

RUMINATIONS ON FOUNDATIONAL ISSUES OF PROBABILITY THEORY

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1. THE ACTUAL UNIVERSE IS DETERMINISTIC

This Age is not clear enough about fundamental macroscopic physics, i.e. physics above the range of $10^{-13}cm$. The universe is totally deterministic. However, there is a giant surprise from the past three centuries. There is a vast purely electromagnetic *fourth* spatial dimension in the universe that is objectively real and not only a mathematical artifact. This is the great surprise and the source of great mysteries.

A single long-range deterministic law governs the actual universe, which is my S4 Electromagnetic law. This is a wave equation on spinor fields on a static eternal four-sphere of radius $R = 3075.69$ Mpc. So these are the things that underlie all physical law in Nature.

2. THE PURPOSE OF SCIENTIFIC MODELS

My S4 Physics Notes gives details including measurements and computations to justify Four-Sphere Theory. The key point for the current note is that the universe is a purely deterministic system with main law S4 Electromagnetism. All things of Heaven and Earth follow S4 Electromagnetic Law. The Universe is Compact, and Eternally Recurring.

In this context we are doing Science. In this context, we are attempting to elucidate precise mathematical models of Nature, and we are then examining our models by comparing scientific or mathematical models, which exist in our imagination, to measurements, in order to gain confidence in or reject certain theories of natural phenomena.

Let me make clear that understanding nature and her laws precisely is the *only serious business* for mathematics. I know that there are mathematical philosophies that pretend that there is something else that is more important. These are sad sorry misguided positions. They arise from immaturity and a lack of seriousness regarding the enterprise of Man's Search for Meaning and Purpose and sense.

3. NATURE IS ONE AND INDIVISIBLE

Here is Nature. I ignore high energy physics because I have conviction that high energy phenomena are not important to Nature as in almost all phenomena of human interests.

Nature is a metric four-sphere. There is a four-sphere $M_4 = S^4(R)$. It is described in the ordinary way,

$$S^4(R) = \{x \in \mathbf{R}^5 : |x| \leq R\}$$

That is the geometry of Nature. There are absolute coordinates here, however one wishes to put the coordinates, and then there is absolute time. Einstein was wrong and there is no unified spacetime. Time is time and space is space. So the universe is $M_4 \times \mathbf{R}$. All things of Heaven and Earth are in M_4 at any given moment. There is nothing that has objective existence than is not contained in M_4 . The *physical universe* is an evolving hypersurface $M_3(t) \subset M_4$, and time is linear, going back to minus infinity and going forward to plus infinity.

Things in Nature are *charged particles*, they have two magnetic poles when they are in $M_3(t)$ and they might be magnetic monopoles in $M_4 - M_3(t)$, and this is a matter of conjecture still for me. There might be entire worlds in $M_4 - M_3(t)$ and living in $M_3(t)$ our abilities to see and perceive into $M_4 - M_3(t)$ will be a matter for the future. All of Science between 1641-2008 before I discovered the Absolute Truth regarding Nature concerned itself only with $M_3(t)$ and was confused and senseless. It was I, Zulfiqar Moinuddin Ahmed, who brought clarity to what Nature is exactly for my Beloved People, the Human Race. It was I who had challenged the folly of deformation of time and space that had confused my people for a century. It was I who had chanted "Corruption of Time is a Capital Crime" harkening back to the time of Chronos the Titan madly in San Francisco with a wild look in my eyes roaming the streets without paying attention to the curious gawkers in 2012-2014.

4. ZULF WILL NOT TAKE RESPONSIBILITY IF THE DEMON SOUL BILL GATES IS VAPORISED INTO NOTHINGNESS

Now the Human Race is a young Angelic Race, and I am an Archangel Soul, so I am completely against these Demon Souls existing to cause harm to the Human Race. Ideally, it ought to be the United States of America that should destroy Bill Gates and dispossess him of all property, but I will certainly neither mind nor take responsibility if some Noble Soul decided to Vaporise Bill Gates where he stands and evaporate his blood into cosmic gas particles. He does not belong on Earth at all. He is Evil, and he intends harm to Human Race.

5. ZULF DOES NOT LIKE 'EVENT ORIENTED' INTERPRETATION OF PROBABILITY THEORY

You see, Nature is quite clear in my description. Now probability theory arose originally from letters between Pierre Fermat and Blaise Pascal regarding gambling games. This has led to the formalisation of the type where Ω is a measure space with sigma algebra \mathcal{F} of subsets of Ω and a probability measure P that provides $0 \leq P(A) \leq 1$ for $A \in \mathcal{F}$. The terminology is that A are "events" whose probabilities are $P(A)$. I don't like this at all. I hate considering A as 'events'. Then I get completely confused because it's not clear and geometric enough for me. I think the whole frequentist theory of foundational interpretation of probability theory is inappropriate.

Instead, I would like to consider the issue that to the extent that Probability Theory will have something to tell us about Nature, all probabilistic models will have to be embedded in $M_4 \times \mathbf{R}$. We want a canonical philosophical underpinning of how to formalise this.

6. THE SERIOUS TASK OF STATISTICAL THEORY

The most serious purpose of statistical foundational theory is to tell us whether various complicated scientific theories are:

- True about actual Nature
- Not true about actual Nature

That is the fundamental and only purpose for the existence of the discipline. Scientists have the penchant for believing that even their most delusional theories that involve stays at the Dark Side of the Moon in between infrequent measurements of various things are obviously right. No Scientist comes up with theories that would make various people with those aluminum foil hats cringe with the feeling of absurdity ever think that their theory can be possibly wrong with only several hundred fudge factors to smooth over problems. I know, because I do Science. I cannot even believe that my theories can be possibly wrong even *without any fudge factors*. We're Scientists; we're arrogant like that. It won't change.

So the Statistical Theory has to be able to *handle* this volume of people who are quite clearly not crackpots, such as myself because we quickly don a white suit whenever people are looking and seem objective, reasonable, serious, and speak in serious low monotonous voice. Fine, I don't like doing that, but I know the tricks, ok?

7. LESSON FROM MY DISCOVERIES

Many years ago, around 1995-1997 I was a graduate student at Columbia University. At the time, I was amused by the idea in some humanities disciplines concerned about 'scientism' that it is possible that even gravity is socially constructed. Like many people with background in mathematics I felt the idea was absurd. Some decades later, I had reproduced Earth-Sun gravity using Van der Waals forces, and proved that indeed gravity was always socially constructed after all. This lesson, that scientific theories can be vastly misleading and still hold sway for centuries is a warning sign, for vigilance in science. I have here Imre Lakatos' *The Methodology of Scientific Research Programmes*. I love Imre Lakatos as well as his good friend Paul K. Feyerabend and their works had always been influential on my thinking.

What has changed now with Four-Sphere Theory is that we do have a coherent total physics theory that is correct, and this allows us an opportunity to reformulate issues of measurement and precision anew for whether theories are matching Nature or whether they are failing. This problem is now possible to understand because of Four-Sphere Theory being true, because we can ask about the nature of Noise in Nature, the nature of Scientific Inference in this context, where we are not floating in the nebulous world but can ask for precision of matching measurements with truth. In other words, if we cook up a scientific theory based on concepts invented by ourselves, when do we conclude that our theories are true about nature?

I remind my dear reader that Nature, the external world has no obligation to respect any of our invented stories at all. She could foil all the various clever schemes of Mice and Men. Therefore Scientific Inference is an extremely ambitious issue, and cannot be reduced in any sense to arbitrary procedures.