Rotational Units of Equivalence. Chapter 6 *IQ Nexus Journal* 2016;8: (4 —V6.122); 70-96.
24. Neppe VM, Close ER. Wondrous gimmel: Section 8. In Integrating spirituality into science: applying the Neppe-Close Triadic Dimensional Vortical Paradigm (TDVP). *IQNexus Journal* 2018;10: (2); 42-47
25. Neppe VM, Close ER. Key ideas: the third substance, gimmel and the God matrix. Part 1. *World Institute for Scientific Exploration (WISE) Journal* 2015;4: (4); 3-4.
26. Neppe VM, Close ER. The gimmel pairing: Consciousness and energy and life (Part 13D). *IQNexus Journal* 2015;7: (3); 122-126.
27. Neppe VM, Close ER. Relative and dynamic psi, and gimmel: The non-local variants (Part 9). *IQNexus Journal* 2015;7: (3); 74-83.
28. Neppe VM, Close ER. A data analysis preliminarily validates the new hypothesis that the atom 'contains' dark matter and dark energy: Dark matter correlates with gimmel in the atomic nucleus and dark energy with gimmel in electrons. *IQ Nexus Journal* 2016;8: (3); 80-96.
29. Neppe VM. Phenomenological consciousness research: ensuring homogeneous data collection for present and future research on possible psi phenomena by detailing subjective descriptions, using the multi-axial a to z SEATTLE classification. *Neuroquantology* 2011;9: (1); 84-105.
30. Neppe VM: Six sigma protocols, survival / superpsi and meta-analysis.Accessed Jan 9 Accessed; 2011.
31. Neppe VM, Close ER. Explaining psi phenomena by applying TDVP principles: A preliminary analysis *IQNexus Journal* 2015;7: (3); 7-129.
32. Neppe VM, Close ER. Statistical demonstrations of psi. (Part 2). *IQNexus Journal* 2015;7: (3); 18-32.
33. Neppe VM, Close ER. Theoretical bases to analyze psi (Part 3). *IQNexus Journal* 2015;7: (3); 33-42.
34. Neppe VM, Close ER. The statistical proof of psi. *Dynamic International Journal of Exceptional Creative Achievement* 2012;1207: (1207); 2277-2290.
35. Close ER, Neppe VM. The problem of determining the mass of the neutron: Section 14: In: Derivation and application of TRUE quantum calculus for the analysis of quantized reality. *IQNJ* 2021, this article;3: (Part 2. 1); 106-107.
36. Close ER, Neppe VM. Derivation and application of TRUE quantum calculus for the analysis of quantized reality, including empirically verifiable new approaches to mass, neutrons, protons, law of conservation of gimmel and TRUE, TDVP and Deuterium. 2019 In submission.
37. Stewart D: *Letter of reference for awards to Edward Close and Vernon Neppe,* in.: 2018.
38. Neppe VM, Pokharna SS, Close ER. The remarkable Besant-Leadbeater studies in Quantal Clairvoyance (quantal remote viewing) correlate profoundly with the Triadic Rotational Units of Equivalence quantal models in Triadic Dimensional Vortical Paradigm. *IQ Nexus Journal* 2019;11, V10.33: (3); 5-72.

39. Wolfram Mathematica: Isotopes (Stable) for all the elements in the Periodic Table. Urbana, IL: Mathematica's ElementData function from Wolfram Research, Inc., https://periodictable.com/Properties/A/StableIsotopes.html. 2019 accessed.
40. Close ER, Neppe VM. Hydrogen and the elements of the periodic table: applying gimmel (Part 13). *IQNexus Journal* 2015;7: (4); 66-69.
41. Shaw GB: Annajanska, the Bolshevik empress (Play). London: Coliseum Theatre, 1918.
42. Eddington A: The philosophy of physical science. Ann Arbor, MI: University of Michigan, 1938 (republished 1958).
43. Neppe VM, Close ER. The important Eddingtonian analogy: Part 1 *IQNexus Journal* 2016;8: (1); 21-22.
44. Neppe VM, Close ER. The second conundrum: Falsifiability is insufficient; we need to apply feasibility as well Lower Dimensional Feasibility, Absent Falsification (LFAF) as a scientific method *IQNexus Journal* 2015;7: (2); 21-23.
45. Neppe VM, Close ER. The first conundrum: can the standard scientific model be applied to develop a complete theory of reality? . *IQNexus Journal* 2015;7: (2); 15-20.
46. Close ER, Neppe VM. Translating fifteen mysteries of the universe by applying a nine dimensional spinning model of finite reality: A perspective, the standard model and TDVP. Part 1. *Neuroquantology* 2015;13: (2); 205-217.
47. Donoghue JF, Golowich E, Holstein BR: Dynamics of the standard model. Cambridge, UK: Cambridge University Press, 1994.
48. Oerter R: The theory of almost everything: the standard model, the unsung triumph of modern physics. New York: Person Education, 2006.
49. Pokharna S: Is the modern science finally approaching Jainism? (original in Hindi). Ahmedabad: Jinendu, 2018, March 25.
50. Pokharna SS. The modern science appears to be approaching towards Jainism: Strong evidence that direct knowledge through consciousness is possible. 2018, in press.
51. Pokharna SS, Prajna C. Jain concepts and TDVP model for the theory of Everything: Some remarkable parallels. *Transactions of International School for Jain Studies II* 2018, In press: (2).
52. Neppe VM, Close ER: Reality begins with consciousness: a paradigm shift that works (Second Edition) 1 Edition. Seattle: Brainvoyage.com, 2012.
53. Neppe VM, Close ER: Reality begins with consciousness: a paradigm shift that works (First Edition) 1 Edition. Seattle: Brainvoyage.com, 2012.
54. Neppe VM, Close ER: Reality begins with consciousness: a paradigm shift that works (5th Edition) Fifth Edition. Seattle: Brainvoyage.com, 2014.
55. Brax P. The supermoduli space of Matrix String Theory. 2011, http://cdsweb.cern.ch/record/411941/files/9912103.pdf. 2011.
56. Schwarz P. The official string theory website: Basics. http://www.superstringtheory.com/basics/index.html and http://www.superstringtheory.com/forum. 2003
57. Kiritsis E: String theory in a nutshell. Princeton: Princeton University Press, 2007.
58. Figueroa-O'Farrill JM. String theory in a nutshell. http://www.strings.ph.qmw.ac.uk/WhatIs/Nutshell.html. 2003.
59. Duff MJ: The theory formerly known as strings, *Scientific American*; February, 1998.
60. Close ER, Neppe VM. Derivation and application of TRUE quantum calculus for the analysis of quantized reality, including empirically verifiable new approaches to mass, neutrons, protons, law of conservation of gimmel and TRUE, TDVP and Deuterium. 2018 In submission.

61. Neppe VM, Close ER: Relative non-locality and the infinite, in *Reality begins with consciousness: a paradigm shift that works (5th Edition)*. Edited by. Seattle, WA: Brainvoyage.com. 2014. pp. 376-379.
62. Neppe VM, Close ER. The discrete finite contained in the continuous infinite: some speculations (Part 13C). *IQNexus Journal* 2015;7: (3); 120-122.
63. Neppe VM, Close ER. The infinite (Part 13B). *IQNexus Journal* 2015;7: (3); 117-120.
64. Neppe VM, Close ER. Special concepts in the finite and infinite anomalous process (Part 13). *IQNexus Journal* 2015;7: (3); 114-122.
65. Neppe VM, Close ER. A proposed Theory of Everything that works: How the Neppe-Close Triadic Dimensional Distinction Vortical Paradigm (TDVP) model provides a metaparadigm by applying nine-dimensional finite spin space, time and consciousness substrates and the transfinite embedded in the infinite producing a unified reality. *IQNexus Journal* 2014;16: (3); 1-54.
66. Neppe VM, Close ER. The Triadic Dimensional Distinction Vortical Paradigm (TDVP): The nine-dimensional finite spin metaparadigm embedded in the infinite *Dynamic International Journal of Exceptional Creative Achievement* 2014;1401: (1401); 4001-4041.
67. Morgart E. The theory of everything has nine dimensions: The sparkling diamond and the quanta jewel turn quantum physics and the nine-pronged world of consciousness— on its ear. *USA Today Magazine* 2014: (1 (January)); 66-68.
68. Smullyan R: Gödel's incompleteness theorems. Oxford: Oxford University Press, 1991.
69. Berto FJ: There's something about Gödel: the complete guide to the incompleteness theorem. New York: John Wiley and Sons, 2010.
70. Neppe VM. TDVP, Physics and Mathematics – Historical Aspects: Section 2. In: The intellectual giants who preceded the Triadic Dimensional Distinction Vortical Paradigm (TDVP). *IQNJ* 2020;12: (1); 7-25.
71. Neppe VM, Close ER. Revisiting Thomas Kuhn: An extended structure for Scientific Revolutions: Part 2 *IQNexus Journal* 2016;8: (1); 11-19.
72. Neppe VM, Close ER. A new approach to the philosophy of science: LFAF and 11 NCR. Part 5.
In: Does the Triadic Dimensional Vortical Paradigm (TDVP) alter the landscape from 4D science to 9D science? . *IQ Nexus Journal* 2018;10: (3, v5.15); 31-37.
73. Neppe VM. The scientists who taught principles on which TDVP can be applied: Section 1. In: The intellectual giants who preceded the Triadic Dimensional Distinction Vortical Paradigm (TDVP). *IQNJ* 2020;12: (1); 7-25.
74. Close ER, Neppe VM. Derivation and application of TRUE quantum calculus for the analysis of quantized reality, including empirically verifiable new approaches to mass, neutrons, protons, law of conservation of gimmel and TRUE, TDVP and Deuterium. 2020 In submission.
75. Neppe VM, Close ER: Reality Begins with Consciousness (RBC)—Key Features 2nd Edition. Seattle, WA: Brainvoyage.com, 2014.
76. Neppe VM, Close ER. Reality begins with consciousness revisited. *J. Parapsychology* 2013;77: (2); 143-147.
77. Feynman RP: Electrons and their interactions. QED: The strange theory of light and matter. Princeton, New Jersey: Princeton University Press., 1985.
78. Feynman RP (ed.). *The Feynman lectures on physics*. USA, Addison-Wesley, 1965.
79. Neppe VM, Close ER. The groundbreaking paradigm shift: triadic dimensional-distinction vortical paradigm ("TDVP"): a series of dialogues. *IQ Nexus Journal* 2016;8: (4 — V6.122); 7-125.
80. Neppe VM, Close ER. Redefining science: Applying Lower Dimensional Feasibility, Absent Falsification (LFAF): Section 1. In Integrating spirituality into science: applying the Neppe-Close Triadic Dimensional Vortical Paradigm (TDVP). *IQNexus Journal* 2018;10: (2); 9-13.

81. Neppe VM. Feasibility and falsification in science: On LFAF (YouTube). New Thinking Allowed, https://youtu.be/w3elui7unrA. 2018.
82. Neppe VM, Close ER. Re-evaluating our assessments of science: The approach to discovery, applying LFAF to the philosophy of science *IQNexus Journal* 2016;8: (1); 20-31.
83. Popper KT: The logic of scientific discovery. London and New York: Routledge / Taylor and Francis e-Library, 2005.
84. Popper K: Conjectures and refutations. London: Routledge and Keagan Paul, 1972.
85. Cantor G (ed.). *Contributions to the founding of the theory of transfinite numbers*. New York, Dover, 1955.
86. Einstein A. Fundamental ideas and methods of the Theory of Relativity, presented in their development *Papers* 1920 7: (31).
87. Einstein A: Relativity, the special and the general theory—a clear explanation that anyone can understand (Fifteenth Edition). New York: Crown Publishers, 1952.
88. Eddington A: The expanding universe: astronomy's 'great debate', 1900-1931. Cambridge: Press Syndicate of the University of Cambridge, 1933.
89. Koestler A: The Sleepwalkers. London: Hutchinson, 1959.
90. Planck M: Max Planck: Scientific Autobiography and Other Papers, in. Edited by. New York: Harper 1949. pp. 33–34 (quotation)
91. Planck M. Quotations of Max Planck. https://www.goodreads.com/quotes/111818-science-advances-one-funeral-at-a-time. circa 1950.
92. Planck M. On the law of distribution of energy in the normal spectrum. *Annalen der Physik* 1901;4: (3); 553. Bibcode:1901AnP...1309..1553P. doi:1910.1002/and p.19013090310.
93. Planck M: *There is no matter as such,* in Web notepad: Everything noticed and interesting. 1918.
94. Planck M: The theory of heat radiation (translator: Masius, M.P.): Blakiston's Sons & Co, 1912.
95. Sulloway F: Born to rebel. Oregon, IL: Quality Books, 1996.
96. Smith T. Marshall and Warren win Nobel for work on Helicobacter as cause of peptic ulcers. Pandas Thumb, https://pandasthumb.org/archives/2005/10/marshall-and-wa.html. 2005, October 3
97. Smythies JR: The walls of Plato's cave. Aldershot: Avebury Press, 1994.
98. Ferguson AS. Plato's smile of light. (Part II.) The allegory of the cave (Continued). *JSTOR. The Classical Quarterly* 1922;16: (1. 636164); 15–28.
99. Neppe VM. Aspects of psychical phenomena. *The Leech* 1973;43: 27-35.
100. Neppe VM, Close ER. Fifty discoveries that are changing the world: Why the Triadic Dimensional Distinction Vortical Paradigm (TDVP) makes a difference. *IQ Nexus Journal* 2017;9: (2); 7-39.
101. Close ER, Neppe VM. Introductory summary perspective on TRUE and gimmel (Part 1) in Putting consciousness into the equations of science: the third form of reality (gimmel) and the "TRUE" units (Triadic Rotational Units of Equivalence) of quantum measurement *IQNexus Journal* 2015;7: (4); 8-15.
102. Close ER, Neppe VM. Empirical exploration of the third substance, gimmel in particle physics (Part 10). *IQNexus Journal* 2015;7: (4); 45-47.
103. Close ER, Neppe VM. The TRUE unit: triadic rotational units of equivalence (TRUE) and the third form of reality: gimmel; applying the conveyance equation (Part 12). *IQNexus Journal* 2015;7: (4); 55-65.
104. Neppe VM, Close ER. Speculations about gimmel Part 5. *World Institute for Scientific Exploration (WISE) Journal* 2015;4: (4); 21-26.
105. Neppe VM, Close ER. The fourteenth conundrum: Applying the proportions of Gimmel to Triadic Rotational Units of Equivalence compared to the proportions of dark matter plus dark energy: Speculations in cosmology. *IQNexus Journal* 2015;7: (2); 72-73.

106. Neppe VM, Close ER. Applying consciousness, infinity and dimensionality creating a paradigm shift: introducing the triadic dimensional distinction vortical paradigm (TDVP). *Neuroquantology* 2011;9: (3); 375-392.
107. Neppe VM, Close ER. The Infinite: essence, life and ordropy *Dynamic International Journal of Exceptional Creative Achievement* 2012;1204: (1204); 2159-2169.
108. Neppe VM, Close ER. The necessity for infinity: Section 3. *IQ Nexus Journal* 2017;9: (1); 24-29.
109. Neppe VM, Close ER. The fifteenth conundrum: Applying the philosophical model of Unified Monism: Returning to general principles. *IQNexus Journal* 2015;7: (2); 74-78.
110. Close ER, Neppe VM. Summary and conclusion gimmel, TRUE and the structure of reality (Part 20). *IQNexus Journal* 2015;7: (4); 112-114.
111. Bottomley J, Baez J: Why are there eight gluons and not nine? Series Why are there eight gluons and not nine? http://math.ucr.edu/home/baez/physics/ParticleAndNuclear/gluons.html. 1996.
112. Söding P. On the discovery of the gluon. *European Physical Journal H* 2010;35: (1); 3–28.
113. Gell-Mann M. Symmetries of baryons and mesons. *Physical Review (Nuclear Physics)* 1962;125: (3); 1067–1084.
114. Gell-Mann M: The Quark and the Jaguar: Adventures in the Simple and the Complex. New York, NY: Henry Holt and Co., 1995.
115. Klimas L. The 'God Particle' explained in two minutes by the man who discovered it. The Blaze, http://www.theblaze.com/stories/2014/02/18/the-god-particle-explained-in-two-minutes-by-the-man-who-discovered-it/. 2014.
116. Davis R: Researchers may have discovered 'God particle'. Series Researchers may have discovered 'God particle' http://www.dailytoreador.com/news/article_41bdbe06-911c-11e2-b902-0019bb30f31a.html. 2013.
117. Lederman L, Teresi D: The God Particle: If the universe Is the answer, what Is the question? Seattle: Amazon Kindle, 1993.
118. Klein A: *Toward a new subquantum integration approach to sentient reality (unpublished),* in. pp. 1-40. Israel: 2010.
119. Stewart D: The chemistry of essential oils made simple: God's love manifest in molecules. Marble Hill, MO: Care publications, 2005.
120. Lenntech: *Silicon (Si) and water: Silicon and water: reaction mechanisms, environmental impact and health effects,* in Encyclopedia of science. (http://www.lenntech.com/periodic/water/silicon/silicon-and-water.htm). 2015.
121. Darling D: *Silicon-based life,* in Encyclopedia of science. (http://www.daviddarling.info/encyclopedia/E/elcosmic.html). 2015.
122. Close ER, Neppe VM. Applying hydrogen-1 and deuterium: The origin of mass: Section 12: In: Derivation and application of TRUE quantum calculus for the analysis of quantized reality. *IQNJ* 2021, this article;13: (Part 2. 1); 100-101.
123. Neppe VM, Close ER. Moving to the 9-D reality and gimmel: Part 2. In Does the Triadic Dimensional Vortical Paradigm (TDVP) alter the landscape from 4D science to 9D science? . *IQ Nexus Journal* 2018;10: (3, v5.15); 16-20.
124. Gould SJ: Rocks of Ages. New York: Ballantine, 1999.
125. Gould SJ. Nonoverlapping magisteria. *Natural History* 1997;106: (March); 16-22. www.stephenjaygould.org/library/gould_noma.html.
126. Neppe VM. Kabbalah, science, and spirituality with Vernon Neppe (YouTube). New Thinking Allowed, https://www.youtube.com/watch?v=AtMQdS8_Vck&t=2123s. 2018.

127. Stapp HP: Mindful universe: Quantum mechanics and the participating observer. New York Springer-Verlag, 2007.
128. De Bianchi MS. Quantum measurements are physical processes. Comment on “Consciousness and the double-slit interference pattern: Six experiments", By Dean Radin et al. [Physics Essays 25, 2 (2012)]. *http://arxiv.org/abs/1207.0804* 2012.
129. Radin D. Consciousness and the double-slit interference pattern: Six experiments. *Physics Essays* 2012;25: (2); 157– 171.
130. Neppe VM, Close ER. Relative non-locality - key features in consciousness research (seven part series). *Journal of Consciousness Exploration and Research* 2015;6: (2); 90-139.
131. Neppe VM, Close ER. The concept of relative non-locality: Theoretical implications in consciousness research. *Explore (NY): The Journal of Science and Healing* 2015;11: (2); 102-108. http://www.explorejournal.com/article/S1550-8307(14)00233-X/pdf.
132. Koestler A: The act of creation. London: Penguin, 1970
133. Neppe VM, Close ER. Perspective: dimensional biopsychophysics: approaching dimensions, infinity, meaning, and understanding spirituality and the laws of nature: Section 13. In Integrating spirituality into science: applying the Neppe-Close Triadic Dimensional Vortical Paradigm (TDVP). *IQNexus Journal* 2018;10: (2); 71-77.
134. Neppe VM, Close ER. On Non-locality III: Dimensional Biopsychophysics. *Journal of Consciousness Exploration and Research* 2015;6: (2); 103-111.
135. Truzzi M. On the extraordinary: An attempt at clarification. *Zetetic Scholar* 1978;1: (1); 11.
136. Palmer WF. Cabibbo angle and rotation projection. *Phys. Rev., D* 1973;8: (4); 1156-1159.
137. Reifler F, Morris R. Prediction of the Cabibbo angle in the vector model for electroweak interactions. *J. Math. Phys.* 1985;26: (8); 2059-2066.
138. Close FE, Lipkin HJ. Puzzles in Cabibbo-suppressed charm decays. *Physics Letters B* 2003;551: (3-4); 337-342.
139. Hughes IS: Cabibbo Mixing, in *Hughes, I.S.*, Vol. Elementary Particles (3rd ed.). Edited by Hughes IS. Cambridge University Press.: Cambridge, England. 1991. pp. 242–243.
140. Close ER, Neppe VM. The eleventh conundrum: The double Bell normal curve and its applications to electron cloud distribution *IQNexus Journal* 2015;7: (2); 51-56.
141. Neppe VM, Close ER. The sixteenth conundrum: The general immediate implications of a nine dimensional reality *IQNexus Journal* 2015;7: (2); 79-80.
142. Close ER, Neppe VM. Translating fifteen mysteries of the universe: Nine dimensional mathematical models of finite reality, Part II. *Neuroquantology* 2015;13: (3); 348-360.
143. Close ER, Neppe VM. Mathematical and theoretical physics feasibility demonstration of the finite nine dimensional vortical model in fermions. *Dynamic International Journal of Exceptional Creative Achievement* 2013;1301: (1301); 1-55.
144. Close ER, Neppe VM. The Cabibbo mixing angle and other particle physics paradoxes solved by applying the TDVP multidimensional spin model. *IQNexus Journal* 2014 14: (1); 13-50.
145. Krasznahorkay AJ, Csatlos M, Csige L, et al. New evidence supporting the existence of the hypothetic X17 particle. 23 Oct 2019, https://arxiv.org/abs/1910.10459. 2019.
146. Prior R. A 'no-brainer Nobel Prize': Hungarian scientists may have found a fifth force of nature. November 23, 2019, https://amp.cnn.com/cnn/2019/11/22/world/fifth-force-of-nature-scn-trnd/index.html?__twitter_impression=true. 2019.
147. Neppe VM, with Close ER, ,. The need to refute: Why the Triadic Dimensional Vortical Paradigm (TDVP) entails far more than the Standard Model of Physics: 4D experience is far less than our 9D+ existence. *IQNexus Journal* 2018;4: (1 V9.0i); 47-78.

148. Neppe VM, Close ER. 4D science: Blindness or logic? Part 1. In Does the Triadic Dimensional Vortical Paradigm (TDVP) alter the landscape from 4D science to 9D science? . *IQ Nexus Journal* 2018;10: (3, v5.15); 9-15.
149. Neppe VM, Close ER. The misguided, the cynics, the deniers, the scoffers and the innocent. Part 3. In: Does the Triadic Dimensional Vortical Paradigm (TDVP) alter the landscape from 4D science to 9D science? . *IQ Nexus Journal* 2018;10: (3, v5.15); 21-27.
150. Neppe VM, Close ER. Speculation versus Proof: Part 4. In: Does the Triadic Dimensional Vortical Paradigm (TDVP) alter the landscape from 4D science to 9D science? . *IQ Nexus Journal* 2018;10: (3, v5.15); 28-40.
151. Close ER, Neppe VM. Fifteen mysteries of 9 dimensions: on Triadic Rotational Units of Equivalence and new directions, Part III. *Neuroquantology* 2015;13: (4); 439-447.
152. Neppe VM, Close ER. The Cabibbo mixing angle (CMA) derivation: Is our mathematical derivation of the Cabibbo spin mixing angle (CSMA) equivalent? *IQNexus Journal* 2015;7: (4); 120-128.
153. Zimmerman Jones A. Hawking and Hertog: String Theory can explain dark energy. June 20, 2006, http://physics.about.com/b/2006/06/20/hawking-hertog-string-theory-can-explain-dark-energy.htm. 2006.
154. Close ER, Neppe VM. The problem of determining the mass of the neutron: Section 7: In: Derivation and application of TRUE quantum calculus for the analysis of quantized reality. 2018, In submission.
155. Close ER, Neppe VM. The thirteenth conundrum: introducing an important new concept, TRUE units—Triadic Rotational Units of Equivalence. *IQNexus Journal* 2015;7: (2); 60-71.
156. Anonymous. Planck mission full results confirm canonical cosmology model. Dark matter, dark energy, dark gravity, https://darkmatterdarkenergy.com/2015/03/07/planck-mission-full-results-confirm-canonical-cosmology-model/. 2015.
157. Collaborators P. Planck Publications: Planck 2015 Results European Space Agency. *Astro-ph CO* 2015;Febr.
158. Collaborators P. Planck 2013 results. XVI. Cosmological parameters. *Astro-ph.CO* 2013;arXiv:1303.5076.
159. Collaborators P. Planck 2013 results. I. Overview of products and scientific results. *Astro-ph.CO* 2013;ArXiv:1303.5062.
160. Close ER, Neppe VM. The Triadic Dimensional Vortical Paradigm (TDVP) is valid and appropriate: The roles of neutrons and protons, particle emergence including decay and vortical spin - A response. *Telicom* 2018;30: (3); 95-105.
161. Close ER. Can a quantum physics description of brain dynamics explain consciousness? *Telicom* 2009;22: (1); 36-44.
162. Close ER, Neppe VM. Dimensions, consciousness and infinity. *Dynamic International Journal of Exceptional Creative Achievement* 2012;1203: (1203); 2129 -2139.
163. Dossey L. The millennium of consciousness: reflections on the one mind. *Explore (NY)* 2013;9: (2); 67-74. http://www.ncbi.nlm.nih.gov/pubmed/23452706.
164. Nelson RD. Coherent consciousness and reduced randomness: correlations on september 11, 2001. *Journal of Scientific Exploration* 2002;16: (4); 549-570.
165. Neppe VM, Close ER: Reality Begins with Consciousness (RBC) — Glimpses and Glossary 2nd Edition. Seattle, WA: Brainvoyage.com, 2014.
166. Neppe VM, Close ER. The different faces of psychology and the perspective of "Consciousness": Part 2. *IQNexus Journal* 2014;15: (2); 17-19.
167. Neppe VM, Close ER. EPIC consciousness: A pertinent new unification of an important concept. *Journal of Psychology and Clinical Psychiatry* 2014;1: 00036: (6); 1-14.

168. Biggio C, Feruglio F, Masina I, et al. Fermion generations, masses and mixing angles from extra dimensions. *J. Nuclear Physics* .2003;B DOI:10.1016: (10.052); 1-22. http://www.researchgate.net/researcher/9966595_Carla_Biggio/.
169. Close ER, Neppe VM. Understanding TDVP through dimensions: chapter 5. *IQ Nexus Journal* 2016;8: (4—V6.122); 61-69.
170. Halpern P: The great beyond: higher dimensions, parallel universes and the extraordinary search for a theory of everything. Hoboken, NJ: John Wiley & Sons, 2005.
171. Neppe VM, Close ER. Toward a method of proof for added dimensions (Part 8). *IQNexus Journal* 2015;7: (3); 68-73.
172. Neppe VM, Close ER. Dimensions and dilemmas (Part 13A). *IQNexus Journal* 2015;7: (3); 115-117.
173. Neppe VM, Close ER. Reality, 9 dimensions, and TDVP, Section 1. *IQ Nexus Journal* 2017;9: (1); 8-16.
174. Pico RM: Consciousness in four dimensions: biological relativity and the origins of thought. New York: McGraw, 2002.
175. Close ER, Neppe VM. The role of mathematics in investigating the nature of reality (Part 4). *IQNexus Journal* 2015;7: (4); 22-26.
176. Close ER, Neppe VM. Quantum Mathematics For Quantum Reality: Introduction: Section 8. In: Derivation and application of TRUE quantum calculus for the analysis of quantized reality. *IQNJ* 2021, this article;13: (1 (Part 2)); 86-87.
177. Editors: *Platonism in the philosophy of mathematics,* in Stanford encyclopedia of philosophy http://plato.stanford.edu/entries/platonism-mathematics/. Stanford, California. http://plato.stanford.edu/entries/platonism-mathematics/.2013.
178. Gowers T: Mathematics: a brief insight. New York: Sterling, 2010.
179. Pappas T: The joy of mathematics. San Carlos: Wide World Publishing, 1993.
180. Stewart I: The mathematics of life. NY: Basic Books, 2011.
181. Close ER, Neppe VM. Application of true analysis to the elements of the periodic table: Section 9: In: Derivation and application of TRUE quantum calculus for the analysis of quantized reality. 2018, In submission.
182. Close ER, Neppe VM. Application of TRUE analysis to the elements of the periodic table: Section 9: In: Derivation and application of TRUE quantum calculus for the analysis of quantized reality. 2020, In submission.
183. Neppe VM: The Psychology of Déjà Vu: Have I been Here Before? Johannesburg: Witwatersrand University Press, 1983.
184. Neppe VM, Close ER. Integrating psychology into the TDVP model. *IQNexus Journal* 2014;15: (2); 7-38.
185. Neppe VM, Close ER. The most logical psychology: The "horizontal" approach" to Transpersonal and Humanistic Psychology in the TDVP context: Part 3. *IQNexus Journal* 2014;15: (2); 20-24.
186. Neppe VM, Close ER. The most logical psychology: The "vertical" approach" to the transcendental and Transpersonal Psychology in the TDVP context: Part 4. *IQNexus Journal* 2014;15: (2); 25-38.
187. Bokulich A, Jaeger G: Philosophy of quantum information and entanglement. Cambridge: Cambridge University Press, http://dx.doi.org/10.1017/CBO9780511676550. 2010.
188. Griffin DR. Parapsychology and philosophy: A Whiteheadian postmodern perspective. *Journal of the American Society for Psychical Research* 1993;87: (3); 217-288.
189. Neppe VM, Close ER. Resolving the scientific approach by amplifying the Philosophy of Science: Part 3 *IQNexus Journal* 2016;8: (1); 25-31.
190. Wang H: From mathematics to philosophy. London Routledge and Kegan Paul, 1974.
191. Whiteman JHM: Philosophy of space and time and the inner constitution of nature: a phenomenological study. London: George Allen and Unwin, 1967.

192. Neppe VM, Close ER. Higher consciousness outside the brain: Science and spirituality through the prism of 9-dimensional physics, gimmel and the infinite. *IQ Nexus Journal* 2019;11: (4); 5-43.
193. Close ER, Neppe VM. The proton: Section 6: In: Derivation and application of TRUE quantum calculus for the analysis of quantized reality. 2018, In submission.
194. Bohr H, Nielsen HB. Hadron production from a boiling quark soup: quark model predicting particle ratios in hadronic collisions. *Nuclear Physics* 1977;B 128: (2); 275.
195. Dossey L. Creativity: on intelligence, insight, and the cosmic soup. *Altern Ther Health Med* 2000;6: (1); 12-17, 108-117. http://www.ncbi.nlm.nih.gov/pubmed/10631815.
196. Koberlein B. Measurements of neutron decay disagree, and we don't know why. Forbes Magazine, https://www.forbes.com/sites/briankoberlein/2016/04/16/measurements-of-neutron-decay-disagree-and-we-dont-know-why/#4cfcd1b285bb. 2016.
197. Miernik K, Rykaczewski KP, Gross CJ, et al. Large beta-delayed one and two neutron emission rates in the decay of 86Ga. *Phys Rev Lett* 2013;111: (13); 132502. http://www.ncbi.nlm.nih.gov/pubmed/24116772.
198. Lorusso G, Nishimura S, Xu ZY, et al. Beta-Decay half-lives of 110 neutron-rich nuclei across the N=82 shell gap: Implications for the mechanism and universality of the astrophysical r process. *Phys Rev Lett* 2015;114: (19); 192501. http://www.ncbi.nlm.nih.gov/pubmed/26024165.
199. Bales MJ, Alarcon R, Bass CD, et al. Precision Measurement of the Radiative beta Decay of the Free Neutron. *Phys Rev Lett* 2016;116: (24); 242501. http://www.ncbi.nlm.nih.gov/pubmed/27367385.
200. Neppe VM. Science and pseudoscience. Retrieved 6 August 2018, Email to Surendra Pokharna 2018.
201. Wheeler JA. Brainyquotes of John Wheeler. https://www.brainyquote.com/quotes/niels_bohr.
202. Close ER: Transcendental Physics. Lincoln: I-Universe, 2000.
203. Close ER, Neppe VM. Unifying quantum physics and relativity (Part 8). *IQNexus Journal* 2015;7: (4); 36-40.
204. Neppe VM. Questions and comments: Unexplained conundrums and paradoxes solved through TDVP. Retrieved 18 July 2018, Email to Surendra Pokharna 2018.
205. Bauer H. Misleading notions about science and their consequences. *WISE journal* 2015;4: (2); 30-36.
206. Kuhn T: The structure of scientific revolutions 1st Edition. Chicago: Univ. of Chicago Press, 1962.
207. Close ER. On intelligence, enlightenment, and the nature of reality. *Blog. 7 November 2020.* 2020, http://erclosetphysics.com.
208. Heilprin J: Higgs Boson Discovery Confirmed After Physicists Review Large Hadron Collider Data at CERN, *The Huffington Post*, 17 March, 2013.
209. CERN. The Large Hadron Collider. http://home.cern/topics/large-hadron-collider. 2016.
210. Planck M: Truth never triumphs, in. Edited by. circa 1950.
211. Close ER, Neppe VM. Empirically Verifiable New Approaches To Mass, Quanta, Gimmel, TRUE Units And Calculus: Section 7. In: Derivation and application of TRUE quantum calculus for the analysis of quantized reality. *IQNJ* 2021, this article;13: (1 (Part 2)); 84-88.
212. Close ER, Neppe VM. Why Is A New Calculus With Quantum Equivalence Units Needed? Section 9. In: Derivation and application of TRUE quantum calculus for the analysis of quantized reality. *IQNJ* 2021, this article;13: (1 (Part 2)); 87-92.
213. Baron ME: The origins of the Infinitesimal Calculus. North Chelmsford, MA: Courier Corporation, 1969
214. Lamb H: An elementary course in infinitesimal calculus. Cambridge, UK.: Cambridge University Press, 1924.
215. Close ER: The calculus of dimensional distinctions, in *Elements of mathematical theory of intellect (monograph)*. Edited by Brandin V. Moscow: Moscow Interphysica Lab. 2003. pp. 13-20.

216. Einstein A: Relativity, the special and the general theory—a clear explanation that anyone can understand. London: Routledge and Kegan Paul, 2001.
217. Einstein A. Explanation of the photoelectric effect with use of the quantum hypothesis of Planck: Concerning a heuristic point of view toward the emission and transformation of light. *Annalen der Physik* 1905;17: 132-148. http://einsteinpapers.press.princeton.edu/vol2-trans/100.
218. De Broglie L. Thesis, Paris: Recherches sur la théorie des quanta (Researches on the quantum theory). *Ann. de Physique* 1924;10: (3); 22-.
219. De Broglie L: The reinterpretation of wave mechanics. Paris, France: Académie des Sciences, Institut de France, 1924.
220. Fritzsch H: The fundamental constants: a mystery of physics. Hackensack, NJ: World Scientific Publishing Co. Pte. Ltd, 2009.
221. Neppe VM, Close ER. On Non-locality VI: Immediacy and hierarchies. *Journal of Consciousness Exploration and Research* 2015;6: (2); 127-134.
222. Einstein A: Relativity, the special and the general theory 15 Edition. New York: Crown Publishers, 1952.
223. Einstein A: Relativity and the problem of space. Series Relativity and the problem of space http://www.relativitybook.com/resources/Einstein_space.html. 1952 (English translation 1954)
224. Nave CR: De Broglie wavelength. Series De Broglie wavelength http://hyperphysics.phy-astr.gsu.edu/hbase/quantum/debrog2.htm. 2016.
225. Minkowski H, Lorentz HA, Einstein A, et al.: The principle of relativity: a collection of original memoirs: Dover, 1952.
226. Minkowski H. Raum und Zeit. *Physikalische Zeitschrift* 1908;10: 104–111.
227. Neppe VM, Close ER. On Non-locality II: Quantum physics and non-locality. *Journal of Consciousness Exploration and Research* 2015;6: (2); 97-102.
228. Neppe VM, Close ER. Quantum probability wave collapse or superposition is explained by vortical indivension (Part 12C). *IQNexus Journal* 2015;7: (3); 113.
229. Neppe VMC, Edward R. The infinite-finite boundary. *Dynamic International Journal of Exceptional Creative Achievement* 2012;1204: (1204); 2170-2179.
230. Nave CR: Transformation of quark flavors by the weak interaction. Series Transformation of quark flavors by the weak interaction http://hyperphysics.phy-astr.gsu.edu/hbase/Particles/qrkdec.html. 2016.
231. Anonymous: Electron rest mass. Series Electron rest mass https://en.wikipedia.org/wiki/Electron_rest_mass. 2018.
232. Farnham DL, Van Dyck RSJ, Schwinberg PB: Determination of the electron's atomic mass and the proton/electron mass ratio via Penning Trap Mass spectroscopy Series Determination of the electron's atomic mass and the proton/electron mass ratio via Penning Trap Mass spectroscopy 1995.
233. Close ER. From quarks to stars: blog. Retrieved November 25, 2016, http://www.erclosetphysics.com/. 2016.
234. Rajna G. Quarks take wrong turns. April 13, 2004, http://phys.org/news/2004-04-quarks-wrong.html. 2004.
235. Anonymous. Quarks. 2011, http://en.wikipedia.org/wiki/Quarks. 2011.
236. Dosch HG: Beyond the nanoworld: quarks, leptons, and gauge bosons. Wellesley: Peters, 2008.
237. Einstein A: *In this way the concept 'empty space' loses its meaning,* in Summary and simple solution to main problems of Albert Einstein's Relativity Theory: On truth and reality The wave structure of matter (WSM) in space. http://www.spaceandmotion.com/physics-einstein-problems-theory-of-relativity.htm.1950.

238. Anonymous: General relativity and the principle of inertia Series General relativity and the principle of inertia http://mathpages.com/home/kmath588/kmath588.htm. 2018.
239. Close ER. Video: What is mass? . Retrieved http://www.erclosetphysics.com/. 2016.
240. Lorentz HA. The relative motion of the earth and the aether. *Zittingsverlag Akad. V. Wet* 1892;1: 74-79.
241. Neppe VM, Close ER. On Non-locality I: Relative non-locality. *Journal of Consciousness Exploration and Research* 2015;6: (2); 90-96.
242. Schrödinger E. Probability relations between separated systems. *Proceedings of the Cambridge Philosophical Society* 1936;32: (3); 446-452.
243. Schrödinger E. Discussion of probability relations between separated systems. *Proceedings of the Cambridge Philosophical Society* 1935;31: (4); 555-563.
244. Fischer W, Blaskiewicz M, Brennan M, et al. Electron cloud measurements and simulations for the Brookhaven Relativistic Heavy Ion Collider. *PRST-AB 5* 2002;124401
245. Iriso U, Peggs S: Electron Cloud Phase Transitions. Series Electron Cloud Phase Transitions April 16, 2004. http://public.bnl.gov/docs/cad/Documents/Electron%20Cloud%20Phase%20Transitions.pdf. 2004.
246. Close ER, Neppe VM. Application Of TRUE Analysis To The Elements Of The Periodic Table: Section 17. In: Derivation and application of TRUE quantum calculus for the analysis of quantized reality. *IQNJ* 2021, this article;13: (1 (Part 2)); 117-125.
247. Cho A. Mass of the common quark finally nailed down. *Science Magazine* 2012.
248. Fowler M. Transforming Energy into Mass: Particle Creation. Retrieved 2016 August, http://galileo.phys.virginia.edu/classes/252/particle_creation.html. 2016
249. Patrignani C, , (Particle Data Group: >100 authors). The review of particle physics. *Chin. Phys. C* 2017 update, 2016 40, : 100001.
250. Close ER, Neppe VM. The Proton: Section 13. In: Derivation and application of TRUE quantum calculus for the analysis of quantized reality. *IQNJ* 2021, this article;13: (1 (Part 2)); 101-106.
251. Parker D. Elementary particles today. http://www.davidparker.com/janine/epntoday.html. 2018.
252. Gallinaro G, Morpurgo G. Preliminary results in the search for fractionally charged particles by the magnetic levitation electrometer. *Physics Letters* 1966;B 23 609.
253. Morpurgo G. Fourteenth international conference on high-energy physics. *Proceedings, Geneva: European Organization for Nuclear Research* 1968.
254. Einstein A. Collected quotes from Albert Einstein. http://rescomp.stanford.edu/~cheshire/EinsteinQuotes.html. 2015.
255. Close ER, Neppe VM. More questions answered on the elements, TRUE and gimmel (Part 17). *IQNexus Journal* 2015;7: (4); 82-102.
256. Close ER, Neppe VM. The TRUE units of measurement: Understanding the Periodic Table Of The Elements by applying the TDVP 9-dimensional vortical model. In submission.
257. LoSecco JM, Reines F, Daniel S. The search for proton decay. *Scientific American* 1985;252: 54.
258. Hoffmann R, Minkin VI, Carpenter BK. Ockham's Razor and Chemistry *HYLE—International Journal for Philosophy of Chemistry,* 1997;3: 3–28.
259. Ariew R: Ockham's Razor: A Historical and Philosophical Analysis of Ockham's Principle of Parsimony:Dissertation, University of Illinois. Urbana-Champaign, Ill, 1976.
260. Palmer J: *Dulling Occam's razor: The role of coherence in assessing scientific knowledge claims,* in. European Journal of Parapsychology, 773-82: 1987.
261. An1, Zheng X, Aniol K, et al. Precision measurement of the neutron spin asymmetry and spin-flavor decomposition in the valence quark region. *Physical Review Letters* 2004;92: (012004).

262. Pauli O. Six different types of quarks. http://www.ehow.com/info_8248693_six-different-types-quarks.html. 2015.
263. Watson A: The quantum quark. Cambridge, U.K.: Cambridge University Press, 2004.
264. Donoghue JF, Dutta K, Ross A. Quark and lepton masses and mixing in the landscape. *Physical Review. D, Particles Fields* 2006;73: (11); 11113002-11113002.11113018.
265. Amsler C, Particle-Data-Group C. Review of particle physics – quark model. *Phys. Lett* 2008;B 667: (1); 1016.
266. Aczel A: Fermat's last theorem: unlocking the secret of an ancient mathematical problem. New York: Four Walls Eight WIndows, 1996.
267. Close ER: Appendix B: 1965 Proof of Fermat's Last Theorem, in *The Book of Atma*. Edited by. New York: Libra Publishers. 1977. pp. 93-99.
268. Close ER, Neppe VM. Fermat's Last Theorem and the demonstration of vortical movements. *Dynamic International Journal of Exceptional Creative Achievement* In press.
269. Kleiner I. From Fermat to Wiles: Fermat's last theorem becomes a theorem. *Elem. Math* 2000;55: 19-37.
270. Singh S: Fermat's Enigma: The epic quest to solve the world's greatest mathematical problem. Notting Hill, UK: Fourth Estate, Ltd., 1997
271. Georgia State University. Big bang nucleosynthesis. In Hyperphysics http://hyperphysics.phy-astr.gsu.edu, at http://hyperphysics.phy-astr.gsu.edu/hbase/Astro/bbnuc.html. 2005.
272. Anonymous. Neutron. 2011, http://en.wikipedia.org/wiki/Neutron. 2011.
273. Schroeder GL: Genesis and the big bang. New York: Harper Collins, 1990.
274. Close ER, Neppe VM. Applying Hydrogen-1 And Deuterium: The Origin Of Mass: Section 15. In: Derivation and application of TRUE quantum calculus for the analysis of quantized reality. *IQNJ* 2021, this article;13: (1 (Part 2)); 108-111.
275. Close ER, Neppe VM. Atomic materialism, the periodic table and generalizing cosomologically. Part 3. *World Institute for Scientific Exploration (WISE) Journal* 2015;4: (4); 13-17.
276. Anonymous. Beta decay. https://en.wikipedia.org/wiki/Beta_decay. 2018.
277. Schatz H, Gupta S, Moller P, et al. Strong neutrino cooling by cycles of electron capture and beta-decay in neutron star crusts. *Nature* 2014;505: (7481); 62-65. http://www.ncbi.nlm.nih.gov/pubmed/24291788.
278. Morales AI, Benlliure J, Kurtukian-Nieto T, et al. Half-life systematics across the N=126 shell closure: role of first-forbidden transitions in the beta decay of heavy neutron-rich nuclei. *Phys Rev Lett* 2014;113: (2); 022702. http://www.ncbi.nlm.nih.gov/pubmed/25062171.
279. Tain JL, Valencia E, Algora A, et al. Enhanced gamma-ray emission from neutron unbound states populated in beta decay. *Phys Rev Lett* 2015;115: (6); 062502. http://www.ncbi.nlm.nih.gov/pubmed/26296113.
280. Madurga M, Paulauskas SV, Grzywacz R, et al. Evidence for Gamow-Teller Decay of ^{78}Ni Core from Beta-Delayed Neutron Emission Studies. *Phys Rev Lett* 2016;117: (9); 092502. http://www.ncbi.nlm.nih.gov/pubmed/27610848.
281. Anonymous. Physics beyond the standard model. Retrieved 2011, http://en.wikipedia.org/wiki/Beyond_the_Standard_Model. 2011.
282. Anonymous. Standard model. 2011, http://en.wikipedia.org/wiki/Standard_Model. 2011.
283. Trimble V. Existence and nature of dark matter in the universe. *Annual review of astronomy and astrophysics* 1987;25: 425–472.
284. Anonymous. Abundance in the universe of the elements. http://periodictable.com/Properties/A/UniverseAbundance.html. 2016.

285. Anonymous. Unified atomic mass unit. Wikipedia, https://en.wikipedia.org/wiki/Unified_atomic_mass_unit. 2018.
286. Close ER, Neppe VM. Verifying the CoDD Mass of the Hydrogen Atom with Empirical Data: Section 16. In: Derivation and application of TRUE quantum calculus for the analysis of quantized reality. *IQNJ* 2021, this article;13: (1 (Part 2)); 112-116.
287. Close F: Neutrinos. Oxford, England: Oxford University Press., 2010.
288. Giunti C, Studenikin A. Neutrino electromagnetic interactions: A window to new physics. *Reviews of Modern Physics.* 2015;87: (2); 531–591, arXiv:1403.6344
289. Basdevant J-L, Rich J, Spiro M: β decay of nuclei in *Fundamentals in nuclear physics: From nuclear structure to cosmology*. Edited by Basdevant J-L, Rich J, Spiro M. New York: Springer. . 2005. pp. Chapter 4: 4.3.2, 202.
290. Anonymous. Mass balance. https://en.wikipedia.org/wiki/Mass_balance. 2018.
291. Anonymous. Tau neutrino. 2011, http://en.wikipedia.org/wiki/Tau_neutrino. 2011.
292. Anonymous. Muon neutrino. 2011, http://en.wikipedia.org/wiki/Muon_neutrino. 2011.
293. Baez JC: Neutrinos and the Mysterious Maki-Nakagawa-Sakata Matrix. Series Neutrinos and the Mysterious Maki-Nakagawa-Sakata Matrix http://math.ucr.edu/home/baez/neutrinos.html. 2005.
294. Anonymous. Electron neutrino. 2011, http://en.wikipedia.org/wiki/Electron_neutrino. 2011.
295. Coursey JS, Schwab DJ, Tsai JJ, et al. Atomic weights and isotopic compositions with relative atomic masses. https://www.nist.gov/pml/atomic-weights-and-isotopic-compositions-relative-atomic-masses. 2015.
296. Close ER, Neppe VM. Specific challenges involving the Close and Neppe research: The fourth conundrum: applying the Triadic Dimensional Distinction Vortical Paradigm (TDVP) constructs in our dimensional calculations. *IQNexus Journal* 2015;7: (2); 31-33.
297. Close ER, Neppe VM. The nine-dimensional finite spin model (Part 14). *IQNexus Journal* 2015;7: (4); 70.
298. Close ER, Neppe VM. The seventh conundrum: the mathematical derivation of the Cabibbo mixing angle in fermions. *IQNexus Journal* 2015;7: (2); 41-43.
299. Close ER, Neppe VM. The sixth conundrum: theoretical knowledge on deriving the Cabibbo angle. *IQNexus Journal* 2015;7: (2); 39-40.
300. Cabibbo N. Unitary symmetry and leptonic decays. *Physical Review Letters* 1963;10: (12); 531–533.
301. Leibniz G: Why is there something rather than nothing? The sufficient reason [...] is found in a substance which [...] is a necessary being bearing the reason for its existence within itself.[17]:The Monadology: An Edition for Students. p. 135. Pittsburgh, PA: University of Pittsburgh Press, 1714. Nicholas Rescher, trans., 1991.
302. Tegmark M: Our mathematical universe: My quest for the ultimate nature of reality. New York: Knopf, 2014.
303. Neppe VM, Close ER. How some conundrums of reality can be solved by applying a finite 9-D spinning model. *IQNexus Journal* 2015;7: (2); 7-88.
304. Close ER, Neppe VM. The tenth conundrum: weak universality based on the 9D findings. *IQNexus Journal* 2015;7: (2); 50.
305. Neppe VM, Close ER. The seventeenth conundrum: other significant implications for the future of appreciating and understanding our reality based on the 9D spin findings. *IQNexus Journal* 2015;7: (2); 81-83.
306. Neppe VM, Close ER. Reality begins with consciousness: Survival and life itself —Is there a how? *Proceedings of 2013 Conference Academy for Spiritual and Consciousness Studies.* 2013: 1-17.
307. Neppe VM. Perspective: why 'meaningful evolution' is a formidable model of evolution: Part 8. In Meaningful Evolution, abiogenesis and life solved through gimmel: Translating from the infinite

continuity to the discrete finite by applying the Neppe-Close Triadic Dimensional Vortical Paradigm (TDVP). *IQNexus Journal* 2019;11: (2); 62-76.
308. Neppe VM, with Close ER. Meaningful Evolution, abiogenesis and life solved through gimmel: Translating from the infinite continuity to the discrete finite by applying the Neppe-Close Triadic Dimensional Vortical Paradigm (TDVP). *IQNexus Journal* 2019;11: (2); 5-76.
309. Close ER, Neppe VM. Defining the basic units of quantum mathematics for a quantum calculus: Section 3: In: Derivation and application of TRUE quantum calculus for the analysis of quantized reality. 2018, In submission.
310. Huxley A: The perennial philosophy. UK: Harper & Brothers, 1945.
311. Close ER, Neppe VM. The fifth conundrum: applying mathematical dimensional extrapolation non-specifically in our dimensional calculations to demonstrate multidimensionality. *IQNexus Journal* 2015;7: (2); 34-38.
312. Gödel K: On formally undecidable propositions of Principia Mathematica and related systems tr. B. Meltzer, . New York: Dover reprint of the Basic Books edition., 1992.
313. Brown GS: Laws of form. London: Allen and Unwin, 1969.
314. Bohr N: The quantum of action and the description of nature. Cambridge, England: Cambridge University Press., 1934
315. Schrödinger E: Mind and matter. Cambridge, England: Cambridge University Press, 1958.
316. DeWitt BS. Quantum theory of gravity: the canonical theory. *Phys. Rev.* 1967;160: (5); 1113-1148. http://www.physics.drexel.edu/~vkasli/phys676/Notes%20for%20a%20brief%20history%20of%20quantum%20gravity%20-%20Carlo%20Rovelli.pdf.
317. Neppe VM, Close ER. TDVP: a paradigm shift that works —how the Triadic Dimensional Distinction Vortical Paradigm challenges conventional scientific thinking and explains reality. *Telicom* 2014;27: (1); 24-42.
318. Neppe VM. 'Ethicospirituobiopsychofamiliosocioethnicocultural': A Legitimate Approach: Section 6. *J Psychol Clin Psychiatry* 2018;9: (3: 00507); 12-16.
319. Neppe VM, Close ER. Failure to replicate: Vortical indivension explains an important psi and every-day life finding (Part 12B). *IQNexus Journal* 2015;7: (3); 112.
320. Collins CB, Hawking S. Why is the universe isotropic? *Astrophysical Journal* 1973;180: 317-334.
321. Hawking S: The theory of everything. Beverly Hills: New Millennium Press, 2007.
322. Hawking S, Mlodiow L: The grand design. New York: Random House, 2010.
323. Hawking S, Penrose R: The nature of space and time. Princeton: Princeton University Press, 1996.
324. Bailint D, Love A: Kaluza-Klein theories. Series Kaluza-Klein theories http://www.het.brown.edu/people/danieldf/literary/eric-KKtheories.pdf. 1987.
325. Straumann N: On Pauli's invention of Non-Abelian Kaluza-Klein Theory in 1953. Series On Pauli's invention of Non-Abelian Kaluza-Klein Theory in 1953 http://arxiv.org/pdf/gr-qc/0012054v1.pdf. 2008.
326. Van der Schaar JP. Kaluza Klein theory. http://www-th.phys.rug.nl/~schaar/htmlreport/node12.html. 1998.
327. Rauscher EA, Targ R. The speed of thought: Investigation of a complex space-time metric to describe psychic phenomena. *Journal of Scientific Exploration* 2001;15: (3); 331-354. http://www.scientificexploration.org/jse/abstracts/v15n3a2.html.
328. Neppe VM. The dyadic, creative Interface with Vernon Neppe (YouTube) On TDVP and the Neppe-Close relationship. New Thinking Allowed, https://www.youtube.com/watch?v=AtMQdS8_Vck&t=2123s. 2018.

329. Neppe VM, Close ER. Applying the paradigm shift to the triadic dimensional distinction vortical paradigm (TDVP) *Dynamic International Journal of Exceptional Creative Achievement* 2012;1212: (1212); 2538-2547.
330. Close ER, Neppe VM. Introductory perspective to the God matrix. Part 2. *World Institute for Scientific Exploration (WISE) Journal* 2015;4: (4); 5-12.
331. Neppe VM, Close ER: The God Matrix: Answers 2 First Edition. Seattle: Brainvoyage.com, 2016 (In Press).
332. Neppe VM, Close ER. Why lower dimensional feasibility (LFAF): Application to metadimensionality *Dynamic International Journal of Exceptional Creative Achievement* 2012;1209: (1209); 2352-2360.
333. Peierls R: *Wolfgang Ernst Pauli, 1900–1958: Biographical memoirs of Fellows of the Royal Society.,* in, Vol. 5. ( ) pp. 186 doi:10.1098/rsbm.1960.0014: 1960.
334. Neppe VM, Close ER. Re-examining the fundamental ideas of scientific change: Part 1 *IQNexus Journal* 2016;8: (1); 8-11.
335. Close ER, Neppe VM. Applying hydrogen-1 and deuterium: The origin of mass: Section 8: In: Derivation and application of TRUE quantum calculus for the analysis of quantized reality. 2018, In submission.
336. Close ER, Neppe VM. The origin of mass: Section 5: In: Derivation and application of TRUE quantum calculus for the analysis of quantized reality. 2018, In submission.
337. Close ER, Neppe VM. Conservation of angular momentum and electron spin: Section 4: In: Derivation and application of TRUE quantum calculus for the analysis of quantized reality. 2018, In submission.
338. Close ER, Neppe VM. Why a new calculus with quantum equivalence units is needed: Section 2: In: Derivation and application of TRUE quantum calculus for the analysis of quantized reality. 2018, In submission.
339. Close ER, Neppe VM. Defining the basic units of quantum mathematics for a quantum calculus: Section 3: In: Empirically verifiable new approaches to mass, quanta, gimmel, true units and calculus. 2018, In submission.
340. Close ER, Neppe VM. Quantum mathematics for quantum reality: Section 1. in Derivation and application of TRUE quantum calculus for the analysis of quantized reality. 2018 In submission; : ( ).
341. Dossey L. Distant nonlocal awareness: a different kind of DNA. *Altern Ther Health Med* 2000;6: (6); 10-14, 102-110. http://www.ncbi.nlm.nih.gov/pubmed/11076438.
342. Meyer SC: Signature in the Cell: DNA and the Evidence for Intelligent Design. Panama City, FL: HarperOne 2009.
343. Close ER, Neppe VM. Preliminary ideas on gimmel that need confirmation. Part 4. *World Institute for Scientific Exploration (WISE) Journal* 2015;4: (4); 18-20.
344. Neppe VM, Close ER. Translating some conundrums of the universe by applying a 9 dimensional spinning model of finite reality: References. *IQNexus Journal* 2015;7: (2); 84-88.
345. Close ER, Neppe VM. The twelfth conundrum: The thought experiment replication of 9 dimensional spin. *IQNexus Journal* 2015;7: (2); 57-59.
346. Close ER, Neppe VM. Support for the hypothesis of a 9-dimensional spin finite reality model (Part 7). *IQNexus Journal* 2015;7: (4); 33-35.
347. Close ER, Neppe VM. The ninth conundrum: two different solutions to electron rotation *IQNexus Journal* 2015;7: (2); 46-49.
348. Close ER, Neppe VM. The eighth conundrum: angular momentum and intrinsic electron spin. *IQNexus Journal* 2015;7: (2); 44-45.
349. Berto FJ: There's Something about Gödel: The Complete Guide to the Incompleteness Theorem New York, NY: Wiley and Sons 2010.

350. Close ER, Neppe VM. A new paradigm describing the nature of reality and what it implies for the future of science: Preface (Part 2). *IQNexus Journal* 2015;7: (4); 16-18.
351. Close ER, Neppe VM. Where does Quantum Entanglement fit the triadic dimensional distinction vortical paradigm (TDVP) model *Dynamic International Journal of Exceptional Creative Achievement* 2012;1208: (1208); 2342 -2351.
352. Neppe VM. Applying feasibility, falsifiability, and certainty in scientific method to Forensic Science: Raising the Bar in Forensic Science: Keynote address, Interdisciplinary Symposium. . *Program, 70th Scientific Meeting, American Academy of Forensic Science* 2018: 21.
353. Neppe VM: Validity, reliability, feasibility, versatility and applications of the self-rated Neppe Extended Symptom Screen (NESS) in neuropsychiatry, behavioral neurology and psychiatry as a clinical and forensic assessment. Series Validity, reliability, feasibility, versatility and applications of the self-rated Neppe Extended Symptom Screen (NESS) in neuropsychiatry, behavioral neurology and psychiatry as a clinical and forensic assessment. http://neuro.psychiatryonline.org/toc/jnp/27/2. 2016.
354. Neppe VM, Close ER. Science, multidimensionality, and feasibility: Section 4. *IQ Nexus Journal* 2017;9: (1); 30-41.
355. Close ER, Neppe VM. Filling in the gaps of volumetric stability (Part 18). *IQNexus Journal* 2015;7: (4); 103-109.
356. Close ER, Neppe VM. The tertiary level of symmetric stability – molecular bonding (Part 16). *IQNexus Journal* 2015;7: (4); 78-81.
357. Close ER, Neppe VM. Stability and particle bonding (Part 15). *IQNexus Journal* 2015;7: (4); 71-77.
358. Popper K: A world of propensities London: Thoemmes, 1990.
359. Popper K: Replies to my critics, in *The Philosophy of Karl Popper, Part II*. Edited by Schilpp PA. Illinois: The Open Court Publishing Company. 1974.
360. Close ER: Infinite continuity: a theory integrating relativity and quantum physics. Los Angeles: Paradigm Press, 1990.
361. Neppe VM, Close ER. TDVP and life tracks: Speculations that fit the model (Part 13F). *IQNexus Journal* 2015;7: (3); 129-130.
362. Neppe VM, Close ER. TDVP propositions on survival and life (Part 13G). *IQNexus Journal* 2015;7: (3); 130-133.
363. Neppe VM: *Vortex pluralism,* in American Philosophical Association: The Society for the Anthropology of Consciousness. Seattle, WA: 1996.
364. Neppe VM. Vortex pluralism: a new philosophical perspective. http://www.pni.org/philosophy/vortex_pluralism.shtml/. 1997.
365. Neppe VM: Vortex n-dimensional pluralism: scientific empiricism, the heuristic approach and natural law. Seattle, WA, USA: 2003.
366. Neppe VM: Vortex N-dimensionalism: a philosophical–scientific paradigm and alternative to mind-body theories. Seattle, WA, USA: 2003.
367. Neppe VM, Close ER. Consciousness: A brief voyage linked with psi and "non-locality" (Part 7). *IQNexus Journal* 2015;7: (3); 65-67.
368. Neppe VM, Close ER. Integrating aspects of the EPIC consciousness model (Part 3) *Journal of Psychology and Clinical Psychiatry* 2014;1: 00036: (6); 8-14.
369. Neppe VM, Close ER. Explaining consciousness: an EPIC re-examination (Part 2): the how, the what, the why and the where *Journal of Psychology and Clinical Psychiatry* 2014;1: 00036: (6); 4-8.
370. Neppe VM, Close ER. Re-examining the consciousness concept (Part 1) *Journal of Psychology and Clinical Psychiatry* 2014;1: 00036: (6); 1-4.

371. Morgart E. On Neppe, V.M., Close, E.R.,The theory of everything has 9 dimensions: From “USA Today Magazine”. *IQ Nexus Journal* 2016;8 (3); 73-79.
372. Neppe VM, Close ER. Does the triadic dimensional distinction vortical paradigm (TDVP) qualify as a Theory of Everything (TOE)? *Dynamic International Journal of Exceptional Creative Achievement* In press; : ( ); .
373. Neppe VM, Close ER. The value of the triadic dimensional distinction vortical paradigm (TDVP) as a Theory of Everything (TOE). *Dynamic International Journal of Exceptional Creative Achievement* 2012;1212: (1212); 2548-2558.
374. Neppe VM, Close ER. How does the triadic dimensional distinction vortical paradigm (TDVP) compare as a theory of everything (TOE)? *Dynamic International Journal of Exceptional Creative Achievement* 2012;1211: (1211); 2460-2467.
375. Tain JL, Valencia E, Algora A, et al. Enhanced gamma-ray mmission from neutron unbound states populated in beta decay. *Phys Rev Lett* 2015;115: (6); 062502. http://www.ncbi.nlm.nih.gov/pubmed/26296113.
376. Anonymous. Gluon. 2011, http://en.wikipedia.org/wiki/Gluon. 2011.
377. Neppe VM. What’s the matter with matter with Vernon Neppe (YouTube). New Thinking Allowed, https://youtu.be/Aa4yOKxiBNA. 2018.
378. Close ER. Clarification and explanation of FLT65: A 1965 proof of Fermat’s Last Theorem. *Dynamic International Journal of Exceptional Creative Achievement* In press.

Puzzles, Riddles & Brainteasers

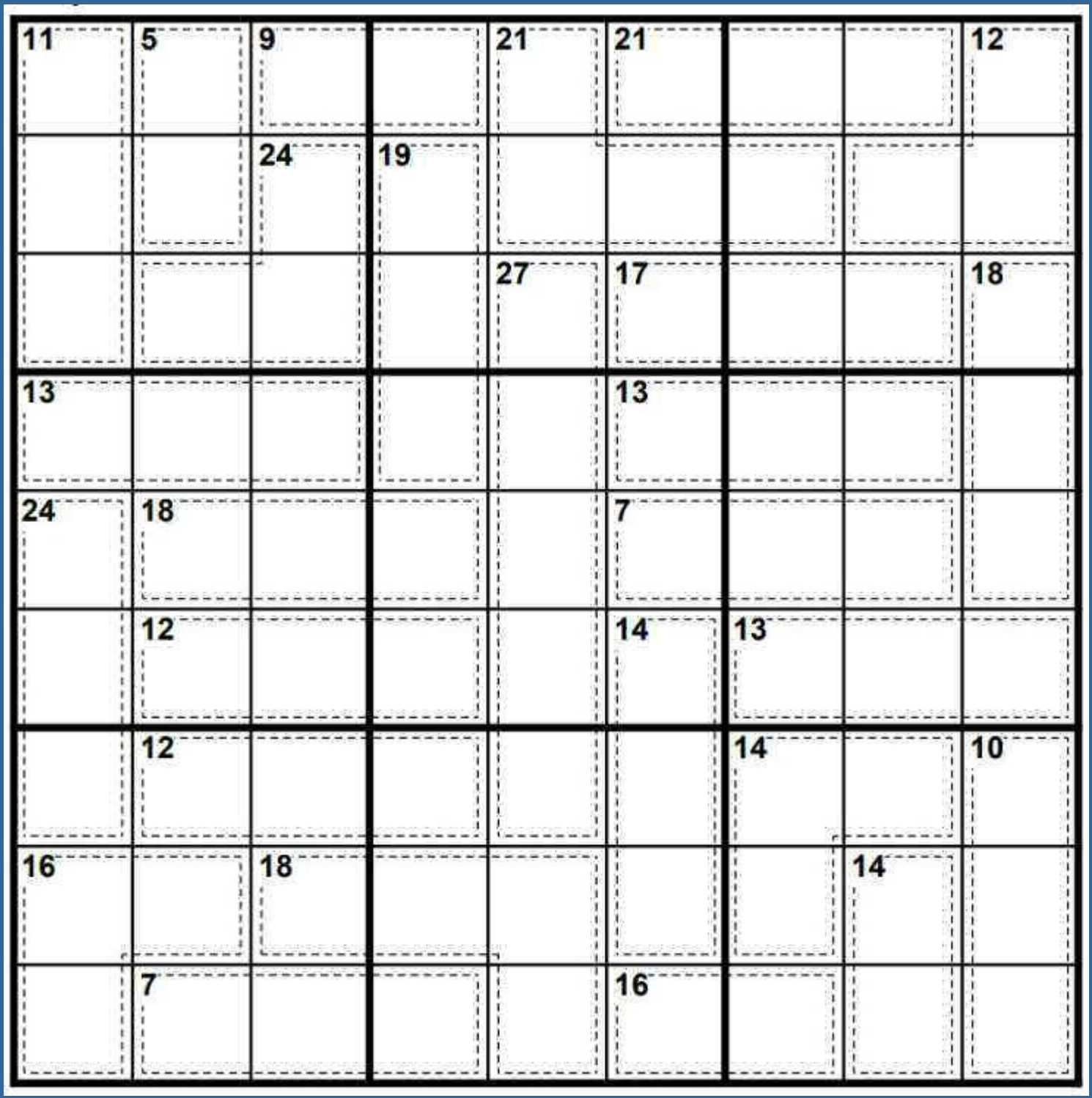
Next three months calendar

Killersudoku solution from IQ Nexus Journal, issue 12 Vol. 4

10 7	3	6 2	4	14 6	8	6 5	1	25 9
18 9	8	16 4	1	35 2	12 5	7	3	6
1	6	5	15 9	7	3	4	15 2	8
21 4	9	8	6	3	8 7	1	5	9 2
18 5	7	3 1	2	8	15 9	6	4	3
6	11 2	8 3	5	1	6 4	24 9	8	7
8	1	24 9	7	5	2	12 3	6	16 4
15 3	4	6	8	9	1	2	7	5
2	12 5	7	7 3	4	14 6	8	10 9	1

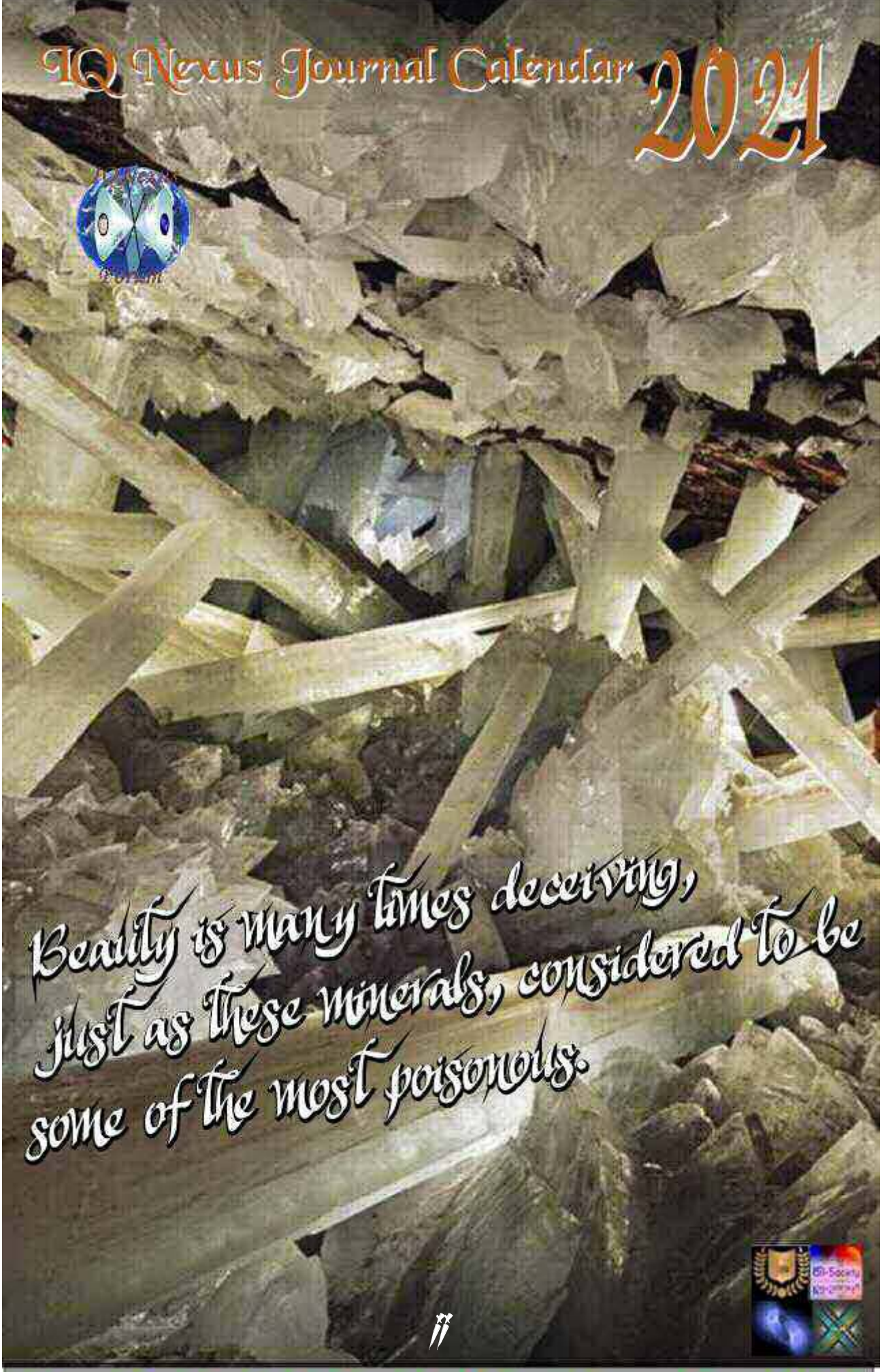
Rules

As in regular sudoku, every cell in each row, column, and nonet must contain a unique digit. In other words, each row, column, and nonet must contain all the digits from one to nine.
The values of the cells a cage must sum up to the total for that cage.
The values of the cells in a cage must be unique.



Solution to this puzzle will be published in the next issue of the IQ Nexus Journal

IQ Nexus Journal Calendar 2021



Cinnabar - HgS

IQNJ

2021

April

March						
S	M	T	W	T	F	S
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30	31			

May						
S	M	T	W	T	F	S
						1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30	31					

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
				1	2	3
4 ◑	5	6	7	8	9	10 Good Friday
11 ●	12	13	14	15	16	17
18	19 ◐	20	21	22	23	24
25	26 ○	27	28	29	30	

Crocidolite (blue asbestos)

IQNJ

April
S M T W T F S
1 2 3
4 5 6 7 8 9 10
11 12 13 14 15 16 17
18 19 20 21 22 23 24
25 26 27 28 29 30

May 2021

June
S M T W T F S
1 2 3 4 5
6 7 8 9 10 11 12
13 14 15 16 17 18 19
20 21 22 23 24 25 26
27 28 29 30

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
						1
2	3 ◗	4	5	6	7	8
9	10	11 ●	12	13	14	15
16	17	18 Victoria Day	19 ◐	20	21	22
23	24	25	26 ○	27	28	29
30	31					

Erionite

IQNJ

May

S	M	T	W	T	F	S
						1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30	31					

June 2021

July

S	M	T	W	T	F	S
				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	31

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
		1 ◗	2	3	4	5
6	7	8	9	10 ●	11	12
13	14	15	16	17 ◐	18	19
20	21	22	23	24 ○	25	26
27	28	29	30			

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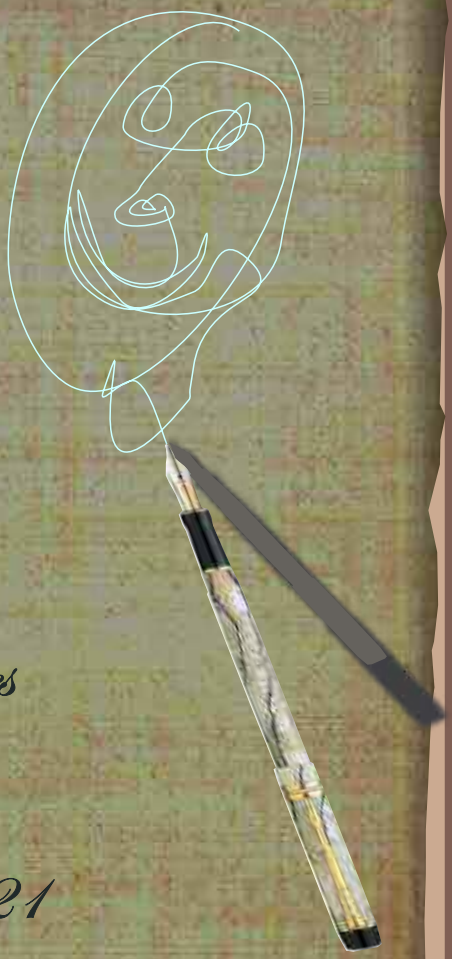
IQ Nexus



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