

# SPIRITON

## The Fundamental Particle of Life

- ▶ FINE-TUNING ..... 1
- ▶ THE MARVELS OF LIFE .....2
- ▶ EXCERPT OF CONVERSATION BETWEEN DR T.D. SINGH AND PROF MICHAEL J. BEHE ..... 3

A monthly newsletter on Science and Spirituality

Vol. 03/Aug 2014



**F**ine-tuning generally indicates the active process of making adjustments in order to obtain optimum performance. Such processes are natural for us and its symptoms can be observed within its outcome. When listening to an orchestra of musicians, the synchronous melodies we hear don't occur by chance; rather, we know that amongst many other processes, fine-tuning had occurred on many levels - from the individual instruments to the performers and the conductor and even the sound system used in the room - all contribute to relishing the music. Similarly, in every human endeavour, or rather in every endeavour of beings with some form of intelligence, symptoms of fine-tuning can be observed. On a grander scale of things, it has been observed and studied that many aspects of the Universe we live in are fine tuned.

Our laws of physics, gravitation, the speed of light, the charge of the electron and other fundamental constants, the density of water at different temperatures, etc are all fine-tuned such that the planet we live in would function and support life as we know it. Wouldn't this naturally lead to the inference that our Universe has a creator?

There is now a general consensus within the scientific community that the fundamental physical laws of this universe are fine-tuned for life or for the maintenance of life<sup>i</sup>. These constants are so precise that even the slightest deviation would cause the entire environment to be too cacophonous to support life. While the presence of this fundamental orderliness resonate the presence of an orderly designer, some scientists argue that the orderliness is an occurrence of chance and it is this 'string of innumerable chances' which bring about the present biodiversity we see. Some scientists, such as Stephen Hawkins and others, claim that it is these laws of nature that govern the universe and as such there is no necessity of a creator. In his book *The Grand Design*<sup>ii</sup>, with Leonard Mlodinow, he states, "Because there is a law such as gravity, the universe can and will create itself from nothing.

Spontaneous creation is the reason there is something rather than nothing, why the universe exists, why we exist. It is not necessary to invoke God to light the blue touch paper and set the universe going."

As respected as Stephen Hawkins is, this idea does not seem very logical. It would be akin to saying that as the jet engine is running and operating according to the laws of physics, it thus would not need an inventor or an operator.

*Continued on page 2 ...*

### Quote

**"... how one got to the first living cell is so utterly unknown. Anyone is free to speculate about what would have happened. One should recognize that one's ideas are speculations. At least they are not justified by physical evidence at this point"."**



*by Dr. Michael J. Behe*

*".. the Vedantic paradigm proclaims that this complete cosmos is a manifestation of the Supreme Person who set the laws of physics into motion, and who has a divine plan for every individual."*

... Continue from page 1

While it is true that it is running based on the laws of physics, it is also true that it was an invention by Sir Frank Whittle, who properly understood and utilized the laws of physics. In line with this reason, the Vedantic paradigm proclaims that this complete cosmos is a manifestation of the Supreme Person who set the laws of physics into motion, and who has a divine plan for every individual.

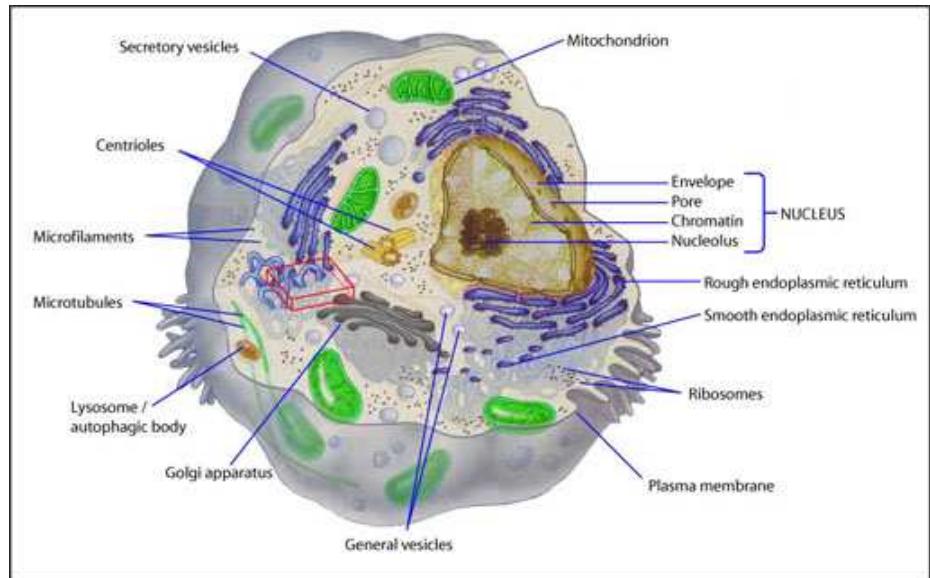
This issue attempts to understand the concept of fine-tuning from different perspectives. It also includes a cartoon, which make its debut in this August issue of SPIRITON. While it may seem simplistic, it conveys the message that fundamental physical constants are necessary for the sustenance of life.

By Dr. V. Krishnan-Kutty



## A Glimpse into The Marvels of Life

### Journey inside the cell

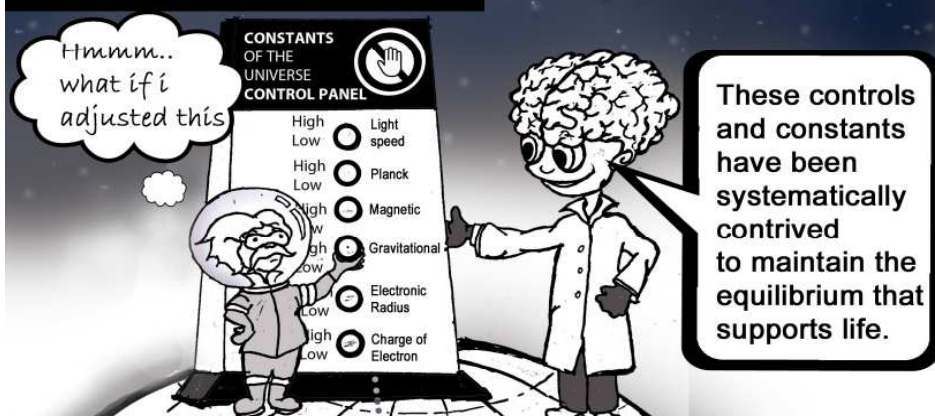


The human body acts as a finely tuned machine, a magnificent metropolis in which, as its inhabitants, each of the 75 trillion cells, composed of  $10^{27}$  atoms, moves in symbiotic precision. Going inside the body and then inside the cell is a journey to wonderland. If we could walk inside a cell, our first task would be to keep from getting bowled over. We would be faced with a myriad of microsized vessels moving in all directions. (Please note that in the above diagram, only representative organelles are shown. In an actual cell, most of these components are present in the thousands filling the interior space with activity). It has been estimated that there may be as many as 200 trillion molecules in a single cell, all executing thousands of coordinated reactions with precise timing and function. To get a scale for the rate of activity, consider this: On average, each cell in our body forms 2000 proteins at every second<sup>iii</sup>. We are so embedded in the biosphere that the marvel of its organization has become lost within its commonness.

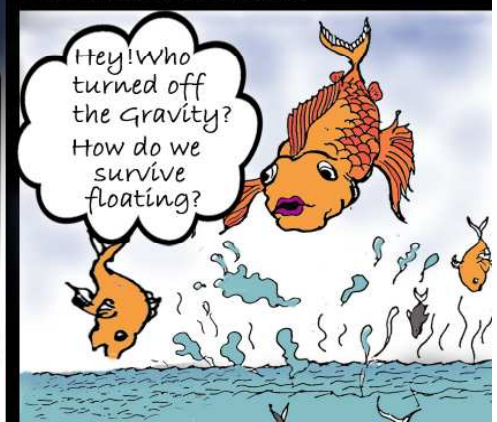
## SpiriTOONS

Drawn by: Ashok K.N

Outside the universe.....



Meanwhile on Earth.....





# Excerpt of a conversation between Dr. T. D. Singh (TDS) and Prof Michael J. Behe (MJB) at Lehigh University, Bethlehem, PA, USA. June 9, 2004

**TDS:** In a meeting I attended the day before yesterday there was one chemist who was from the University of Wisconsin. He was making a presentation about fine-tuning from a chemistry point of view. He gave two examples. One was the water molecule, and the other was carbon dioxide (CO<sub>2</sub>) molecule. The angle of H<sub>2</sub>O is 104.5 degrees and the other one is 180 degrees. He said that these angles are fine-tuned<sup>iv</sup> (Fig. 1).

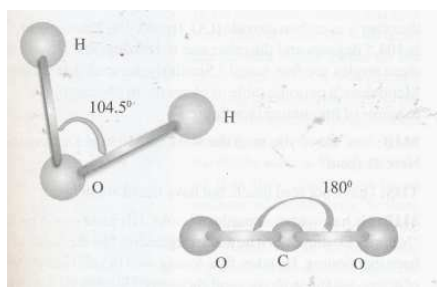


Figure 1: Fine-tuned angles of H<sub>2</sub>O and CO<sub>2</sub>. The unique angles of these molecules are central to their structural versatility. The shape and structure of a molecule is an important determinant of its function (for details ref iv at the end).

Similarly, he said that the entire Mendeleev's periodic table of elements in chemistry is also an example of fine-tuning (Fig. 2).

**MJB:** Yes. Have you read the work of Michael Denton, from New Zealand?

**TDS:** I have not read much, but have heard about him.

Figure 2: Periodic Table of the Elements – A beautiful sequence of elements where one finds elements in increasing atomic numbers horizontally and sharing common physical and chemical characteristics vertically.

**MJB:** He has written a couple of books. His most recent book is "Nature's Destiny".<sup>v</sup> In it, he makes arguments like the ones you've been mentioning. He takes fine-tuning well beyond just the laws of nature, yet still in physics and chemistry. He takes the arguments of fine-tuning to the properties of water, which have been much talked about— the ability of water to form ice, which is less dense than in liquid form. The strength of covalent bonds, the strength of hydrogen bonds, the particular properties of carbon, these things have all been talked about. Similarly, the properties of molybdenum necessary for nitrogenous enzymes to reduce gaseous diatomic nitrogen and fix it in the biosphere to be used by living cells. Apparently, molybdenum is the only element that can fit the bill. There are many examples like that. And so, I appreciate the understanding of chemical fine-tuning. Take for example, the DNA molecule. Nobody has ever been able to come up with other nucleotides which could do the same work as DNA — hydrogen bonding between hydrogen atoms and with oxygen and nitrogen atoms leading to different base pairs having the same geometry and size so that they could lead to an undistorted double helix (Fig 3). So there is a whole wealth of details like that. Again, I think the fine-tuning argument started, in at least the modern era, with the basic physical laws. For example, Brandon Carter's anthropic principle, and so on.

Continued on page 4...

## SEVEN NOBEL LAUREATES ON SCIENCE AND SPIRITUALITY

This book is a pioneering effort to bring together several Nobel Laureates in a single publication to discuss science and spirituality. It offers two dialogues and five essays by seven Nobel Laureates.

... .Continued from page 3

But the more we know, I think, the more we discover, and the more we think about it, the more and more details of the physical world, of chemistry and biology, we will see are fine-tuned, and some actually are purposely designed.

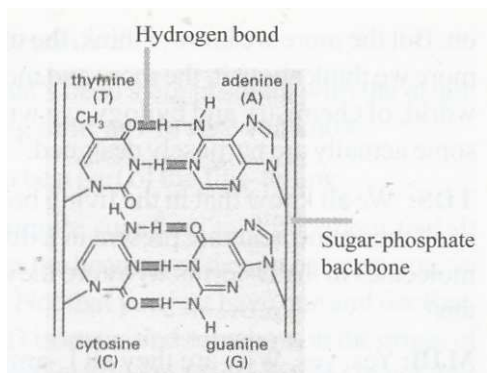


Figure 3: The four bases of DNA showing the hydrogen bonding between base

**TDS:** We all know that in the living bodies the stereochemistry of all the amino acids are present in L-forms and that of the sugar molecules in the D-forms. Why are they so? Did you think about this?

**MJB:** Yes, yes. Why are they all L-amino acids?

**TDS:** Is it part of the fine-tuning? (Fine-tuning of nature to have it conducive to life)

**MJB:** I don't know. I guess it's convenient to have them all one-handed, one

structure, than to have some D's and some L's.

**TDS:** But in nature the L and D forms occur exactly 50 percent. But why is one selectively utilized?

**MJB:** That's correct. That's been a big problem with the origin of life scenarios for a longtime, as I'm sure you know.

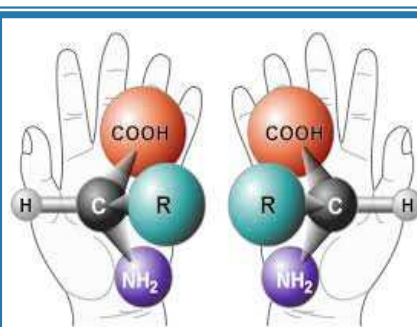
**TDS:** But this could also be a part of the fine-tuning.

**MJB:** Yes, yes. I'm not quite sure how to think about that. It might start to come under the heading of design because you've got the two possibilities. Not that you just have one and use that.

You've got the L and the D isomers, and somehow, in the origin of life, only the Ls had to get together to form proteins in the first cell. And whether that could occur by some physical process, even a fine-tuned physical process, is open to question. It suggests that somebody kind of picked them out and put them together. At least to me it suggests that there was a finely tuned process that allowed that to occur. But that's open for discussion, I think.

Taken from:

*vi* God, Intelligent Design and Fine-Tuning -- A Dialogue between T. D. Singh and Michael J. Behe



Carbon atom produces a tetrahedral structure with a geometric symmetry. When four different atoms or groups of atoms are bonded to the four corners of such a tetrahedral structure, two different spatial configurations are possible. Although both forms have the same structural formula they cannot be super imposed, but are in fact, mirror images of each other. Two stereo isomers are possible for each carbon atom. Stereo isomers, like left and right

hands, are mirror images of each other and cannot be superimposed on one another. Three carbon amino acid alanine has a single asymmetric carbon atom in the center and thus has two stereo isomers called L-alanine and D-alanine. Both stereo isomers of alanine occur in nature but only L-alanine is present as a component of proteins. Similarly, the backbone of RNA and DNA molecules contain only right-handed sugars.

## References and Further Readings

<sup>i</sup> PCW Davies (2003). "How bio-friendly is the universe". *Int.J.Astrobiol* 2 (115): 115.

<sup>ii</sup> Stephen Hawking and Leonard Mlodinow. *The Grand Design*. New York: Bantam, 2010.

<sup>iii</sup> Gerald L. Schroeder. *The Hidden Face of God: Science Reveals the Ultimate Truth*. New York: Touchstone, 2001, p. 62.

<sup>iv</sup> Michael Denton. *Nature's Destiny: How the Laws of Biology Reveal Purpose in the Universe*. New York: Free Press, 1998, pp. 22-46 & pp. 131-137.

<sup>v</sup> Michael Denton. *Nature's Destiny: How the Laws of Biology Reveal Purpose in the Universe*. New York: Free Press, 1998

<sup>vi</sup> T D Singh. *God, Intelligent Design and Fine-Tuning -- A Dialogue between T. D. Singh and Michael J. Behe*. Kolkata: Bhaktivedanta Institute, 2005

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