
ANTHONY PERATT'S LEAST ACTION PLASMA UNIVERSE

By Pierre Beaudry, 12/20/15

INTRODUCTION: LYN'S HIGHER HYPOTHESIS

Over the 1986 period, Lyn had attempted to get Plasma physicists to make breakthroughs with respect to Plato's higher hypothesis of correlating the domains of Macrophysics and Microphysics. Lyn identified such a higher hypothesis in an internal "Private and Confidential Document" stating:

"3. What Dr. Wells has done, belongs to the class of the most important contributions to advancement of physics fundamentals. For reasons indicated by Riemann in his "On The Hypotheses Which Underlie Geometry," improved insight into the general lawfulness of the universe centers upon correlating what appear to be anomalous phenomena occurring on the scale of the very large (i.e. astrophysics) with seemingly anomalous events in the very small (i.e., microphysics, or a scale slightly greater than that of microphysics proper). If a new discovery in physics resolves such apparent anomalies, where previously prevailing analyses cannot, the discovery affected is proven to be of a universal validity, and is thus usefully classed as a fundamental discovery." (Lyndon LaRouche, PRIVATE INFORMATION CONCERNING THE COMING REPORT ON "KEPLERIAN ORBITS" IN LOCAL PLASMA AND RELATED EVENTS, April 11, 1986.)

As it turned out, Dr. Wells was not able to make the appropriate breakthrough, but, during the same 1986 year, another American plasma scientist did: Anthony L. Peratt of the Los Alamos National Laboratory. What was Peratt's discovery? The answer can be found in discovering how you can and must replace the Newtonian gravitational system of solid, liquid, and gaseous states by an electromagnetic plasma system because the Newtonian system is fake science and the other is more respectful of the universe as a whole. As Peratt put it then: "Cosmic Plasma physics is at present in a state of revision which is so rapid that it is appropriate to speak of a change in paradigm." (Anthony L. Peratt, [*Evolution of the Plasma Universe: I, Double Radio Galaxies, Quasars, and Extragalactic Jets*](#), IEEE, 1986)

When you consider the least action pathway of a planetary orbit, you are not considering at all the silly Newtonian notion of "force" because the Galaxy is not using any form of force to obtain that result. The Galaxy is using, minimally, a triply-connected form of least action which is a "force-free" motion, the existence of which you can only truthfully discover in your own mind. However, least action doesn't mean easy going.

It is for that reason that when you consider the universe as a whole, you cannot simply look through the narrow band of the sense perception spectrum and be satisfied with that; you must force yourself and investigate the whole spectrum, otherwise, what you might consider a fixed but regular bleep signal appearing in your field of vision might be some new planet orbiting around you without your knowing it.

Therefore, the best way to discover the nature of the least action pathway of a planet is not to look into the narrow visible band of your telescope, because that instrument won't give it to you. You have to look into your own mind and search for a triply-connected function that will reflect such a least action pathway analogous to the [*Plasma Universe*](#). You must look for the links that correlate your little existence with the existence of the universe as a whole. And, that's a hard thing to do.

As Lyn reminded us in the above mentioned internal memo, the fallacious Newtonian notion of “force” need not be considered at all if one looks into the Cusa and Leibniz principle of least action. What is required is to understand the principle of constructive geometry in the manner that Plato had done in his *Timaeus*. As Lyn put it in that report:

“The ideas we associate with the notion of "forces," arise as we attempt to account for the possibility of action outside of least-action ("force-free") pathways. Kepler's laws of physics are based, "axiomatically," on the demonstration that the most fundamental laws of physics exclude all notions of "forces." The fundamental laws of physics, properly conceived, are stated entirely in terms of least action, in which no notion of "force" need be considered; only the constructive geometry of physical space-time need be considered. The fundamental opposition of Galileo and Newton to the physics of Kepler, is the simplest case in point, by aid of which we might show how the notion of "forces" was introduced to teaching of physics.”

“Cusa founded modern science, by elaborating general principles of scientific method coherent with Cusa's discovery of the Maximum Minimum (Least Action) Principle. The collaborators, Luca Pacioli and Leonardo da Vinci, founded applied physics, by showing that the application of Cusa's Maximum-Minimum Principle to crucial experimental evidence sufficed to identify and prove the specific kind of geometry of universal physical space-time. By showing that Golden-Section harmonics coincided with both the most general laws of physics, and also living processes, whereas non-living processes do not so coincide, Pacioli and Leonardo proved implicitly that the geometry of our physical space-time is that of a Gauss-Riemann multiply-connected (hyperspherical) manifold. The proof of the work of Cusa, Pacioli, and Leonardo, on this specific point, was the basis for the hypotheses employed by Kepler to establish a comprehensive mathematical physics.

“In a constructive geometry centered around the isoperimetric theorem, lines, points, surfaces, solids, hypersolids, and the implicit innumerability of countable topological harmonic relations, have the character of singularities which are derived, created, by purely constructive methods, from elementary, multiply-connected circular action. The physical space-time cohering with such an elementary, constructive geometry, requires that the notion of time-based action be incorporated, thus superseding physical space by physical space-time. Uniform, least-action forms of time-extension require that we supersede simply circular action by extended circular action, which can be only, either cylindrical or conical extension. The proof that the highest orders of action in physical space-time are coherent with the Golden Section's harmonics, suffices to prove conclusively, that the geometry of physical space-time is multiply-connected [conical, self-similar-spiral] action.

“Physical space-time is not the time-extension of physical space. "Instantaneous" physical space has no existence; only transformations in physical space-time exist; there is no existence but that of an harmonically-ordered transformation in physical space-time, and this exists only in the Gauss-Riemann space of conic forms of multiply-connected, self-similar-spiral action.” (Ibidem)

There is very little doubt that most galaxies are generated, as Tony Peratt demonstrated in his computer models, by doubly-connected poloidal and toroidal least action, and so are DNA strands of living processes, and musical modalities of the well-tempered-system; however, such a form of least action should not be viewed as “curve-fitting.” The “look alike” forms of sense perception are not sufficient to understand the nature of a triply-connected Galactic motion. What is required, in addition to the torus, is conical spiral action integrated within it. Integrate the three motions together, and you have a Galactic form of triply-connected motion. The problem, however, is that such a form of triply-connected action cannot be visualized; and that’s the beauty of it.

THE PERATT MODEL OF THE DOUBLY-CONNECTED GALAXY

“So the idea that you know the past, on the basis of your experience, of a trend in things; and the trend is not the maker. And Brunelleschi made it very clear, that you had to get rid of all these assumptions that there's continuity in history, a simple continuity, where one part of the society goes to the next part of society. What there are, in fact, have been great breaks, like Brunelleschi, who has concentrated on that issue, the great breaks in history up to that time.”

Lyndon LaRouche, Briefing, Dec 8, 2015.

The most essential aspect of going from elementary triple circular action to doubly-connected toroidal action is to make the required historical break with past axioms; that is, exclude your dependency on sense perception and on curve fitting and replace curve fitting by rotational action in both the physical and the epistemological domains, from the Macrocosm to the Microcosm; that is, from the top down. This raises a fundamental question: “What is it in the large that is capable of replicating itself in the small?”

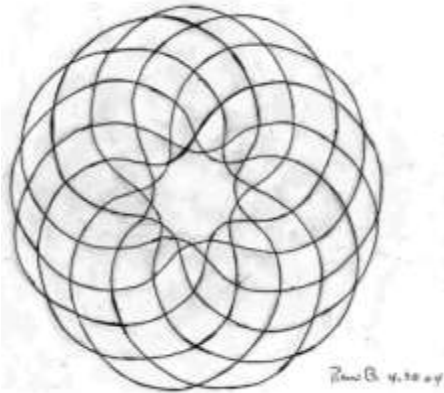


Figure 1 Torus Least Action. For a free-hand demonstration, see my 1996 video. https://www.youtube.com/watch?feature=player_embedded&v=qJk9N1VJBCk

The dominant idea that can help you answer that question is the least action form of Maximum-Minimum principle of Nicholas of Cusa; Maximum-Minimum principle simply meaning: *the maximum amount of area must be constrained by the minimum amount of perimetric action*. This is why Cusa called his principle: the “*Isoperimetric Principle*.”

Apply the *Isoperimetric Principle* to the construction of a Galactic torus in the following manner and imagine that this is how the Galaxy and your mind work as opposed to your brain or sense perception. (**Figure 1**)

The key epistemological feature of this toroidal construction lies in the elimination from your mind of the dominating need for sense certainty, and the replacing of that need with the imagining of a time reversal least action that is going around its own circular motion, like a planet rotating on itself, and going around the Sun at the same time. But, in this case, you have to think galactically; that is, you have to imagine two galactic clouds rotating around each other as Peratt designed them.

The first action is *poloidal* and the second is *toroidal*. It is the integration of the two together as a single motion, which is *isoperimetric*. This is what the Galaxy generates from within its own torus cradle and which produces the effect of a self-similar spiral action, which then becomes visually representable as a third and separate form of action. But, it is not a separate action. The three actions are one, but you cannot observe the three motions in the same space-time action.

This is the triply-connected form of least action that the human mind requires to generate ideas from, but most people don't know that because they don't pay attention to how their mind works. They don't realize that because they don't make the break with the past, and adhere to a process that is not visible, and so they miss out on the most exciting aspect of their lives. So, the problem is not that people cannot know this; the problem is that people don't do the required mental effort to see with their minds eye instead of their physical eyes. This is the reason why I emphasize the necessity to go back to Plato and to rediscover Plato's Cave, that is, discover how he replaced sense perception by the principle of proportional reason. Take, for example, the case of the proportion between the human mind and the intelligence of the heavens with respect to vision. Plato wrote:

“God gave us sight to the end that we might behold the courses of intelligence in the heaven, and apply them to the courses of our own intelligence which are akin to them, the unperturbed to the perturbed, and that we, learning them and partaking of the natural truth of reason, might

*imitate the absolutely unerring course of God and regulate our own vagaries. The same may be affirmed of speech and hearing.” (Plato, *The Timaeus*, 47, b-c.)*

The point that Lyn made in his memo on Dan Wells is precisely the same as Plato's when he called on the human mind to look for this correlation between Macrocosm and Microcosm; that is, when anomalous phenomena taking place in the very large can also be found in the very small. In other words, Lyn was counting on some of us to use Plato's yardstick of proportional reason and apply it to his higher hypothesis. But very few of us did that for different reasons that I will not go into at this time.

Moreover, it is also ironic that among the top original thinkers in Plasma Physics, most notably, Hames Alfven, Winston Bostick, Tony Peratt, and Dan Wells, to mention only a few of the early ones, only Peratt succeeded in applying that principle of correlation based on the proportionality between Laboratory



Plasma and Interstellar Plasma. As Peratt reported: “In fact, the 3D particle-in-cell simulations of space plasma, a topic pursued by myself under the guidance of Prof. Hannes Alfvén, Royal Institute of Technology, Stockholm, for 23 years and Prof. Oscar Buneman, Stanford University, for 12 years depict the profiles over the full electromagnetic spectrum.” (Personal correspondence) Just to remind you that this is what I had most emphatically emphasized in my 2012 report on [**THE PLASMA UNIVERSE IS A MATTER OF MIND.**](#)

Figure 2 Anthony L. Peratt

The point is that what Peratt has done, here, is something like the Brunelleschi Dome of Florence: he has done the impossible. Not only are the three radio telescope observations in the top row of **Figure 3** different galaxies with astronomical parsecs space-time expansion differences from left to right in the

order of 10^9 , but the plasma laboratory simulations in the bottom row have the same proportional time frame in the order of 10^{-4} . That correlation beats statistics any day, because what appears to be an impossible sense perception coincidence between the extremely large and the extremely small is actually a reflection of causality emerging from the shadows of Plato's Cave. Scientists have yet to take that proportional range into account.

Why can't scientists make the leap that Peratt suggested when he said: "The investigation of complex filamentation processes in laboratory plasmas by the particle-in-cell approach has thus led to unexpected analogies in cosmic plasmas." (Anthony L. Peratt, [*Evolution of the Plasma Universe: II*](#), IEEE, December 6, 1986, p. 777)

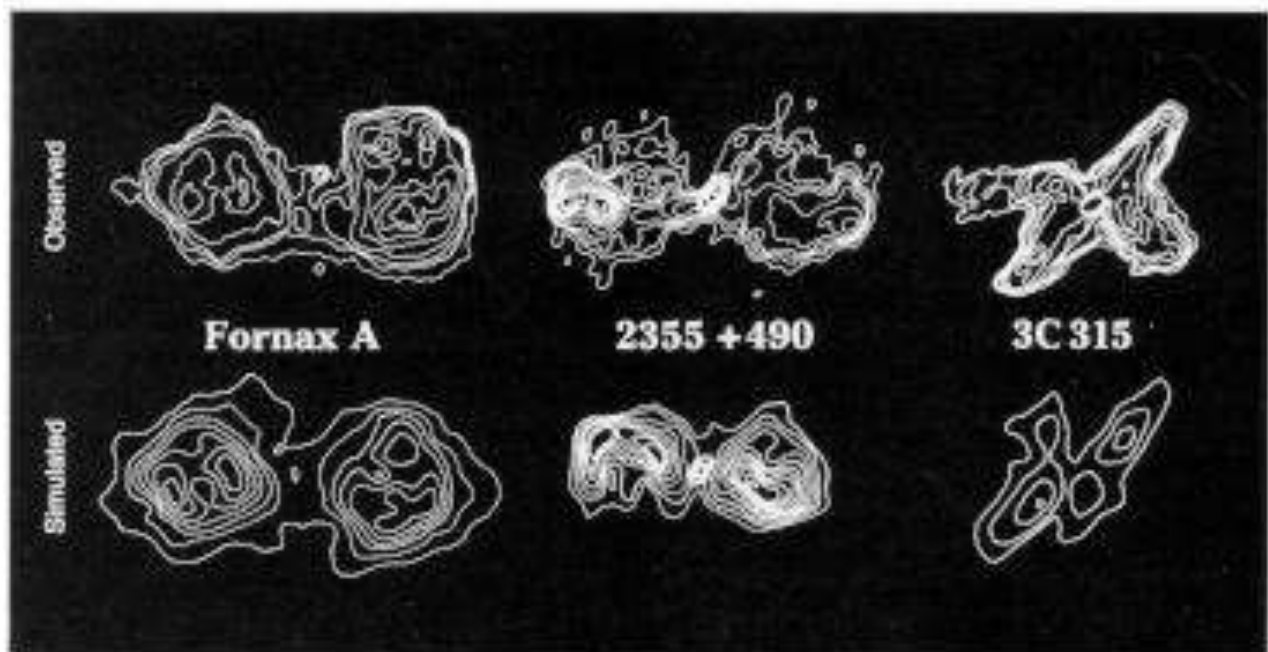


Figure 3 [*3-Dimensional Particle-in-Cell Simulations of Spiral Galaxies*](#). What do non-visible proportions look like? The upper series are footprints of observed double radio galaxies while the lower series is a computer simulation of laboratory plasmas. (See Anthony L. Peratt, *Physics of the Plasma Universe*, Springer-Verlag, 2nd ed. Publ. Sept. 2014.)

The irony, here, is located in the great Platonic leap between Macrophysics to Microphysics. Here, Peratt demonstrated that there is a correlation between two incommensurable magnitudes which causes an anomaly within the narrow band on human vision. Thus, not only did he cause to show that there existed a common anomaly between the two magnitudes, but he also implied that the universe progresses by revolutionary change. However, what is Peratt's revolution all about? He never spoke of a revolution, and I don't think that he even looks at himself as a revolutionary. So, what is there to discover here about a revolutionary change?

For decades at the Los Alamos National Laboratory in New Mexico, Tony Peratt has been using a supercomputer to replicate the idea of galaxies that Hannes Alfvén had originally considered as being formed by primordial plasma clouds spinning inside of doubly-connected Birkeland filaments. What is revolutionary about that is that Peratt rediscovered the least action principle of Cusa and Leibniz in the footsteps of Plato. In his approach, Peratt devised a beautiful metaphor of a least action transformation whereby two spherical clouds of plasma become pinched between two Birkeland magnetic filaments, each of which carrying a charge of about 10^{18} amperes.

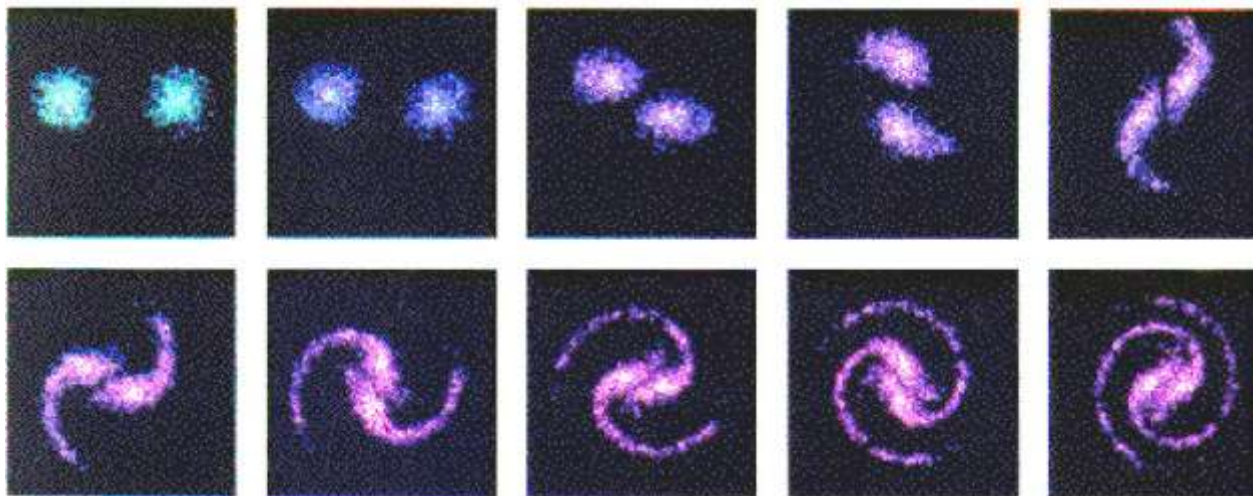


Figure 4 Supercomputer simulation of a spiral galaxy according to Anthony Peratt.
<http://www.plasma-universe.com/images/1/16/Peratt-galaxy-simulation.gif>

The computer simulation of **Figure 4** shows, in the small, the way that charged particles interact under Birkeland electrical currents by spinning around each other within a Torus, until two main spiral arms begin to emerge to form a mature spiral galaxy. However, Peratt made the point in his [*Plasma Universe*](#) that his approach had nothing to do with what he called “the anti-science blogsites of the holoscience ‘electric universe.’”

The point is that there is an axiomatic change, here, that most people don't see and don't understand. The above simulation is not a look-alike perception of the galaxy and the plasma; this is a proportional correlation between physical action in the large and mental action in the small. This is how the universe and the mind as a whole work together in order to create something new in the universe. Thus, change takes place in the universe by improving on the universe through improving insight into previous knowledge. That's what is revolutionary about what Peratt accomplished with respect to Newton. He has found a least action way to *replace sense perception-based science by intelligence-based science; that is, by correlating intelligence in the cosmos with intelligence in the laboratory of the creative human mind, just like Plato had done.*

The most significant result of Peratt's plasma model for the galaxy is that this “intelligent” fourth state of matter does not correspond at all to the Newtonian universe, because it is no longer based on solid objects acting on each other at a distance in empty space. The point he made is that there is no such a thing as Newtonian empty space. The [*Plasma Universe*](#), which is 99.999 % of our universe, is filled with electromagnetic radiation, magnetic and electric fields in constant transformation at temperatures and densities that far exceed those of gas, liquid, and solid states of our sense perception universe. As Peratt put it:

“Space, being the most voluminous of the cosmos, when treated as pure vacuum, gives a false sense that most of the universe is in a known state, the only unknowns being the point-like masses occupying Newton's universe. The discovery of the complexity of the planetary plasma magnetospheres proved that space is plasma with an electrodynamic complexity that exceeds that of the first three states of matter.” (Anthony L.

Peratt, [ADVANCES IN NUMERICAL MODELING OF ASTROPHYSICAL AND SPACE PLASMAS, Part II](#). Astrophysical Force Laws on the Large Scale, Los Alamos National Laboratory, New Mexico, USA, 1998, p. 54.)

Thus, to put it galactically, the required thinking is to have a more complex insight about the future, which means, stop thinking like mathemagicians about earthly solid things moving around in the sense perception spectrum and consider how man must live in the whole of space, by including himself and his relevant investigations within the full electromagnetic spectrum of the [Plasma Universe](#).

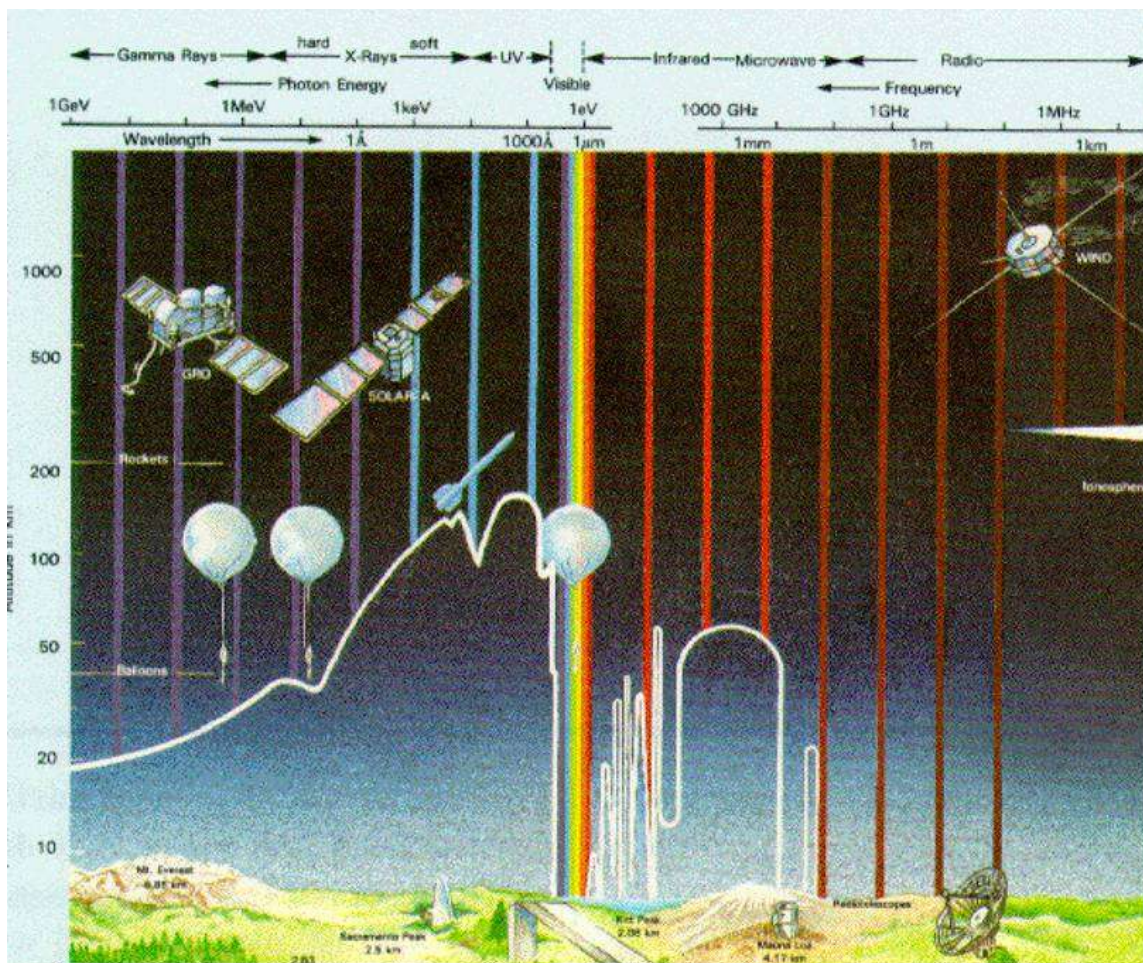


Figure 5 “Altitude of penetration in the Earth’s atmosphere of electromagnetic radiation.” (Anthony L. Peratt, [Advances in Numerical Modeling of Astrophysical and Space Plasmas, Part II](#), Los Alamos National Laboratory.)

CONCLUSION: THE SINGULARITY OF THE PINCH-EFFECT

What is the basis for Peratt's revolutionary change? How do you jump from a known gravitational universe based on solid, liquid, and gas states into the unknown of an electromagnetodynamic [Plasma Universe](#)? The short answer is that you can only jump after you have been pinched for that purpose. You have to go through the singularity of the "Pinch-Effect." Peratt would say: "You have to give up your 'Bias of a Visual Universe.'"

The problem is that the so-called "Visual Universe" is only a small portion of what exists and scientists continue to make the claim that this is how the world should be. Can you imagine how it would



feel like to walk around looking through a narrow slit of the universe during your entire life and never be able to see what is on the left or the right of that area? Sorry, but the short band of the visual universe is only a small part of the whole electromagnetic spectrum. The rest of the Universe is much greater and much different in its characteristics. How do you deal with that problem of narrow sightedness? How do you broaden your horizon and increase your energy levels at the same time?

Figure 6 The Pinch-Effect: Prince Charles trying to feed on a victim.

One of the most important ideas about the morphology of the [Plasma Universe](#) that Peratt discovered is that it is filamentary and filled with anomalous singularities, as Alfvén had hypothesized in 1950. The universe is not continuous,

but discontinuous. In other words, the universe we live in is not made of little hard balls that go bang in the night or that fall on your head in order to make you think. That's not how the universe works and that's not what is called thinking. What if the universe were as Peratt put it: "A Sea of Electrically charged Particles?"

The beauty of the [Plasma Universe](#) is that it is in a constant motion that takes the form of filaments of condensed matter that are mostly unobservable, but which are recognizable by the effect they produce and by the radiation they emit; that is to say, recognizable by the resulting increase in energy-flux-density that they generate; and that is what makes the previous Newtonian world view look stupid by comparison. And nothing in the past could have made this new [Plasma Universe](#) world view possible. Like Brunelleschi's Coupola, the [Plasma Universe](#) is impossible to build from past knowledge.

The proof in the pudding is, therefore, located in the increasing power of the effect. Such increases are produced by creating pinches in the center of the plasma torus during a pulse discharge. Such pinches are known as the Bennett-pinch or the Zeta-pinch, or Theta-pinch, depending on the direction of the process. The Z-pinch device is used in plasma experiments as a mechanism that concentrates or pinches the plasma in order to cause an increase in the levels of energy-density. If you have not yet felt the effect of that pinch, then, you must read this paper one more time.

The reason why the Z-pinch is such a fascinating singularity is because it acts like a tornado sort of anomaly which can produce high energy densities and high radiation emissions as an effect. You can conceive of the pinch-effect as a transient plasma column being squeezed in the center of a torus where the curvature of the torus is transformed by a double electrical current that makes it go into an inversion from positive curvature to negative curvature. In fact, this is always how you make discoveries of principle. You see, I warned you: the Universe is never what it appears to be.



Figure 7 The IEEE Z-Pinch Logo.

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