

12th August 2021

Chair: Mike Horner

A Demonstration of Potential Connection of Electro-Weak Coupling to Unitary Weak-Boson Kinematics

Presenter: James Lindsay, Professor of Physics and Computational Physics Lab, Howard University, Washington, DC.

Abstract:

The founding fathers envisioned ANPA as an inclusive forum dedicated to exploring alternative formulations of natural philosophy and physics. An initial path of exploration of particular interest to many involved the relationship of the combinatorial hierarchy to the coupling constants of fundamental interactions in physics, as well as formulations of space and time consistent with quantum notions of measurements. Even *given* a complete, consistent formulation of the fundamentals of this combinatorial approach, it was still necessary to develop a formulaic (ancillary) apparatus for implementation and critical examination relative to phenomenology in high energy physics and cosmology. This requires the inclusion of the fundamental properties of unitarity (conservation of probability), Lorentz covariance (relativity and pair creation), cluster decomposability (“classically” dis-entangled systems that can yet interact), and connections to gravitation, all preferably in a non-perturbative formalism.

An ANPA inspired formulation inclusive of the required physical properties developed using quantum field theory will be presented. Unitary mixing of fields consistent with the standard model of particle physics will be perused, and kinematic relationships supplemental to the standard model will be demonstrated. All efforts will be made to cherish the inter/multi-disciplinary and inclusive ethos of ANPA during the presentation. To conclude the presentation, an intriguing path towards demonstrating connections between *any* (combinatorial or otherwise) derived coupling constants and the masses of physical particles will be demonstrated.

Grand Unification

Presenter: Dr Peter Rowlands, Department of Physics, University of Liverpool

Abstract:

Around the time of the completion of the Standard Model of particle physics in the 1970s, schemes were put forward for unifying the three gauge interactions (electric, strong and weak) using the renormalization equations at an energy approaching the Planck mass. Though these looked promising, the exact unification never materialised, and doubts have been raised about whether

this Grand Unification can be achieved. It may be possible, however, to create Grand Unification at the Planck mass if we start with a radical examination of the nature of the colour model of quarks.

Calculus and Non-Commutative Worlds

Speaker: Louis H Kauffman, Professor of Mathematics in the Department of Mathematics, Statistics, and Computer science at the University of Illinois, Chicago.

Abstract:

There are many reasons for reformulating calculus in a non-commutative framework. Once this is done one defines derivatives as commutators.

Thus one may write $DF = FN - NF = [F,N]$ where N is a suitable representative for that derivative. The simplest and most fundamental reason for doing this is that discrete calculus can be formulated in this way. The talk will begin by explaining this fact of mathematical life. Discrete derivatives are actually all we have prior to the fantasy of limits that makes for the context of continuity and classical calculus. Derivatives as commutators seldom commute with one another. Derivatives that do not commute with one another are the signals of curvature in places where spaces have not yet appeared. By starting in this place of the non-commutative algebra of differences, we find that a remarkable body of the formalism of physics emerges naturally from the pen that writes the noncommutative calculus. In particular, we see how the patterns of gauge theory appear and how they begin to be related with relativity and quantum theory.

In this talk we will go back to Hermann Weyl's original idea to unify gravity and electromagnetism that led him to discover gauge theory, see how it is related to non-commutative worlds, and with the relationship of these worlds to quantum theory. Please note that the author is not offering a theory of everything. He is offering a mathematical starting place for everything.

Shouldn't that be compared with foundational enterprises such as Category Theory or the Theory of Sets or the possibilities of a Distinction?

Of course it should. It is hoped that this talk can elucidate some of that as well.

o, oo, ooo, ...

Divyamaan Sahoo, Master of Fine Arts, The Art Institute of Chicago

Abstract:

In the making of a circular tally mark, a rotational direction is indicated. The right-hand grip rule in electromagnetics (and general orientations of curves and surfaces) states that for the right hand in a thumbs-up grip, if the direction of current follows the direction of flow from the palm to all the curled-up fingertips, then the direction the thumb is pointing indicates the direction of the induced magnetic field. As discovered by Ørsted, the magnetic field indicated by the thumb is circular. The right-hand grip rule can be continued onto itself along the direction of the thumb to make a circle of circular tally marks, which is itself a circular tally mark, and a rotational direction is indicated. The right-hand grip rule applies to the circle of circular tally marks, and can be continued onto itself to make a circle of circular tally marks of circular tally marks ...

o, oo, ooo, ... is "o" in "Laws of Form -- A Fiftieth Anniversary" (World Scientific, 2021), "oo" in "George Spencer-Brown's "Design with the NOR": With Related Essays" (Emerald, 2021), and "ooo" in a Special Issue of the Journal of Space Philosophy for the legacy for Dr. Joel Isaacson.

13 August 2021

Chair: Peter Rowlands

Visualizing and working with geometric objects in higher dimension space

Presenter: Samuel Lomonaco, Professor of Computer Science & Electrical Engineering, University of Maryland Baltimore County (UMBC)

Abstract:

In this talk, we focus on how to visualize geometric objects in four- and five-dimensional space using the method of hyperplane cross sections. We will begin by visualizing knotted 2-spheres in 4-space (i.e., "knotted balloons" in 4-space), knotted tori (i.e., "knotted innertubes"), knotted Klein bottles, and more. We will then move on to visualizing geometric objects in 5-space.

Should time permit, we will show how the fundamental group can be used to systematically decompose the complements of geometric objects in 3-, 4-, and 5-D space into basic geometric building blocks, called cells. This cell decomposition can then be used to classify embeddings.

The aperiodicity of the primes

Presenter: Grenville Croll, Computer Scientist and Mathematician

Abstract:

We examine the properties of prime numbers, both individually and collectively, through the lens of the binary number system.

Really Really Real Numbers

Presenter(s): Michael Heather & Nick Rossiter

Abstract:

Number is a three level structure of which the natural numbers are only a first order model. At the third level of the Universe are the numbers one, the exponential and π .

Topology, Evolution and Knots

Presenter: John S. Torday, Professor of Pediatrics, Obstetrics and Gynecology Evolutionary Medicine
UCLA

Abstract:

The solution to the problem of evolution has proven refractory to experimentation- how fish have evolved into Man, for example- because evolution is thought to be due to random mutations, obviating the opportunity to test such a mechanism, leaving only correlations and associations, which do not show causation. Topology concerns itself with how geometric objects maintain themselves under continuous deformations. Knot Theory is the study of mathematical knots, inspired by the knots that occur in everyday life. It occurred to us that since knots tie things together, they are similar in kind to the cell-cell signaling mechanisms that tie physiologic traits together during development, culminating in integrated physiology, tied together by homeostasis under the control of hormones that accommodate the 'deformations' caused by stressful conditions- environmental, disease-related and otherwise. All of the above interrelate due to the Quantum Mechanical origin of life through Quantum Entanglement, referencing non-local phenomena in the Cosmos. The test of the validity of this hypothesis as 'hard science' is its predictive value. Based on consciousness being derivative of physiology as cell-cell communication, **mind= ambiguity/consciousness.**

14th August 2021

Chair: Barbara J Gabrys

Quantised Inertia

Presenter: Dr Mike McCulloch SoBMS, Plymouth University

Abstract:

Quantized inertia states that the phenomenon we know as inertia arises because an acceleration in any direction produces both an excited quantum vacuum (Unruh radiation), and an information horizon in the opposite direction to the acceleration vector that damps the quantum vacuum there and pulls the object back against its acceleration. This theory predicts inertial mass and has excellent support from astrophysical data. It also predicts that if we confine mass/energy into a small volume and add a synthetic horizon (metal plates) to damp the vacuum asymmetrically, then we can produce propellant-less propulsion large enough to enable launch and interstellar travel.

Since 2018, DARPA DSO has funded tests of this theory. So far, there have been several positive results, and one negative, and much controversy, but the theory and the data both indicate that the

thrust can be maximised by using higher accelerations and very close plates. In the next phase of the DARPA project we aim to produce thrusts big enough to be compelling.

<https://www.youtube.com/watch?v=fnNKC82wUmY>

Pythagorean Epistemology

Presenter: Nicola Graves-Gregory Mathematician, History of and Human Mathematics

Abstract:

True reality is ineffable, beyond human cognition. (“Humankind cannot bear much reality.”
T.S.Eliot)

Awareness is our intelligent sentience beyond words. We can observe the wide, intelligent sentience of babies and small children, which gradually gets focussed into narrower realms of consciousness. Within these realms we discover or create concepts.

I posit an ordering of human cognition, a 21st century Pythagorean epistemology as outlined below. Read ‘>’ as, ‘is greater than and includes’.

Reality > our awareness,

Our awareness > our consciousness,

Our consciousness > our language,

Our language > our reason,

Our reason > our logic.

Mathematics is a language.

George Spencer Brown observed that “The more a being cultivates consciousness at the expense of awareness, the stupider it becomes”.

Sub Quantum Chemistry

Presenter: John Williamson

Abstract:

A development of relativistic quantum mechanics and electromagnetism allows new insights into the sub-quantum dynamics of complex material systems: atoms, molecules and the solid state. The new paradigm allows thinking into the physics of such systems at different levels, including those deeper than that of the "quantisation" itself. As well as the familiar electric and magnetic field effects, the underlying effects of quantum spin become manifest as the geometrical symmetries are broken by the formation of systems that are not perfectly spherical, as is the case in most materials. The new approach allows, among other things, insight into the quantum physics of the geometry of formation of coherent, harmonic, mutually interacting systems of elementary particles: thus moving the scope of application of the new relativistic quantum mechanics into the realm of quantum chemistry.

This changes EVERYTHING!
1900 to 2021 from Bohm to Biosemiotics

Presenter: Mike Horner

Abstract:

After a brief personal introduction explaining the authors interest in social systems, a Sociology of Absences is introduced as a framework. The title is explained, and EVERYTHING is restated as "All there is" justifying the wide scope of the talk.

Planck's 3-word utterance was the start of the Quantum era and in principle the death of classical / Newtonian thinking. Using the Sociology of Absences, we examine the histories and the significance of several polymaths, David Bohm, Stephane Lupasco, Owen Barfield, Gregory Bateson. Their individual unique contributions are drawn together in the context of Biosemiotics and the Biosphere.

The new understanding of EVERYTHING makes clear how we have continued with a material mechanistic model in which everything is fragmented. We have so far neglected the leading thinkers who have argued for a holistic living system (EVERYTHING) seen as a unity.

A final section addresses how we can update our worldviews and so accept the planet is a Biosphere in which there is a responsibility for humans in what we do and how we think and behave.

