

## Letters to the Editor

**Editor's Introduction:** With this issue the Journal of Space Philosophy initiates "Letters-to-the-Editor." Readers or Authors may submit letters to [BobKrone@aol.com](mailto:BobKrone@aol.com). Letters can comment on past Journal articles or be thoughts related to philosophy for the Future for humans in Space. Publication decision lies with the Editors of the Journal. When published, letters will not be edited, but submitted letters may be returned to authors for edit consideration before publishing.

In this Spring 2013 issue there are two important letters:

1. **From Dr. Joel Isaacson.** His letter provides results of discussion within the Cybercom Community of scientists on his "*Nature's Cosmic Intelligence*" article, published as the feature article in the Fall 2012 Journal of Space Philosophy, which describes his life's discovery and research into Recursive Distinctioning (RD). His discoveries have given the world of science INTELLIGENCE as the third major autonomous phenomena existing in the universe with ENERGY and MATTER.
2. **From Dr. Phil Harris.** Dr. Harris, one of the planet's most productive professional management and Space authors, having published 53 books, provides his letter to President Barack Obama, urging his Administration in his second term of office to focus on the resources of Space to solve United States and global problems.

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Dear Editor,

In the first issue of JSP, I introduced the notion of recursive distinctioning (RD) and wove it into nature's cosmic intelligence. During the weeks since, a number of new connections have arisen which link RD to quantum computing emulation within tiny structures inside neurons in the brain. The following summarize these developments.

The story starts about 75 years ago in some unlikely places and times.

The Majorana fermion (MF) is an elusive particle that was predicted in 1937 by Ettore Majorana, an Italian mathematician and theoretical physicist. It was pure mathematical speculation, based on the theoretical work of Paul Dirac.

The MF is the only elementary fermion that is its own antiparticle. This leads to exotic properties in that two interacting MFs may yield either a single MF or cause mutual annihilation. Logically, two distinct outcomes are possible, with 50% chance for either outcome. In quantum domains, things of this nature are quite common, for example, see Schrödinger's cat.

The MF particle was on the back burner for a long time, until people realized recently that it might be useful in quantum computation.

Early last year a group of Dutch experimental physicists announced detection of MF.

If we focus on the simplest RD, i.e., RD that operates on a single element (call it RD[1]), we discover that RD[1] always transforms a “thing” into itself in such a way that the thing is in one of two possible implied states. This is logically similar to having an UP or DOWN spin, in alternation. Thus RD[1] operates like an oscillator, or an elementary clock, and mimics MF.

Where can RD[1] be realized? This takes us into a fantastic journey within neurons in the brain, inside the domain of microtubules. What are microtubules?

Microtubules are parts of the cytoskeleton of the cytoplasm of all eukaryotic cells, including neurons. They are far more numerous than neurons and if these can do certain computations then the overall capacity of the brain to compute would be far greater than with neurons alone. Why do we think that microtubules can compute?

Microtubules have a very regular structure. The basic components are tubulins, which are two protein dimers, alpha-tubulin and beta-tubulin. The tubulins are arranged in a 2-D lattice that is wrapped into a tubular structure. About 30 years ago, Stuart Hameroff and others suggested that microtubules can do cellular automata computations. If so, they could do RD too.

Subsequently, Stuart Hameroff and Roger Penrose argued that microtubules can do quantum computing but they ran into great difficulty with that concept, partly because of decoherence effects.

Our concept is that microtubules can do emulation of quantum computing, via classical computation, that is based on RD processes, which in turn are based on CA.

The number of microtubules (within neurons) is fantastic and their sizes are at nano-scales. So, this emulation may be a very efficient computation, even if slower than direct quantum computing. Interestingly, in this architecture, the microtubules become the computing elements (zillions of concurrent CPUs), while neurons assume the I/O functionality.

The computational resources in microtubules, compared to neurons alone, are staggering. In synaptic switching, the numbers come out this way. Roughly  $10^{11}$  neurons in the human brain, with  $10^3$  synapses per neuron. Speed of switching is measured to be about one millisecond, thus about  $10^3$  operations per second, or approximately  $10^{17}$  bit states per second.

For microtubules automata, the scales are quite different and the computing power is staggering. These are the numbers. A single neuron contains  $10^7$  tubulins (which are the active switching elements in microtubules automata). Speed of switching is one nanosecond, so that the estimate is  $10^{16}$  operations per second per single neuron. For a

brain containing  $10^{11}$  neurons, the total computing capacity (via microtubules automata) is  $10^{27}$  operations per second, compared to  $10^{17}$  for neuronal/synaptic alone. They differ by a factor of  $10^{10}$ !!!

There is considerable activity in emulation of quantum automata, using a variety of techniques, including hardware, software, and firmware. Some of these emulate quantum superposition and even entanglement.

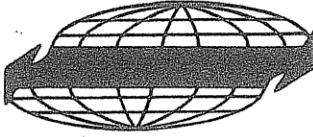
There is also literature discussing “microtubules automata,” and of course discussion of the Penrose/Hameroff quantum computing within microtubules.

The possibility of CA in microtubules (as classical computation) meets very little resistance, if any. I adopt this notion and propose to look for RD in microtubules. RD[1], if confirmed in microtubules, would establish MF-like events therein and would be the first step toward quantum computing-like events in microtubules.

RD theory is gaining credence and its relevance to Nature’s cosmic intelligence is being enhanced.

Joel D. Isaacson, PhD

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MANAGEMENT OF CHANGE

**HARRIS INTERNATIONAL**  
CONSULTANTS TO MANAGEMENT ON ORGANIZATION & HUMAN RESOURCE DEVELOPMENT

January 22, 2013

**PHILIP R. HARRIS, Ph.D**  
PRESIDENT  
MANAGEMENT / SPACE  
PSYCHOLOGIST / AUTHOR

President and Mrs. Barack Obama  
THE WHITE HOUSE, Washington, DC 20500

Dear Barak and Michelle:

Today I celebrate my 87<sup>th</sup> birthday in the glow of your re-election and second inaugural. Your superb inaugural address yesterday was another example of your *audacity of hope!* May you gain the skill of synergistic relations to convince Republicans in Congress to enact your ambitious agenda. The goals you set forth for climate change, gun control, immigration reform, and economic recovery are indeed admirable. If you manage to get such reforms passed into legislation, then you are likely to achieve my prediction of your becoming one of our greatest American presidents, on a par with Washington and Lincoln.

However, there was one omission in your renewal plans for our beloved country. Thus, I hope one of your aides will ensure that you read this missive. The goal that you fail to address is the utilization of space resources which could remove poverty on this planet and provide new jobs. Originally, I brought this critical issue to your attention in my letter of July 4, 2008 while expressing support for your first campaign. Subsequently, I sent a copy of my book, *Space Enterprise*, to your wife on October 8, 2008, so that she would encourage you to read its message. However, in your first term, the vision you expressed for space development was befuddled.

Before you finish your second term, perhaps you will consider issuing an executive order to your NASA administrator that will utilize lunar resources on behalf of humanity! The American taxpayers deserve an ROI on their considerable investment in the Apollo missions to the Moon. The new space industry of communication satellites is only the beginning in that regard. Your General Bolden and Secretary of State Kerry require your instructions to forge new international agreements on commercial lunar development with China, India, and out national partners in ISS. Together this global community needs to establish a memorial of our going offworld – an Apollo Lunar Industrial Park on the Moon by year 2025 ! To achieve that objective, I recommend four exceptional consultants for help with such a macroproject – Dr. David Schrunk (EM=docscilaw@aol.com); Dr. George Robinson (EM: astrolaw@aol.com); Steve Durst (EM=info@iloa.org); and Derek Webber (DWspace@aol.com). World space advocates have great hopes for your second term accomplishments beyond Earth!

Pax,

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