

Searching for the Universal Matrix in Metaphysics

Research News and Opportunities in Science and Theology 2, No. 8, p. 22
Templeton Foundation Press, April 2002

H. E. Puthoff, Ph.D.
Institute for Advanced Studies at Austin
Austin, Texas 78759

Throughout mankind's cultural history there has existed the metaphysical concept that man and cosmos are interconnected by a ubiquitous, all-pervasive sea of energy that undergirds, and is manifest in, all phenomena. This pre-scientific concept of a cosmic energy goes by many names in many traditions, such as ch'i, ki or qi (Taoism), prana (yoga), mana (Kahuna), barakah (Sufi), élan vital (Bergsonian metaphysics), and so forth.

Complementary to the above metaphysical concept, contemporary physics similarly posits an all-pervasive energetic field called quantum vacuum energy, or zero-point energy, a random, ambient fluctuating energy that exists even in so-called empty space. (The adjective *zero-point* means that such energy or activity exists even at a temperature of absolute zero where no thermal agitation effects remain.) Thus, even in the absence of matter, in the modern view empty space or vacuum is never truly particle or field free, but rather is the seat of continuous virtual particle-pair creation and annihilation processes, as well as so-called zero-point fluctuations of such fields as the electromagnetic field. Originally thought to be of significance only for such esoteric concerns as small corrections in atomic emission processes (e.g., the Lamb shift), it is now understood that vacuum fluctuation effects play a central role in large-scale phenomena of interest to technologists as well, such as the enhancement or inhibition of the spontaneous emission of light in atomic processes, the generation of short-range attractive forces between closely-spaced materials, and the possibility of extracting useful energy from vacuum fluctuations, the "Holy Grail" of energy research.

Should we further consider the possibility that such random vacuum energy might be subject to influence by consciousness or intention, then, given that it is well understood by physicists that a restructuring or "cohering" of vacuum energy would have physical consequences for matter, animate or inanimate, such could provide a rational basis for healing or other processes that are part and parcel of the pre-scientific view. In such fashion the similarities, differences and possible synthesis of the pre-scientific and modern concepts of an all-pervasive energy field can be considered.

As a physicist specializing in fundamental quantum physics and yet interested in these issues, I have an abiding interest in "pushing the envelope" with regard to the present scientific paradigm. This includes the issue as to whether what we know of the life process itself can find

rapprochement with modern quantum physics, or whether and how it needs to be extended. Given my own earlier decade-plus background as Director of the Cognitive Sciences program at SRI Intern'l in the '70's and early '80's, investigating remote viewing and other so-called "paranormal" phenomena, the life-science data I have to integrate all by themselves push the envelope (Proc. IEEE **64**, 329 (1976); Jour. Sci. Exploration **10**, 63 (1996)).

Unfortunately, as it now stands, mainstream physics reductionism is leading to an evermore complex picture of nature involving a proliferation of particles, the possibility of yet more "fundamental" forces, the implications of incorporating additional dimensions as in superstring theory, and so forth. Thus, in spite of efforts to develop a grand unified theory to simplify our picture of nature, the actual day-to-day work on this effort is complexifying faster than the hoped-for simplification. Therefore, not only are we missing holism on the grand scale, but a gratifying holism just for the physical sciences alone appears to be a rapidly accelerating goal post.

Contemplation of such provocative issues in both the physical and life sciences led me into investigating an area of physics concerned with what is known as quantum vacuum fluctuations or zero-point energy, a universal background energy pervading all of space and associated with fluctuations of underlying space itself. Specifically, I began to consider the underlying quantum fluctuations as a fundamental "stuff" out of which a greater synthesis could be built. I hasten to add that I do not mean for such an approach to be simply reductionism on a grander scale, with no room for "nonphysical" factors to play a role. Rather, to the degree that "energy" is involved not only in physical but in nominally non- or para-physical phenomena (including, perhaps, such "mundane" phenomena as thought, charisma, etc., let alone psychokinesis), then such energy patterns might in principle emerge as a result of cohering or patterning the otherwise random, ambient zero-point energy. For me this hypothesis emerged when I considered how uneconomical Nature would have to be to posit, on the one hand, an all-pervading energetic field of ki or chi, as in the metaphysics of the martial arts and acupuncture, and, on the other hand, also posit an all-pervasive energetic field of quantum zero-point energy. It appeared to me to be more likely that we were dealing with a single underlying substructure which goes by various names in various cosmologies, depending on whether it is in its pre-manifest random form, or patterned at various hierarchical levels, including the "purely material."

In my professional area, I began with the pure physics side. In my first published study on the significance of zero-point energy for broad issues I showed that the basic stable states of matter are not merely inert, static structures, but rather depend on the presence of the underlying, sustaining zero-point energy which is continually being absorbed and re-emitted on a dynamic-balance basis. Pull the plug on the zero-point energy and all atomic structure would collapse (Physical Review D **35**, p. 3266, 1987).

In my second study I developed the idea, originally put forward as a hypothesis by the famous Russian physicist and human-rights advocate, Sakharov, that the gravity of Einstein's equations is not a separate, fundamental force, but rather is a pressure force derived from partial shielding of the ambient zero-point energy (Phys. Rev. A **39**, p. 2333, 1989; **47**, 3454, 1993). (A corollary to this view is that if one could cohere the otherwise random fluctuations of space, a host of interesting phenomena would follow.)

In my third study (Phys. Rev. A **40**, p. 4857, 1989; **44**, pp. 3382 & 3385, 1991) I showed that on the cosmological scale a grand hand-in-glove dynamic equilibrium exists between the ever-agitated motion of matter on the quantum level and the surrounding zero-point energy field. One consequence of this is that we are literally, physically, "in touch" with the rest of the cosmos as we share with remote parts of the universe fluctuating zero-point-energy fields of even cosmological dimensions. Who is to say whether, for example, modulation of such fields might not carry meaningful information as in the popular concept of "the Force?"

In a fourth study with colleagues from Lockheed, CIPA and Cal. State at Long Beach (Phys. Rev. A **49**, 678,1994; The Sciences **34**, 26, Nov/Dec 1994; Science **263**, 612, 1994; Spec. in Sci. and Tech. **20**, 99, 1997), we have shown that the simple property of inertia possessed by all bodies is simply resistance to being accelerated through the zero-point fluctuations, an extremely fundamental result in physics that provides an underpinning for Newton's Law of inertia.

In a fifth study (Spec. in Sci. and Tech. **13**, 247, 1990; Phys. Rev. E **48**, 1562, 1993) I examined the evidence that not only is zero-point energy at the base of a number of fundamental physical phenomena, but that in principle non-polluting energy can be extracted from the fluctuations so as to constitute a new energy source; a concept for which my research group has attracted seed funding, obtained encouraging laboratory evidence, applied for and obtained patents worldwide, and which is the focus of a present in-house program.

Finally, in a sixth study (Phys. Essays **9**, 156, 1996; Ad Astra **9**, 42, 1997; Jour. Sci. Exploration **12**, 295, 1998) I indicate how manipulation of the underlying zero-point-energy spacetime metric opens up the possibility for efficient interstellar propulsion, a concept well-received both in popular writings (e.g., Arthur C. Clarke) and by the mainstream (Air Force, NASA laboratories).

All of this characterizes the underlying, ambient, random quantum zero-point-energy sea as a blank matrix upon which coherent patterns can be written, such information constituting at the bottom end of the scale coherent particle and field structures, and, to a zero-point-energy chauvinist like myself, an ascending ladder of possible other information structures, whether it be coherent electromagnetic field structures around living organisms, possibly non-biochemical components of memory, or other more esoteric aspects of Nature. If my goal for this research comes to full fruition, what would emerge would be an increased understanding that all of us are immersed, both as living and physical beings, in an overall interpenetrating and interdependent field in ecological balance with the cosmos as a whole, and that even the boundary lines between the physical and "metaphysical" would dissolve into a unitary viewpoint of the universe as a fluid, changing, energetic/information cosmological unity.