TOWARDS A NEW UNDERSTANDING OF MATHEMATICS

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There are some things in analysis – that is, mathematical analysis – that are extremely valuable for sharp scientific theories. I have striven for more than a decade to understand what they are. Then there are many other things in mathematics that are not as valuable. There are an infinitely many diverse points of view that one could adopt towards the use of mathematical models for the purpose of scientific theories. But not all of them are of equal validity. The fundamental question is of course the issue of *what about Nature follows any mathematical models exactly.*

In order to understand this issue, we must firm clarity that Nature was not contrived by human beings. We, human beings, the subjects of existence in Nature, are not the creators of Nature. We, human beings, we contrive scientific theories about an external Nature that we did not design.

The Scientific enterprise is an enormously optimistic enterprise where we have faith that *although we did not design Nature and we have no authority that tells us the laws governing Nature, nevertheless, with various methods, we will be able to model Nature accurately enough to be able to describe Nature.* It is an extremely ambitious enterprise, to be sure.

There is, at least to my mind, no apriori reason why we ought to have (a) any success, (b) a tiny amount of success, (c) moderate amounts of success, and (d) extremely strong success in this extremely ambitious enterprise.

It is most fascinating to me that some of our mathematical models do have some successes. Indeed many of our theories of Nature from even before the 1660s and Isaac Newton's works have led to variable levels of success and also left many questions for the future.

Thus I consider the issue of of deciphering what sort of thing within mathematics leads to some successes important for our fuller grasp of what is substantial part of mathematics that allows us to understand Nature at all.

For example, I claim that the universe is geometrically (spatially) a four-sphere and the spinor fields on the four-sphere of a fixed and measurable radius $R = 3075.69$ Mpc provide us with a full model of Nature that quantitatively along with a simple law that governs dynamics in time.

The question is whether there is a naturality to these mathematical objects that have any perfect match to nature's actual and mysterious laws that are not *contrived creations of human minds* for our own entertainment our our satisfaction but existed long before the first homo sapien evolved in East Africa some 7-8 million years ago. It is important for the readers to appreciate the nature of my thought here: Nature is mysterious and so there is no guarantee anywhere of any absolutely correct answer. Every model of nature might be simply a delusional scientific theory, whose validity might be refuted with some finer and deeper understanding. I am religious, although I am not a follower of Islam, Christianity and other popular

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religions. But on this matter of certainty, I am extremely clear that the main issue is that religious texts are not giving us solace, and there is not trustworthy oracle, and we are left to fend for our own understanding collectively without any divine oracle, and so we are constantly trying to find ways to test our resolve by measurements and defending new convictions and this pull and tug will be part of Science for the next ten thousand years.

Every age will have its strong faith that another age will challenge. I am challenging today Einstein's Relativity and Schroedinger's Quantum Mechanics and Lemaitre's Expansionary Cosmology, and I believe this is the Final Theory of Nature. In some centuries finer understanding will lead to various theories that will see more refined answers over the four-sphere theory as fundamental physics. This is part of human intellectual evolution.

1. The Rearview Mirror

When we scan over the history of Analysis, we see gradual care for foundations, from rationals to the real line, the geometric descriptions of spheres and with it the evolution of function theory. To put things in a timeline, some major events would be 1660s the invention of calculus of Isaac Newton and Gottfried Wilhelm Leibniz, and the first partial differential equation roughly a century later in 1740s by Jean Le Rond d'Alembert, then its further development to the great declaration of Jean-Baptiste Joseph Fourier that all functions on a circle could be expressed in countable sums of trigonometric functions e^{inx} in 1811, then first Bernhard Bolzano 1819 then Augustin Louis Cauchy's 1823 work making precise the notions of limits and continuity, then Riemann's weakening of assumptions of integral of Cauchy in 1854, the first series expansion for S^n by Mehler in 1866, then Lebesgue's revolution removing technical problems 1902-1905 for integration theory with sharper understanding of measure.

After this there was Dirac's famous matrix square root in 1920s that led later in works of Michael Atiyah, Raoul Bott, and Arnold Shapiro in 1963 to introduce fine study of the Clifford modules and introduce Atiyah-Singer-Dirac operator for Riemannian Spin Manifolds.

Four-Sphere Theory is developed from these foundations and is a natural development of mathematical tradition in Analysis and Geometry. Spinor fields on a four-sphere were well established already when I graduated from Princeton in 1995, and indeed it was Professor John Morgan who was kind and asked me to master the book *Spin Geometry* by Harvey Lawson and Marie-Louise Michelsohn in 1995. I was at the time insufficiently able to have *perspective* on what is important and what is not. But my geometric intuition was very sharp in 2008 when I examined fundamental physics and I was quickly convinced that the energy quantisation *in Nature* was just Dirac spectrum on a scaled four-sphere, and that is Planck's Law really,

$$E = h\nu$$

This h had to be the *inverse of the radius of absolute space.* And so I began a long journey to elucidate the mysteries of Nature.

2. What Are Laws Of Nature?

I was reading Bas C. Van Fraasen's *Laws and Symmetry* and he began a wonderful essay "What Are Laws Of Nature?" with the observation that philosophers talk

about universality and necessity when speaking of laws, and scientists of symmetry, transformations, and invariance. I am far more 'classical' in my orientation than those steeped in the current paradigm of quantum field theory, general relativity and expansionary cosmology. I will be writing more about this, so I will call this entire package the **1900-1930 Scientific Paradigm**. It is valuable to do so finally since I represent a *different paradigm of Science*. I have worked on *fundamental physics and am a Scientific Revolutionary*. So the Scientific Paradigm I advocate is different from the **1900-1930 Scientific Paradigm**. My work, the four-sphere theory is a new paradigm of Science and is not the same and not reducible or equivalent to the **1900-1930 Scientific Paradigm**. I claim the differences are serious and that my paradigm is correct and the 1900-1930 Scientific Paradigm is wrong.