A HIERARCHY OF CREATIVITY

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1) Multiverse ---> creating universes

The multiverse is the primary source (First Cause) of creative energy, and of all possible universes. Some of these universes, like our own, will be created with life-friendly physical constants. All universes must contain zero net energy and zero net charge (at least initially), and must be able to conserve what energy and charge they may otherwise contain (subsequent to their formation). Hence the creative energy of the multiverse is never exhausted. The multiverse is the source of the universal physical constants, such as the value of velocity "c", the gravitational constant G, Planck's constant of energy "h", and other primary ("given") constants which cannot be derived.

2) Our Universe ---> creating spacetime, particles (leptons, neutrinos, baryons, and leptoquarks), and the four forces (electric, strong, weak, gravity)

Our universe is an electromagnetic universe whose positive energy is balanced by the negative energy of gravity. The electromagnetic constant "c" is a symmetry gauge (banishing time and distance), hence regulating the symmetric dimensional energy state of free electromagnetic energy, or light. Our universe creates spacetime, the four forces of physics, and elementary particles (during its birth in the "big bang"). Our universe is asymmetric, in that it contains a surplus of matter over antimatter. This asymmetry is addressed by the conserved charges of matter, which function to (eventually) annihilate matter and return the universe to its primordial symmetric condition of pure light. All manifest universes must be asymmetric, and have some means of addressing their asymmetry in order to return to their original symmetric state. Symmetry, no less than energy, is a conserved property of our universe. *The charges of matter are the symmetry debts of light.* Gravity creates the galaxies of our universe. The "location" charge of gravity is one of the conserved charges of matter.

3) Galaxies ---> creating stars and planets

The galaxies collect (via gravity) huge concentrations of matter, from which are formed stars, planets, and other astronomical bodies (including black holes). The spherical shape of large bodies formed/bounded by gravity is distinctive. Small bodies of angular shape are bounded by molecular/crystalline (electromagnetic) forces. Galaxies are the primary "social" units of the cosmos, its "cities", where all the action occurs. Gravity carries forward simultaneously two agendas of our universe: 1) the universal thermodynamic agenda shared by all forces to convert matter to light, returning the cosmos to its original symmetric state (conservation of symmetry and energy); 2) the universal agenda of the information domain (also shared by all forces) to create life and the conscious self-awareness of the cosmos. Information enters the cosmos in the form of the charges of matter during the "big bang", serving to provide a roadmap back to the symmetric energy state of light for the asymmetric matter of the cosmos (the agenda of the thermodynamic domain - symmetry as well as energy conservation - see Noether's Theorem). However, during this very lengthy journey, this same information is available to create life and a conscious, self-aware universe (the agenda of the information domain). Gravity is a form of negative energy and entropy, converting space into time.

4) Stars ---> creating heavy elements

In stars (including supernovas), all four forces acting together (gravity, electric, weak, and strong) create the heavy elements of the Periodic Table. The elements are the building blocks ("bricks") of

information which the universe will use to pursue a unique and non-thermodynamic agenda in the information domain - the creation of life, consciousness, and a self-aware universe. The gravitational pathway from asymmetric matter to symmetric light also begins with stars, passes through supernovas, and ends with quasars and Hawking's "quantum radiance" of black holes. The gravitational pathway to information building also begins with stars but then passes to planets and chemical rather than nuclear interactions.

5) Planets ---> creating life
Planets afford a safe haven for life if conditions are right (similar to those on our own planet Earth). There must be billions of such planets in our cosmos - not only now, but in the past and future. The creation of life remains a mystery, but it apparently follows a General Systems 4x3 algorithm or information pathway. Planets like Earth allow the creativity inherent in atoms and molecules (as the attractive forces generated by their charges) to produce crystals and complex molecular combinations, culminating in organic molecules and finally RNA and DNA, molecules which can replicate themselves.

6) Life ---> creating humans
Once replicating molecules are formed (RNA/DNA), Darwinian evolution rapidly produces cellular life forms, and eventually complex organisms culminating in humans. Humans are the top of the "information ladder", at least in our local system. Considered in terms of information, humans are as big and as significant as any star.

7) Humans ---> creating science, technology, art, religion
Humans become a co-creator with the universe, inventing a new and powerful domain of abstract information (language, writing, art, science, math, etc.) which allows them to create a technology paralleling the natural world. Humans fly but not with wings, swim but not with fins, see but not with eyes, etc. The role of humans is to allow the universe to understand, experience, and appreciate itself, colonize the galaxy, and to protect our planet with its precious information content from destruction by enemies both foreign and domestic. Humans have gained their unique place in nature by exploiting a new domain of information - the abstract realm of language, math, and science, the realm of our abstracting intellect and imagination. If we regard Gaia ("Mother Earth") as a super-organism, then it may be supposed that humans have been purposely evolved by Gaia to disperse her seed (earth life) through the galaxy, and to protect herself from planet killing asteroids/comets - such as wiped out the dinosaurs - both objectives becoming a real possibility through our space programs.

Postscript: Language, Law, Religion
The phenomenal success of humans is due (in part) to their abstracting and imaginative intelligence, curiosity, social behavior, clever hands, and language. DNA is the molecular, genetic language of biology; between DNA and Natural Selection, nature has populated the oceans and land with myriad forms of DNA-programmed life. Humans have invented their own abstract, symbolic language (both spoken and written), which allows them, in concert with their tools and mathematics (another abstract, symbolic, quantitative form of language), to create a world of their own - in many respects parallel to the DNA world. In recent decades, we have invented computers and another abstract programming language belonging to them alone. We have passed from spoken language to machine language, and

from the DNA world created by nature to the machine world created by humanity. We may soon be able to program the assembling of amino acids into functional proteins and nucleic acids, imitating the natural process, possibly even creating a man-made living cell.

In addition, and importantly, humans have discovered Natural Law, and applied it for their own benefit. From the harnessing of animals, wind, and fire we have evolved to the harnessing of the forces of nature. We have almost completely domesticated the electromagnetic force and the weaker (terrestrial) aspects of gravity, and are now bringing the nuclear (weak and strong) forces under our control. We are even laying hands directly upon the DNA molecule and usurping the prerogative of Natural Selection. We have passed from selective breeding to genetic engineering. Our understanding of Natural Law, combined with our mathematics, language, computers, and tools/technology, has already enabled us to leave our own planet and may well send us to new homes deep in our galaxy in centuries to come.

When humans are confronted with the knowledge of death - of the absolute annihilation of the individual and personality - our intelligence and imagination demands and finds a means of escape. Religious notions of the spiritual realm, reincarnation, the immortal soul, heaven, salvation, life everlasting, etc., all offer a way around the specter of death and personal destruction. But is our fertile imagination fooling us? Or are religious concepts actually symbolic of some non-biological reality - the conservation laws and the information domain of physics, for example? Death is a concept that applies only to biology, so if we are immortal it must be through a non-biological aspect of ourselves - hence the "spiritual" domain of religion and the "soul. In physics we find conservation laws regarding charge (including the "identity" charge of the weak force) and information - and we are nothing if not a giant compilation of both. We have also discovered the immortality of historical/karmic effects as they propagate forever throughout an expanding universe, and we have intimations of an eternally creative Multiverse - a surrogate for a (natural) law-giving "God".

Love the universe and it will love you back. We are here because the universe wants us to be here; and as surely as we have arrived in this life without any effort of our own, the universe will continue to employ us for its own purposes. This is a living, immortal, eternal universe. We are all children of the universe, part of the cosmic information domain, and in the forefront of its effort to awaken, experience, and enrich itself. Toward a more perfect awakening the universe will forever evolve.