From the desk of Pierre Beaudry

SPACE-TIME AS A MEASURE OF CHANGE

by Pierre Beaudry, 12/06/2009

1- THE CRAB NEBULA AND THE SCHOOL OF ATHENS

> "The easy part of creativity is to set your sight on a summit that is slightly beyond the range of your soaring flight capability. The difficult part is to dare leap for it!" (Dehors Debonneheure)

Sometimes I long for those ancient Greek times when every leap of discontinuity in understanding universal historical phenomena was explained by the gods of Olympus, who, each in their own way, used some extraordinary gap-filler to convince human beings of what they did not inderstand about their lives. Such divine "spin," as we would call it today, did the trick back then. In those days, except for the Pythagorean and Platonic schools, there were no unknowns left! Everything had an explanation. I guess those were the days when men were happy to have their gods fill in for their lack of resolve in seeking solutions for their apparently insolvable problems. But, sometimes, I also wonder if there ever were such a time when ignorance of these disguises of historical discontinuities reflected such a blissful state of the human spirit. At any rate, in those days, the gods did not have to convince human beings of what they didn't know. A thunderbolt was enough to explain things.

Nowadays, the gods of Olympus have been replaced by politicians or similar creatures. And, everything must be given a ”spin”, that is, an explanation in accordance with some acceptable concensus. So, it is the same with the question of Time. If I were to ask you a truly embarrassing question such as: **What is Time?** What would your answer be?

In his book on ***The Tyranny of Time***, French astronomer Charles Nordmann (1881-1940) was also momentarily relieved by reminding himself that even on this question of Time, the gods of Olympus had not left us out on the lurch. As Nordmann put it, ”had you asked a wealthy citizen of Athens or a cobbler in a booth under the shadow of the Parthenon, what he understood by Time, he would have replied that it was a thin muscular old man standing between a formidable scythe and a slim hour-glass, who presided over the daily course of our miserable destinies. Old Chronos is figured like that even in modern ingravings.” (Charles Nordmann, ***The Tyranny of Time, Einstein or Bergson,*** New York International Publishers, 1925, p. 16.) However, Nordmann knew that this answer did not satisfy the truly inquisitive mind grappling with the question in all of its forms.

Today’s lower boundary limit of time appears to be traveling in our solar system, and Dante may have been the poet best suited to help us understand some essential aspects of this perplexing flight beyond mother Earth. As Dante wrote:

”And she who reads me as I read myself,
to quiet the commotion of my mind,
opened her lips before I opened mine
to ask, and she began: ’You make yourself
obtuse with false imagining; you can
not see what you would see if you dispelled it.
You are not on earth as you believe;
but lightning, flying from its own abode,
is less swift than you are, returning home.”
While I was freed from my first doubt by these
brief words she smiled to me, I was caught
in new perplexity. I said: ”I was
content already ; after such great wonder,
I rested . But again, I wonder how
my body rises past these lighter bodies.”
(Dante, ***Paradiso***)

Dante was probably the first to properly raise the question of what defines man in space rather than man on the Earth’s surface, and he noted that there was a species difference between the two states of being. So this means that we have to change our way of thinking about traveling in the universe. But, Dante may not have asked about gravitation and electromagnetism, nor did he wonder about Einstein’s relativity or whether the Fitzgerald-Lorentz contraction had affected his flight to Paradise, but he did imagine how divine the experiment should be in rising above the surface of our planet as

opposed to rubbing one's nose against the grindstone. The same questions will need to be asked of Vernadsky from the standpoint of geochemistry when we have access to the English translation of his 1931 work on space-time. Meanwhile, it is now time for us to ask those questions, especially with respect to the larger questions of traveling in continuous space-time such as a voyage to Mars and to even reach out toward the ***Crab Nebula***, for example. What is to be discovered is not only how the ***Crab Nebula*** is affecting us with its multiple forms of radiation from such a great distance, but, also, how it provides us with a true relativistic measuring rod in its process of change, visually or musically speaking. Standing on our little planet, we are used to solar system changes and velocities, but we do not yet have a sense of changes among the fixed stars. What is the ***measure of change*** with fixed stars?

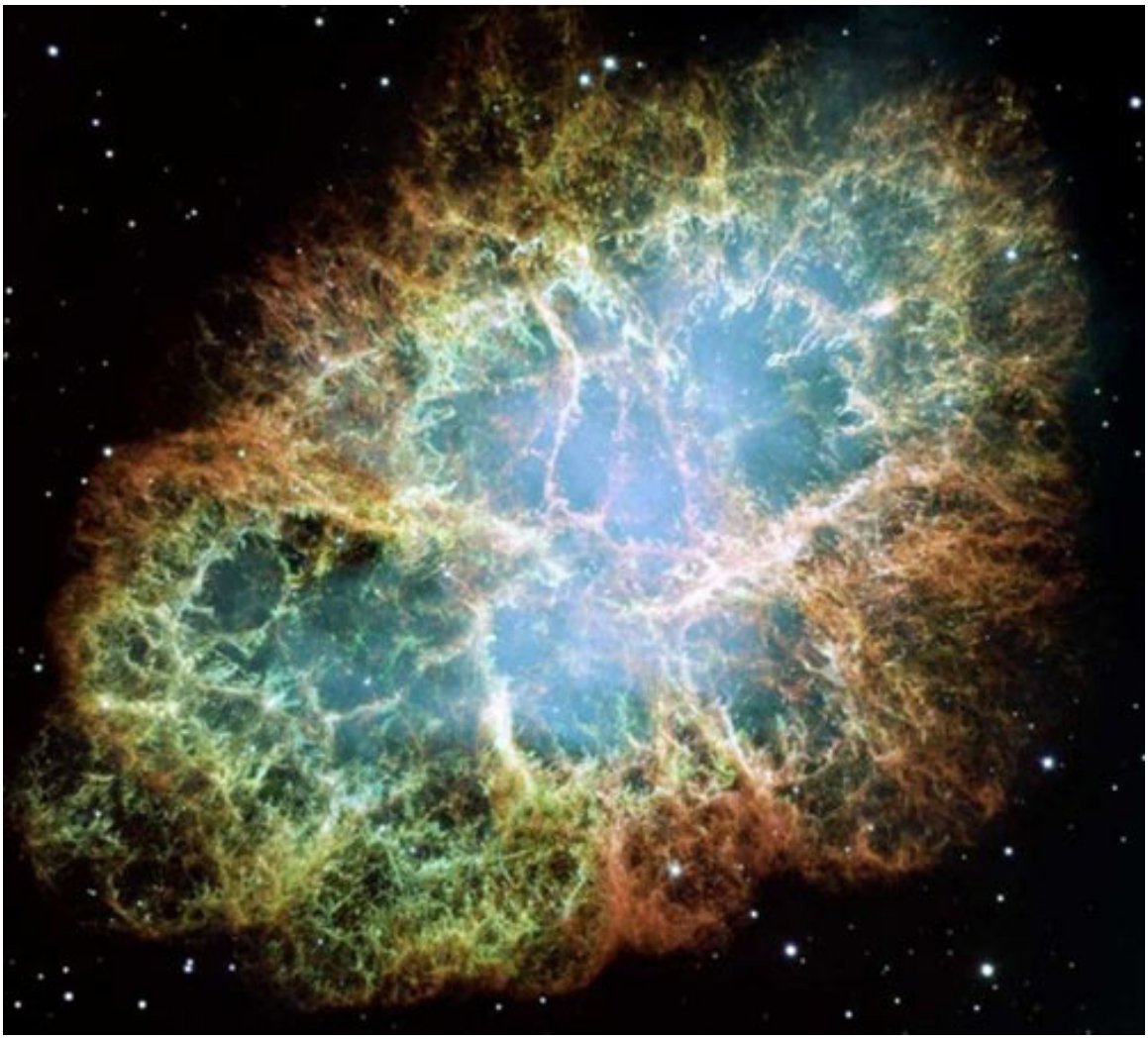


Figure 1. God, ***The Crab Nebula***, 1054-2009. [The new 2009 NASA/ESA Hubble Space Telescope image of the entire Crab Nebula in super photographic high resolution.] The different colors show the different activities of the electrons, protons, and neutrons. The red corresponds to electrons recombining with protons forming hydrogen; the green

shows electrons rotating around the magnetic field of the pulsar; and the blue reflects the neutron core of the pulsar. Its appearance in 1054 was so powerful that the bright star remained visible to the eye for 23 days and 653 nights after its explosion. Its pulsar center rotates about thirty times a second and emits pulses of radiation composed of a range that goes from gamma rays to radio waves, all of which affect the Earth at their respective velocities. As indicated by David Cherry, ***Redshifts and the Spirit Of Scientific Inquiries,***" 21st Century, May-June 1989, observations of nebulas should rather be inspired by the Plasma Theory rather than by the Big Bang Theory.

Here is a time-lapse video recording simulation using the imagery of the Hubble telescope and showing how this explosion has been going on for the last 955 years. If you dare let your imagination get a hold of that fugitive object, ask yourself: what does the ***Crab Nebula*** have in common with ***The School of Athens***?

Crab Supernova Explosion.mht

Here, I will hypothesize that the ***Crab Nebula*** has a special form of space-time which produces an effect that is very similar to Raphael Sanzio's ***The School of Athens***; that is to say, producing the effect of the simultaneity of eternity in the very large. The ***Crab Nebula*** seems to express a very special form of spatial and timing development that not only represent God's brushwork of electromagnetic and gravitational fields, but also seems to be expressing the catenary-tractrix effect of the Lorentz contraction in a furious way. However, be that as it may, the ***Crab Nebula*** magnitude is of such an imposing size that any space-time action within such an immense object is simply not apprehendable by our normal sense-perception apparatus, and assuredly not through a simple Hubble sighting or comparative images.

Around the 21st of January, you will be able to locate the ***Crab Nebula*** at the Leesburg-Zenith of your astrolabe, just a short distance from the alpha star, Aldebaran, in the constellation of Taurus. You will not see it with your naked eye, but you will know it is there a little shy of 9 o'clock in the evening, at about 1 ½ ° degree off of the ecliptic. That celestial location was the site of a supernova explosion of at least a magnitude-ten star that first became visible on July 4th 1054, and was observed for the first time by Chinese, Japanese, Korean, and Arab astronomers. This means that the image of the Crab we see today should be viewed as the simultaneity of eternity of a process that took about 955 years to unfold until now, which makes this great scientific fire-work of art about 500 years older than Raphael's ***The School of Athens.*** As I will now show, they both have very similar characteristics with respect to space and time.

First of all, the distance of the exploded star is much greater than the duration of man's observation of it. By comparison, we have only been admiring the Raphael fresco of ***The School of Athens*** for 500 years and, yet, the conceptual explosion of the original Greek school of thought began to bloom about 2,400 years ago. Although the apparent slow time-lapse motion of the celestial flower has taken only 955 years to develop into its present bloom, the explosive event of the ***Crab Nebula*** actually occurred 5,600 light

years ago! This means that when astronomers observed the explosion in 1054, the event had already been extinct for more than five millennia and its dramatic display no longer existed at that time! Perplexing thought that presents us with a spectacle that is no longer there, but which still affects us today with the showers of its radiation and the deadly beauty of its artistic and scientific composition. The play may be over, the curtains may have been drawn over the event for a very long time, and the actors all deceased; yet the drama of those events is still affecting the course of our daily lives. One might think that what we see has robbed us of its presence, because what reaches us is but the fading memory of what no longer exists, but that is not true. The Greek revolution is still shaping the Noosphere of our minds today just as the supernova explosion is still affecting the Biosphere of our planet. This is the reason why we should now take a peek behind the curtain of those past tragedies and begin to understand the significance of man as he investigates his real home of space-time within the simultaneity of eternity. But, think like Dante, as if through a glass darkly, that is, as if through the caustic effect of a new sunrise:

> "More is permitted to our powers there
> than is permitted here, by virtue of
> that place, made for mankind as its true home.
> I did not bear it long, but not so briefly
> as not to see it sparkling round about,
> like molten iron emerging from the fire;
> and suddenly it seemed that day had been
> added to day, as if the One who can
> had graced the heavens with a second sun."
> (Dante Alighieri, ***Paradiso,*** Translation Allen Mandelbaum, Bantam Books, Toronto, 1986.)

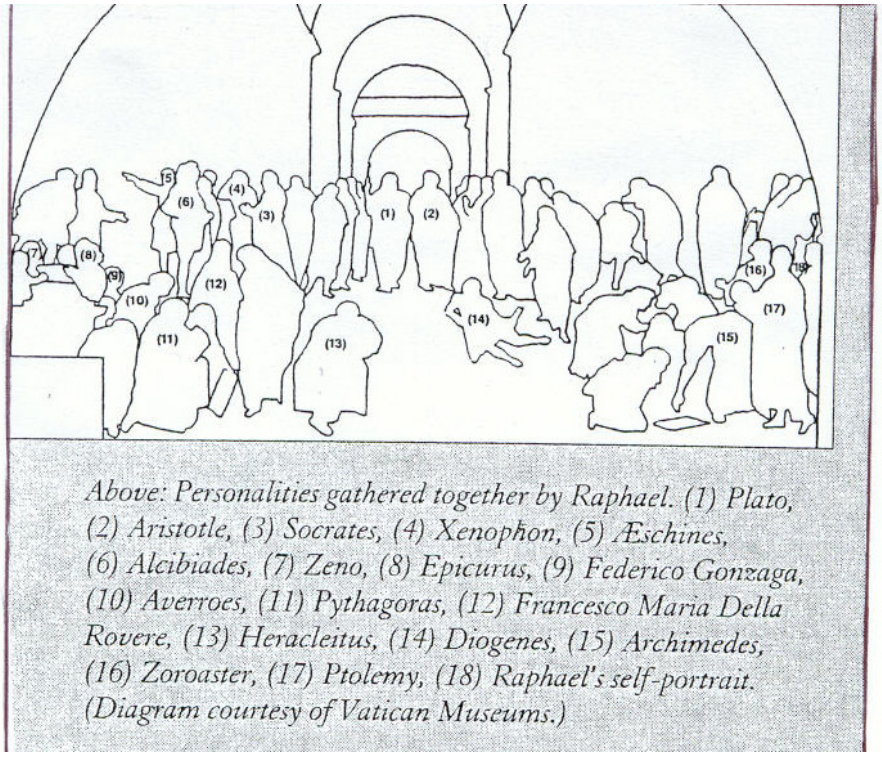
As Raphael's ***School of Athens*** itself shows, God's ***Crab Nebula*** is a very dynamic process that only appears to be frozen in time, as if captured in one moment of simultaneity of eternity, where everything gathered, but nothing seemed to have moved during several lifetimes. But, look closer; the finger of God is moving it toward us. In the composition of ***The School of Athens,*** different people have come together, similarly, from different space-times of the past, as if to exhibit their discoveries with the intention of having them rediscovered in some future moment of space-time observation from an explorer of artistic-scientific composition, who would be more or less distant from each of them, in another time, but who would have relived the same idea. The events may be from the past, but it is about the future of mankind. So, it happens that, in the ***Crab Nebula*** a moment is captured where God exhibits different events, also coming together from different space-times of our galaxy, as if the choice of each event were meant to express a different experiment intentionally made for some future observer, more or less relatively distant from each of them, but also uniquely expressing the simultaneity of eternity of the whole process. Strange coincidences that bring imagination and mind together, as the Biosphere with the Noosphere, the mortal with the immortal! What is the significance of such coincidences? What are God and Raphael trying to tell us?

First, look at the results in space-time assembled by Raphael Sanzio, who created a fresco that established an epistemological explosion that is still very visible and effective today between Plato and Aristotle, by comparing the portraits of several generations of Greek thinkers who lived several centuries apart, and who were all centered on the irreconcilable mind-sets that opposed those two paradigmatic figures. What does that tell you about the ***Crab Nebula*** explosion? The two events reflect the same dynamic of axiomatic change in the two respective fields of study of science and artistic composition that are necessary to identify in two very different domains with the same dynamic of a ***measure of change*** for future space-travel, that is, one in physics and the other in epistemology. So, ask yourself: what is the ***measure of change*** of space-time composition in each of those two cases?

First of all, what must be noted is the fact that Raphael concentrated on the epistemological differences that existed between Plato and Aristotle, in the very sense that Lyn identified between the type ***'A'*** and type ***'B'*** personalities. Raphael established the curvature of the relevant epistemological distances that an array of past discoverers expressed with respect to both of them; and thus, he established relevant space-time incubating distances of axiomatic changes among the historic figures, and especially with respect to the different angular views on morality, geometry, music, and astronomy between the two central figures. Here is how Lyn identified for us the broad strokes of the fresco:

> "Consider each figure in that portrait. Assign the place of habitation, and dates of birth and death of each figure. Now consider the interactions among these historic figures, the interaction of ideas, as for better or for worse.
>
> The principle lesson to be adduced is the aspects of that image of ***The School of Athens*** which should bear on the choice of motives of a person's sense of the purpose and meaning of the outcome of having lived one's mortal life: the notion of what one must become in the immortal outcome of living a mortal life, and living that life according to the notion of a universal principle of creativity as the distinction, the essential content, and the true purpose of a human mortal life." (Lyndon LaRouche, ***The Science of Society***, EIR, November 10, 2009.)

In both of those works of art, the simultaneity of intention by their creators appears to be such that each represents an extended moment of universal action that must bring about immortality to mankind or bring about a catastrophic end to those members of our species who choose to remain behind. Both are warnings to move mankind away from apparent existential limitations of mere mortality and to move them to take flight into the domain of creative immortality. Let's look at the significance of space-time from the artistic/scientific angular measure of such an extended universal action. Study the space-time of the different people represented in the ***School of Athens*** all centered on Plato and Aristotle, and compare them with the space-time effects of the ***Crab Nebula*** all centered on the pulsar. What do you have?



Above: Personalities gathered together by Raphael. (1) Plato, (2) Aristotle, (3) Socrates, (4) Xenophon, (5) Æschines, (6) Alcibiades, (7) Zeno, (8) Epicurus, (9) Federico Gonzaga, (10) Averroes, (11) Pythagoras, (12) Francesco Maria Della Rovere, (13) Heracleitus, (14) Diogenes, (15) Archimedes, (16) Zoroaster, (17) Ptolemy, (18) Raphael's self-portrait. (Diagram courtesy of Vatican Museums.)

Figure2. Raphael Sanzio, ***The School of Athens***, 1509. You can examine the changes in space-time of all of the characters relative to the great explosion of Greek civilization that began with Pythagoras and bloomed like the great flower of Western Civilization until

today. How is the ***measure of change*** in the space-time of the actors of the painting expressed by the physical curvature of the creative process represented by the different purposes of these individuals by Raphael?

The personalities assembled by Raphael express different distances that are not determined by their physical proximity, but rather by their epistemological distances to either Plato or Aristotle. It is these epistemological differences that are to be investigated, for example, in Zeno, Epicurus, Frederico Gonzaga, Averroes, Francesco Maria Della Rovere, Diogenes, Zoroaster, and Ptolemy, who are all axiomatically attached to the Aristotelian dogma of sense perception as expressed by his ***Ethics to Nichomachus***, that he is holding in his hand, while Socrates, Xenophon, Aeschines, Alcibiades, Pythagoras, Heraclites, Archimedes, and Raphael himself, are all attached to the domain of ideas as expressed in the ***Timaeus*** of Plato. These two groups are essential to identify, because their epistemological distinction represents a life and death struggle for the immortality of the human species.

In a nutshell, the epistemological difference is expressed in the two books held by Plato and Aristotle exhibited in the center of the fresco. Therein lies the difference in mind-sets between Plato's republicanism and Aristotle's oligarchism; that is to say, between man considered as created in the Image of God (sense-conception), or man considered as created in the image of the animal (sense perception). These represent essentially the two types ***'A'*** and type ***'B'*** personalities that Lyn has been emphasizing in his most recent papers and which offer the axiomatic basis for understanding the ***measure of change*** expressed by Raphael in his fresco.

Raphael captured this fundamental epistemological difference in the simple gestures of Plato and Aristotle. The elevating gesture of Plato pointing to the immortality of the heavens indicates the required elevation of the human mind to the divine creative process, as expressed in his ***Timaeus***; while the gesture of Aristotle, pointing down to the mortality of the earth indicates the pragmatic principle of manipulating the appetites of men as one does with the training of animals in accordance with the traditional Cult of Apollo at Delphi, as recommended by his ***Ethics to Nichomachus***. These two opposite fundamental principles have not only divided societies inside of Western civilization for thousands of years, but also societies in the Eastern civilizations as well. This being the case, let us now see how such physical and epistemological effects of space-time relate axiomatically, with respect to the Einsteinian ***measure of change,*** in terms of this crucial difference between either being earth-bound or being space-bound, or in terms of type ***'A'*** or type ***'B'*** personalities.

2- ON THE COMPOSITION OF VELOCITIES

In 1851, while pursuing studies on the Fresnel light fringe aberrations, the French scientist, Hyppolyte Fizeau, made an extraordinary discovery in which he was able to establish how the speed of light was modified while traveling inside a flow of water. The

time measured with an interferometer demonstrated a speed of light of 220,000 kilometers per second, that is, 80,000 kilometers a second less that the speed of light in the vacuum of empty space. In other words, you can change the speed of light by running it through the medium of water. This raised the questions: can the speed of light tell us anything about the existence of some sort of ether? Is the speed of light affected by gravitation?

In 1675, it was the Danish astronomer, Ole Roemer, who discovered the first approximation for the speed of light. While observing the eclipse of one of Jupiter's moon on two occasions taken six months apart, Roemer discovered that light took different times to reach the earth. Using the diameter of the Earth's orbit as a ***measure of change***, he concluded that light must have traveled about 200,000 kilometers a second. It was the difference in time when the moon remained in the shadow of Jupiter that gave Roemer the clue. The point is that the truth of that discovery, like all great discoveries, was not given by light, but by shadow! It was not the first time that the truth manifested itself by means of a shadow, and it won't be the last.

That 1851 ***measure of change*** by Fizeau was later confirmed by the Michelson-Morley experiment of 1886, by Hendrik Lorentz in 1892, and by Einstein in 1905. The result of these experiments demonstrated that it were possible to subtract from the speed of light, but not to add to it. This was not only strange but also begged the question of how velocities could be added to each other, and how they would affect each other. The same question is also valid for ideas. Can you add velocities to each other, and if so, does that cause an effect on them? For example, take the case of adding velocities as a problem of relativity in classical physics. If a boat is going 5 miles per hour on a smooth river, which itself is flowing at three miles an hour, what is the total speed of the boat? You might be tempted to answer, without any doubt, 8 miles per hour; that is, by adding velocity ***5*** to velocity ***3***. Therefore, $v_1 + v_2 = 8$.

However, Einstein would say that is wrong. And you would not be wrong for the same reason that Fermat was right when he proved Galileo wrong when he thought that the trajectory of a heavy object dropped from the top of the Tower of Pisa would follow the pathway of a straight line. "The trajectory," said Fermat, "has to be a curve!" However, going back to the question of composition of velocities, you might think that the solution only has to account for the two speeds, thus: $w = v_1 + v_2$. Wrong again. The solution has to come from a level higher than that of the Tower of Pisa.

As did Nordmann, so too must I apologize to the reader for introducing an algebraic formula in this report. However, sometimes certain formulas may be pedagogically useful, as in this present case, because it can act as a remote shadow of the real world. As Nordmann said, "it spares me a large number of words, and it is so simple that every reader who has even a tincture of elementary mathematics will at once see its great significance and the consequences of it." (Charles Nordmann, ***Einstein and the Universe***, New York, Henry Holt and Company, 1922, p. 93) Indeed, once you have made the decision to jump over its apparent jagged character, even a non-mathematical person like me can see what this formula is doing.

Here, I will use mathematics with caution in order to stress the same point that Lyn made about the danger of mathematical dependency. Mathematics can be an opium den as well as a crocodile pond: it either takes you over or it chases you away. In both cases it prevents you from having accessing to science. In both cases, whether you succeed or not, mathematics makes you stupid. It can either destroy your mind by ***addiction to deduction***, or, as Nordmann put it, it can also be like "reptiles keeping inquisitive folk away from it (science); though there can be no doubt that they have, like our Gothic gargoyles, a hidden beauty of their own." (***Einstein and the Universe*** p. 2) As Lyn stressed, and Nordmann demonstrated, to counteract the negative effect of this addiction one has to take a strong antidote-injection of classical poetry.

Einstein demonstrated that two different velocities of a body in motion could not simply be added to one another, and that something else had to be added. He showed that the mass of a body in motion does not remain constant and depends on its velocity; that is to say, that mass contracts with the increase of velocity. This may not be perceptible for relatively small motions, but it becomes obvious with faster ones. In other words, the classical relativistic physics assumption was that:

$$w = v_1 + v_2$$

However, Einstein corrected that error by replacing it with the following equation:

$$w = \frac{v_1 + v_2}{1 + \frac{v_1 v_2}{C^2}}$$

Here, Einstein divided those two motions by a transformation of the Lorentz contraction equation and introducing the speed of light. Einstein added something which is not simply mathematical. He made conscious the fact that velocity changes a body in motion, at any speed up to and including the speed of light.

So, in this fashion, this mathematical construction had given the two speeds of the classical equation a chair to sit on, for all motions, and at any velocity. That was not merely a calculation on the part of Einstein; that was also a stepping-stone to a new way of looking at the world, a new measure that reality required: ***a change in the measure of change***. Thus, the equation $w = v_1 + v_2$ is no longer floating in thin air like an absolute ***a priori deduction.*** Ironically, Einstein injected some creativity into the mathematical equation. It is now grounded in reality on two counts. First, the Einstein construction says that w is not merely the result of the two velocities; its result must be based on something that must constantly change by including the factor of the speed of light C. In other words, the equation says that you cannot merely add two velocities without taking into account ***a Riemannean change in the measure of change***. Second, the equation also says that, v_1 and v_2 cannot be greater than the speed of light.

At length, what applies to two, or more, velocities will also apply to the relationship between mass and velocity. Since mass tends to change with constant acceleration, this means also that it could become potentially infinite if the velocity of a body were to reach the speed of light. Nordmann made the following comparison:

> "A mass of 1,000 grams will weigh an additional two grams at the velocity of 1,000 kilometers a second. It will weigh 1,060 grams at the velocity of 100,000 kilometers a second; 1,341 grams at the velocity of 200,000 kilometers a second; 2,000 grams (or double) at the velocity of 259,806 kilometers a second; 3,905 grams at the velocity of 290,000 kilometers a second." (***Einstein and the Universe*** p. 102.)

What is the significance of this relativistic increase in mass with increasing velocity? This question becomes very significant when you are planning a trip to Mars with 1-G constant acceleration and deceleration. As Lyn put it, you don't want to go too fast and come back like mush. The issue, here, is to understand the relationship between mass and velocity within space-time. It is for that reason that we couldn't send a human being to Mars at great-accelerated speeds without understanding first this Lorentz dissonant anomaly of contraction of mass in great velocities. Here you can hear Einstein's violin playing.

Great classical musicians also experimented with such increases in the density of singularities, such as Mozart developed in his ***Fantasy and Sonata in C Minor, K. 475/457.*** This might be fine for the speed of ideas, but, as Lyn pointed out, no one has ever experimented traveling in outer space at these higher velocities. In fact, the planets themselves cannot help us in this matter because the fastest one, Mercury, for example, travels a mere 100 kilometers a second. But what happens to the mass of an object when it travels at 150,000 kilometers a second? The reciprocity of velocity and mass contraction has the following feature to be considered. Take the example that Nordmann gave.

> "For instance, a measuring rod that moves at a velocity of 260,000 kilometers a second will not only have its length shortened by one-half, but will have its mass doubled at the same time. Hence its density, which is the relation of its mass to its volume, will be quadrupled.
>
> The physical ideas which were believed to be most solidly established, most constant, most unshakeable, have been uprooted by the storm of the new mechanics. They have become soft and plastic things moulded by velocity." (***Einstein and the Universe*** p. 109.)

Nordmann concluded from this that if the orbiting motion of the Earth were not 30 kilometers a second, as it is known to be, but instead, 260,000 kilometers a second, the Earth "would be shortened by one half its diameter in the plane of its motion (without any change in its dimensions in the perpendicular)." (Op. Cit., p. 48.) This is where the idea of "***interval***" comes into play as a crucial concept to which Nordmann refers, most

emphatically regarding Einstein's notion of relativistic space-time, and which will be discussed in the last section.

In the meantime, I will show how the break with the Euclidean and Newtonian states of mind of type ***'A'*** resides in the special characteristic of the Catenary/Tractrix function itself; that is to say, ***in the space-time interval of measuring change within the Catenary/Tractrix motion***. This motion reflects an amazing inversion of space-time during the interval of action between the two boundary limits of its envelopment/development process. It is within this "***interval***" of action that space-time can represent a new way of ***measuring change,*** as opposed to measuring empty space or absolute time between fixed things.

3- ABOUT LYN'S PAPER ON "THE SCIENCE OF PHYSICAL ECONOMY"

> "Nature doesn't care at all about human problems of understanding. It is not her role to adapt to our mind, but ours to adapt to hers." (Dehors Debonneheure.)

My first reading of Lyn's paper appeared to me much like the ***SYMPOSIUM*** of Plato, but in which it is the reader who is being served as the main course on the menu, and where he is made to discover, while simmering in his own juices of perplexity, that it is the unseen fruits of his mind which are going to be served on a platter of the new science of economics. At the end of that first reading, I thought I had understood most of what Lyn had written; but I soon realized that I had forgotten to look for the fundamental emotion of the piece. I had missed something quite sublime. This third part of my report will attempt to correct that omission.

As I went through a second reading, with that question of emotion in mind, Lyn's paper became more and more like a theme and variation (plus amplifications) on what the human mind has to avoid or has to accomplish in order to understand the science of physical economy of tomorrow. In that sense, the report seemed more like a sort of epistemological Great Fugue, as in Beethoven's ***Late Quartets***. However, as I was reading on, I kept looking for something more than a sweet bite to eat or the harmonic ordering of a musical composition. What I began to look for was the extraction of a fundamental emotion that was underlying the entire piece, the substantial bone marrow of the composition.

With that task orientation in mind, I began to realize that Lyn was defining something entirely new that he had never done before. He was going through the same epistemological parameters that he usually develops by means of which creative

discoveries of principle must provide the unique power of increasing potential relative population-density for the next fifty years and beyond. But, he was attempting to express them with a specific emotional light whose rays I had never perceived before. I had not brought the light of his hypothesis to the caustic demonstration of a crucial experiment. The emotional cathexis of the gestalt was still eluding my grasp until I began to hone in on the significance of the life and death question with respect to the recurring discussion of the type ***'A'*** and ***'B'*** personalities.

I was able to locate this life and death question through Lyn's constant recurring theme of the mental differences between personality ***'A'*** and personality ***'B,'*** and in the manner in which he related to them from the standpoint of relativistic physical space-time. This connection came to me in the section entitled, ***For Example: Space-Time***, where Lyn wrote: "**All humanity then becomes "people in space," rather than merely an Earth-bound species: hence, '*Ad Astra*!**'" The life and death question popped into my mind in the form of proportionality between the expressions of space and time and those two types ***'A'*** and ***'B.'*** (Lyndon LaRouche, ***The Science of Physical Economy***, EIR, September 18, 2009, Vol. 36 No. 36, p. 29)

Lyn's treatment of the two personalities were becoming the well-defined ***Arianne thread*** I was looking for; that is, in the case for space, type ***'A'*** emerged as the circle of formal geometry is to Euclid and type ***'B'*** was as the catenary of physical geometry is to Brunelleschi in the same proportion that, in the case for time, clock-time is to the mortality of type ***'A'*** as time-reversal is to the immortality of type ***'B.'*** Let me illustrate this space and time question with type ***'A'*** and type ***'B'*** in the following way: first with the question of relativity, and second with the effects of the dual motion of the catenary and tractrix curves.

Take the simple experiment of traveling in the direction of the Sun and traveling in the opposite direction away from the Sun, and think of the profound implications of that difference. Let's say that Peter and Paul leave Dulles Airport at the same time at noon, today, to travel halfway around the globe to New Delhi, which is about 12 longitude-hours away. Both must travel at the same speed and with the same type of airplane and chronometer, but Peter is traveling westward and Paul is traveling eastward. That is the only important difference between the two motions. Since they are traveling at the same speed and they are covering the same surface distance of the globe, you would think that Peter and Paul should arrive at the same time, but they don't. Why not? Not only can they not arrive at the same hour, but also they cannot even arrive at their destination on the same day. Why? The curious thing, though, is that if Peter and Paul had taken imaginary trains traveling on the same latitude and under similar technology and speed conditions, they would have arrived at the same time, same hour, and same day! What causes that difference? How could Peter and Paul fly and arrive at the same time at their destination?

Since Paul 's velocity would have to be greatly accelerated to compensate for the speed of the Earth, Paul's mass will have changed proportionately as per the Lorentz law of contraction. That new ***measure of change*** must be accounted for, and added into the

equation of both Peter's and Paul's space-travel. The ***space interval*** and the ***time interval*** are not the same in both cases. That is the elementary form of Einstein's revolution: space and time must be different depending on the observer and depending on the velocity of the body in motion. There is no absolute space or time. Time is no longer the steady river flowing under the floating phenomena, and space is no longer the banks of that river, independent of and separated from those same floating phenomena. Space and time are not "things in themselves." Space and time do not exist outside of the instruments we measure them with.

Moreover, imagine the following variation on the Poincare hypothesis that I would call the Early Riser's surprise. Imagine that last night you had a dream in which everything in the universe had doubled in size, including your measuring instruments. How would you be able to know the difference when you got up in the morning? You could not, could you? Because everything would still be the same, since everything changed simultaneously. But, what if during your patient investigation, you persisted in looking for a clue to prove that the change did occur, and suddenly, you discovered that a measuring rod and a clock, which should have also changed, had remained the same size as the day before? Would you not consider that anomaly as a sure sign that everything had truly changed during the night? Would that not be the proof of it? That measuring rod and that clock were the types of anomalies that Einstein was looking in order to establish his Theory of Relativity.

What happens to your mind when you relive Einstein's discovery of physical space-time is the same as in the physical geometric construction of the catenary and tractrix curves that I showed before in my Leonardo and Raphael reports. You must go through an inversion and you must change proportionately with the process of discovering it. It is that change of measure that makes you immortal! That is also the reason why I was perplexed with Lyn's report, because the difference between type ***'A'*** and type ***'B'*** had become a matter of mortality or immortality! That was the anomaly. You actually accomplish something in your mind that is impossible, because your mind has to go into a similar inversion in order to make that discovery.

In other words, space and time don't exist. It is the measuring instrument that creates space- time. As a result, you find that the absolute mechanical clock-time of type 'A' reduces man to an animal-like earth-bound mortal species, while the dynamic time-reversal of type 'B' transforms man into an immortal "people in space" species. Ovid's story of Alcyone and Ceyx taught me that. Thus, as soon as you leave the surface of the earth and take flight into space, the difference between space and time and space-time becomes a reflection of the difference between mortality and immortality for mankind. That was the urgent existential question of physical space-time that I found was implied everywhere throughout Lyn's paper. If man does not escape from what binds him to his planet to conquer space, he will die like an animal. That was the bone marrow I was looking for.

4- MONGE'S CAUSTIC AND THE SIMULTANEITY OF ETERNITY.

Let us begin to look at the ***measure of change*** as an interval of action. The important thing to measure, here, is the interval of action. But, the problem is that the idea of the lengths of space during certain periods of time breaks down with acceleration and deceleration, especially under the propagation of light at 186,000 miles a second. If I take a stationary measuring rod, I can easily consider that the rays of light at the two ends of the rod are simultaneous to my observation, but what happens when the rod starts moving in space and increases its velocity by hundreds of thousand of miles per seconds. That is what you can imagine was happening when Monge generated his "light" construction for the Catenary/Tractrix. The same measuring tangent rod is rotating in space while changing position from **AB**, to **CD**, to **EF**.

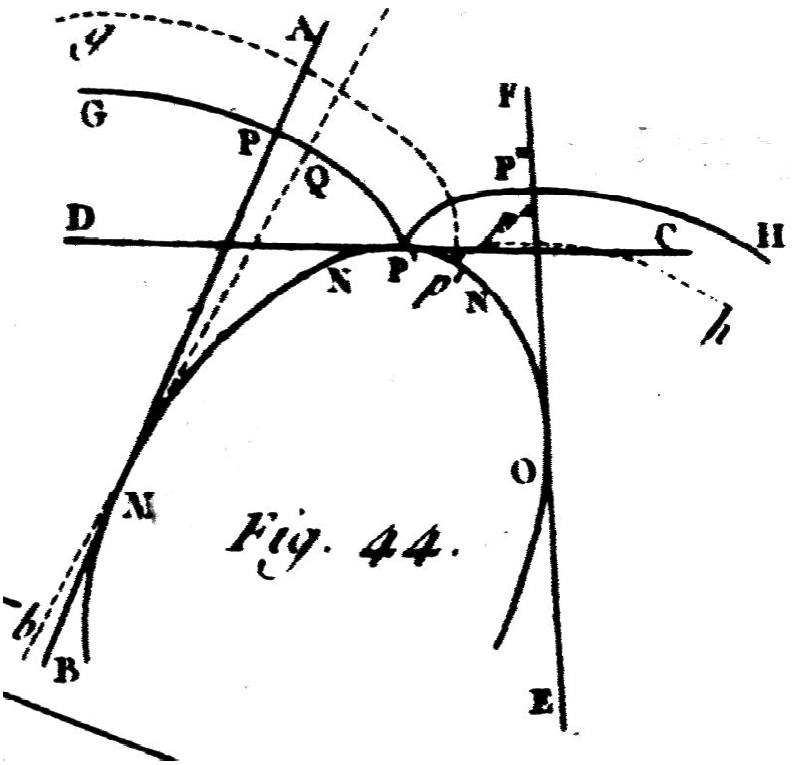


Figure 3. Gaspard Monge, The Catenary/Tractrix curves generating a caustic by means of a rotating tangent rod. Ecole Polytechnique, Class #8 March 31st 1795. Monge explicitly created his elementary constructions to provide students with a physical constructive method that would "guard them against the seduction of imposters of all sorts." (Bruno Belhoste et René Taton, ***L'Ecole Normale de l'An III, LECONS DE MATHEMATIQUES***, Dunod, Paris, 1992, p. 406)

Imagine that the two ends of a rod are no longer simultaneous because the measuring instrument begins to contract and increase in mass with respect to a fixed observer. Throughout an interval of change in space-time, the rod's shape becomes changed in accordance with the changes in velocities, and develops a series of interwoven envelopes of light similar to a multiple caustic. The Catenary/Tractrix relationship of those caustics offer good examples of this phenomenon of change in density of singularities, because they also generate sparks of creativity flashing in front of your mind's eye, as if through a glass darkly. Caustics can be reflected as in Figure 4.

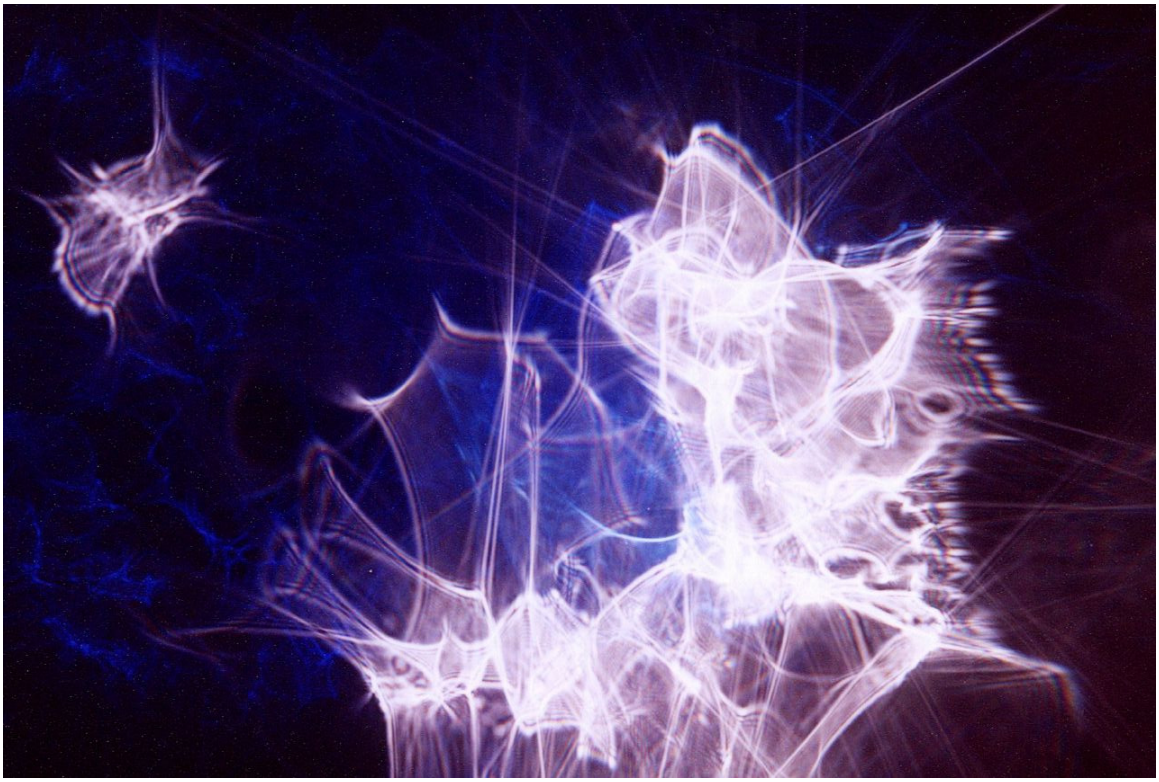


Figure 4. What can these caustics tell us about the ***measure of change*** in relativistic physical space-time?

This means that rigid objects no longer have absolute shapes or dimensions, in and of themselves; it is the ***interval of relations*** between their dimensions which is real with respect to the velocity of their motions. And, moreover, these ***intervals of relations*** are also relative among themselves. As a result, a square propelled at a great velocity will look like a rectangle, and a circle will appear as an ellipse. Furthermore, not only velocity, but also gravitational fields and magnetic fields will affect things in outer-space motion as Einstein demonstrated with the 1919 eclipse of the Sun. Thus, space and time are fundamentally dependent on each other.

Einstein added a time dimensionality to the three directions of space, which he called "the four-dimensional space-time continuum." That is a conception of space-time in which time is not a spatial extension of space, but a true time extension of spatial

dimensionalities. That Einsteinian notion, however, works only under somewhat restricted physical limitations. Nevertheless, in reality, the only true higher Riemannean dimensionality of relationship between time and space lies in what Lyn identified as the ***simultaneity of eternity***; that is, pertaining to the universal physical principles of the creative process which, as I have shown before, also apply to classical artistic compositions.

Without entering into the details of experimentation of Einstein's relativity of time in the simultaneity of two events for different observers, I just want to mention that it is necessary to consider that there are also other species of time to be considered with respect to Einstein's relativity, and which relate to the time of our consciousness and self-consciousness as a creative species. And, I am not talking about the time of sense perception that Henri Bergson talked about. For example, take the case of thinking what someone else is thinking, in the ***simultaneity of eternity***. There is a significant difference between thinking one thing at one time and thinking another thing just afterwards, on the one hand, and thinking of those two separate events at the same time, including the self-consciousness of all of those who are also thinking this same thing, simultaneously, from a higher level. In other words, the fact that two events may appear to precede one another and happen at the same time to different observers in physical space-time, or in consciousness, calls into existence the generating of a very real form of time that subsumes simultaneously both the relativity of physical space-time and the simultaneity of events of different times in multiply connected self-consciousness. Such a universally cognitive event of ***simultaneity of eternity*** was the reflective situation that Edgar Allen Poe had identified by the poetic formula: "***De te fabula narratur***!"

The simple expression of ***simultaneity of eternity*** may be captured when we are able to mentally visualize, for example, the time dilation of different stages of growth of a flower, from the time of its bulb planted in the soil of the Biosphere to the rising of its green bud, through the different phases of growth of its corolla, and to the falling petals of its final bloom, which are later transformed back into the Vernadsky fossilization of atomic transmutations in the Biosphere. The same process of ***simultaneity of eternity*** may be attributed to the different stages of development of a universal physical principle; as from the youthful enthusiasm of Pythagoras and Plato, to the blooming period of the adolescent Brunelleschi, Cusa, Leonardo, and Kepler contributions, until the more mature developments of Fermat, Leibniz, Gauss, and Riemann bring them into the full maturity of their final blooms with the wise old age contributions of Vernadsky and Einstein. That is the only true mental image of physical space-time where you can see in your own mind's eye the entire series of transformations of an entire creative process, simultaneously, and at any relative moments of its universal process; and that, at a faster rate than the speed of light. ***It is in that sense that simultaneity of eternity is the highest velocity in the universe, and that is the highest dimensionality from which you can observe change in space-time as in the case of measuring change in the domain of Einstein's Theory of Relativity.***

However, in science, some people think that you can arrive at the truth of things by adding one thing on top of another and measuring them. It doesn't quite work like

that. In space and time, we may be able to conceive of an invariant of things when they move with respect to one another, but all that we see is the shadow of a principle that is shaping the universe that only our minds can see. But, we don't see those principles. Nevertheless, this blind perception of our human condition should not be turned into a tribute to melancholy. This is not the road to despair. On the contrary, there is every reason to rejoice over such a limit condition. In fact, this condition is a glorious tribute to the nature of the human mind, which, created in the image of God, can joyfully see the truth "as if through a glass darkly." And this is a most joyful experience, when it is tasted with a sip of irony.

This condition should by no means be viewed as a handicap, but as a divine favor. In fact, God is granting us a wish to see a truth that others may never be so fortunate to discover. It is a great privilege to be able to understand that the true nature of the universe is metaphorical in character, for the simple reason that metaphor is the greatest shade protection against the blindness of the Sun. Seeing through a glass darkly is a God given opportunity to see something that is otherwise too powerful for our eyes to contemplate. This is the human condition, as Pope Jean Paul II ironically understood only too well when he declared: "Oh wonderful Sin that gave us such a Great Redeemer!"

5- EINSTEIN'S INTERVAL AND THE CATENARY/TRACTRIX.

In the two Nordmann books referenced in this report, ***The Tyranny of Time*** and ***Einstein and the Universe***, I have found sections where the author discussed the very exciting topic of the Einstein "***Interval***" and the question of the "***Invariant***" in relativistic physics. Nordmann appears to have closely related the two topics in an attempt to confirm Einstein's introduction of a higher Riemannean geometry into the domain of relativistic physics. This section is worth presenting here in its entirety. This is how Nordmann formulated his most important insight:

> "The distance in time and the distance in space of two given events which are close to each other both increase and decrease when the velocity of the observer decreases or increases. We have shown that. But an easy calculation – easy on account of the formula given previously to express the Lorentz-Fitzgerald contraction – shows that there is a constant relation between these concomitant variations of time and space. To be precise, the distance in time and the distance in space between two contiguous events are numerically to each other as the hypotenuse and another side of a rectangular triangle are to the third side, which remains invariable. [1]In the geometrical calculus or representation that may be substituted for this, the hypotenuse of the triangle is the distance in time, each second being represented by 300,000 kilometers.
>
> Taking this third side for base, the other two will describe, above it, a triangle more or less elevated according as to the velocity of the observer is more or less reduced. This fixed base of the triangle, of which the other two sides – the

spatial distance and the chronological distance – vary simultaneously with the velocity of the observer, is, therefore, a quantity independent of the velocity.

It is this quantity which Einstein has called the ***Interval*** of events. This '**Interval'** of things in four-dimensional space-time is a sort of conglomerate of space and time, an amalgam of the two. Its components may vary, but it remains itself invariable. It is the constant resultant of two changing vectors. The '**Interval**' of events, thus defined, gives us for the first time, according to Relativist physics, an impersonal representation of the universe. In the striking words of Minkowski, 'space and time are mere phantoms. All that exists in reality is a sort of intimate union of these entities.'

The sole reality accessible to man in the external world, the one really objective and impersonal thing, which is comprehensible, is the ***Einsteinian Interval*** as we have defined it. The ***Interval*** of events is to Relativists the sole perceptible part of the real. Apart from that, there is something, perhaps, but nothing that we can know.

Strange destiny of human thought! The principle of relativity has, in virtue of the discoveries of modern physics, spread its wings much farther than it did before, and has reached summits which were thought beyond the range of its soaring flight. Yet, it is to this we owe, perhaps, our first real perception of our weakness in regard to the world of sense, in regard to reality.

Einstein's system, of which we have now to see the constructive part, will disappear someday like the others, for in science there are merely theories with 'provisional titles,' never theories with 'definite titles.' Possibly that is the reason of its many victories. The idea of the ***Interval*** of things will, no doubt, survive all those changes. The science of the future must be built upon it. The bold structure of the science of our time rises upon it daily.

It must, in fine, be clearly understood that the ***Einsteinian Interval*** tells us nothing about the absolute, about things in themselves. It, like all others, shows us only relations between things. But the relations, which it discloses, seem to be real and unvarying. They share the degree of objective truth which classic science attributed, with, perhaps, unfounded assurance, to the chronological and special relations of phenomena. In the view of the new physics these were but false scales. The ***Einsteinian Interval*** alone shows us what can be known of reality." (***Einstein and the Universe***, p. 78-80)

The important thing, here, is not the calculus of this interval, but the insight that led Nordmann to establish this calculus. And, that insight says: when, the invariant side of a right triangle corresponds to the moving radius of a fixed circle, and the hypotenuse of the same triangle is the fixed vertical extension of the diameter of the same circle, the third side of the triangle falling at right angle to the radius of curvature is a tangent to that circle. This characterizes the thinking process of Euclid, or of what Lyn identified as the

type ***'A'*** personality, because the curvature of the circle is already given to sense perception as an expression of ***absolute space and time***. (See Figure 6, Euclid)

On the other hand, when the invariant side of the same right triangle corresponds by inversion to the tangent of a tractrix curve and the hypotenuse of the same triangle represents the time factor, the third side of the triangle falling at right angle to the tangent of the tractrix represents the space factor as an inversed tangent to the catenary curve. This thinking process characterizes the mindset of Leibniz, or what Lyn identified as the type ***'B'*** personality, because the ***invariant of space-time*** is understood in a single non-linear complex motion as something that, paradoxically, must also vary between two different curves that are not given to sense perception and have to be discovered in your mind. (See figure 6, Leibniz)

Although Nordmann may not have explicitly mentioned the catenary, he nonetheless developed this exciting hypothesis whereby the characteristic envelope-triangle, whose two rectangular sides are tangents to the catenary and the tractrix curves, are particularly suitable to establish ***space-time as a measure of change;*** the measure of change of space and time isochronically appropriate for Einstein's Theory of Relativity. However, there is more than space-time involved in Nordmann's insight.

The question of the ***invariant*** is not an easy thing to deal with, because it is the most imperceptible feature of a scientific truth. However, this ***invariant*** is not significant simply because you can repeatedly confirm the validity of the relativistic experiment and come up with the same result. It is significant precisely because it brings together the two pillars of Einstein's Theory of Relativity, space and time, into a continuum that becomes an absolute. Furthermore, Nordmann's use of the right triangle is very important because it exemplifies one of those rare moments in science when one is able to conceptually grasp a unity of effect that would otherwise not come together and become lost as a One of the Many that resolves the very long-standing paradox of Heraclites. In fact, it proves, as Lyn had been saying all along, that our Universe is non-entropic. Thus, by means of the Catenary/Tractrix principle, this Nordmann triangle also creates a unique ***variable invariant interval*** which brings together the Platonic Greek school and the Einsteinian Relativistic school of physics, for both of which time is conceived as the motion of a physical body and motion is nothing but space changing in time.

The Catenary/Tractrix principle also reflects a harmonically enveloping and developing measure as an expression of the finite yet unbounded principle of the universe, like the conglomerate of a physical space-time continuum which grows not only by a definite ***measure of change*** but also by ***changing the measure of change*** between space and time with respect to a universal physical principle. Here is how Einstein put it:

> "Just as it was consistent from the Newtonian standpoint to make both the statements, ***tempus est absolutum, spatium est absolutum***, so from the standpoint of the special Theory of Relativity we must say, ***continuum spatii et temporis est absolutum***. In this latter statement ***absolutum*** means not only 'physically real,' but also independent in its physical properties, having a physical effect, but not

itself influenced by physical conditions." (Albert Einstein, ***The Meaning of Relativity***, Princeton University Press, Princeton New Jersey, 1956, p. 55)

In other words, Einstein's Theory of Relativity is the resolution of the Heraclites paradox of absolute change, that is, where change is also subject to a change of measure. The Catenary/Tractrix also reflects this as the measuring rod of higher phase changes, especially changes in the domain of epistemology. What Einstein was looking for, as Kepler, Leibniz, Gauss, and Riemann also attempted to do before him, was more than looking for a ***measure of change*** in physical processes. He was looking for ***the principle that changed the measure of change,*** that is, the principle that would also change the observer along with physical space-time, not just account for him. This is the reason why the Theory of Relativity succeeds in accessing the absolute in a way that classical physics had failed to do. Relativity is an absolute without rigidity, a flexible absolute. Nordmann wrote:

"That is the profound reason why the Einsteinian '***Interval***' of things, the invariable quantity or "***Invariant***', must be the same for all observers whatever be their velocity, and in particular for observers moving at velocities equivalent, in a given place, to the effects of gravitation." (***The Tyranny of Time***, p. 170)

However, how would such a new ***change of measure*** of the ***interval*** relate to the question of the necessary ***invariant*** of scientific knowledge? The only way to check that is with the principle of irony. The change in the measure of space and time implies that any and all observers of a space-time interval must perceive the same invariant experiment of a crucial relativistic event, as for example, the curvature of light by the gravitation field of the Sun during the eclipse of 1919. Once that experiment became conclusive, the results were still relativistic, but in an absolute way. This is another way to say that the results of relativity experiments are absolutely true to the extent that they are based on nothing that is fixed. It is as if the ***Interval of phase change*** were constantly fluctuating on an ocean where the scientist can no longer anchor down and fasten his vessel to any solid geodetics.

Let us pose this problem differently. Imagine the case where an event is the same for three observers moving at different velocities, one at 100,000 kilometers an hour, the other at 50,000 kilometers an hour, and a third observer, moving at an accelerating velocity from the velocity of the second to the velocity of the first. Can all three observers account for the same invariant event in the same way? Isn't it the case that they could grasp the invariance of their relative situations only if their complex space-time ***invariant interval*** of action were to be measured against a fixed background of their three motions? How can the ***measure of change*** be otherwise? But, how can the event also be everywhere the same invariant without being absolute or privileged to a fourth observer? How can there not be a fixed external background to a group of relativistic velocities? If that is the case, isn't this the equivalent of reintroducing absolute space with a simultaneity of time under a relativistic disguise, or is this merely introducing a fourth observer who is relatively fixed only with respect to the first three? And where does the

scientist stand with respect to these four relativistic observations of the same ***invariant interval***?

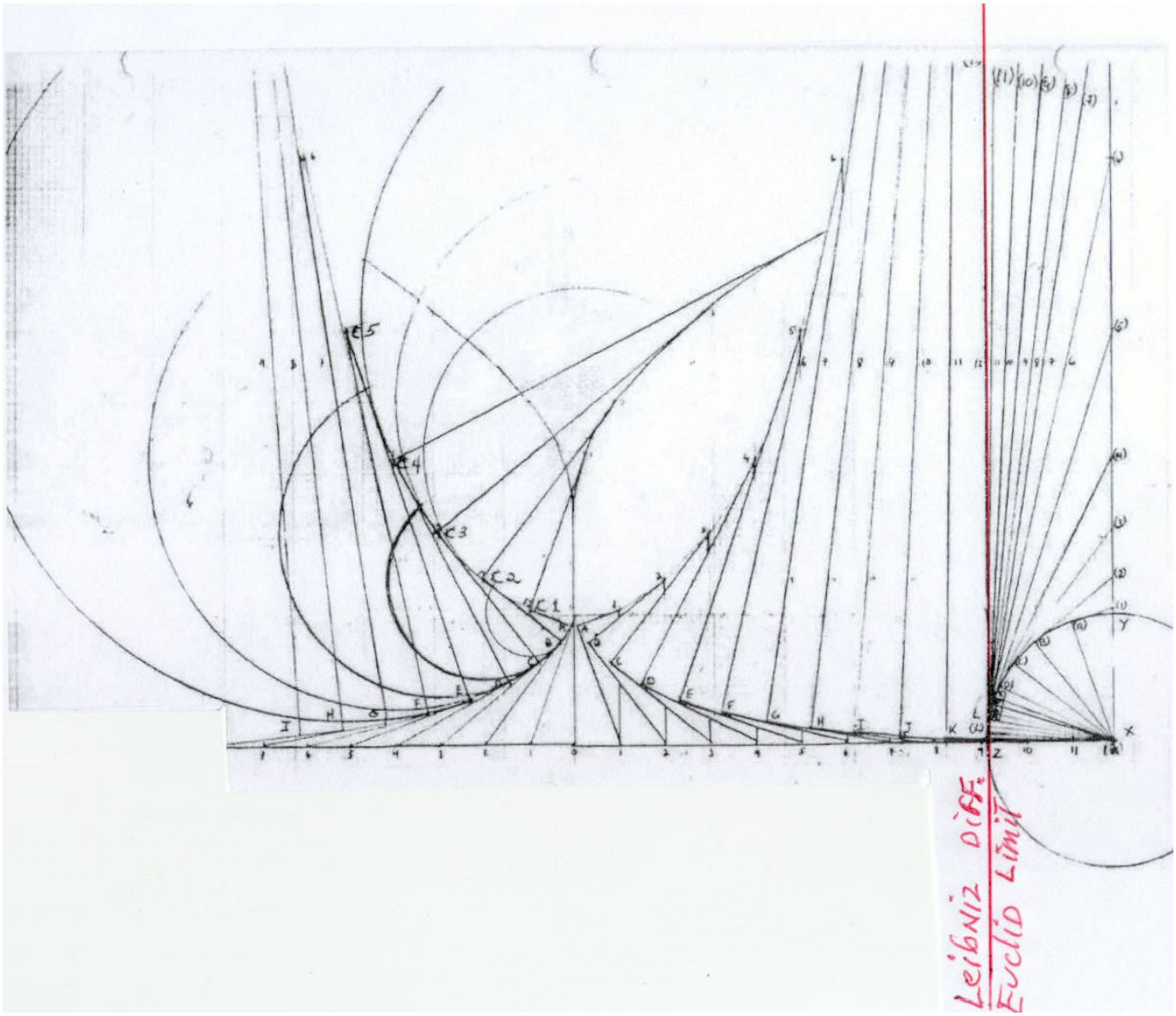


Figure 6. Catenary/Tractrix constructed with the Leibniz method of inversion of tangents. This is the double curve function of relativistic physical space-time. Note triangle A, 1, 1, triangle B, 2, 2, and triangle C, 3, 3, etc. Consider that one of the three sides of each rectangular triangle is invariant, while the other two sides vary as space does with respect to time. Then, you have a measuring instrument for changes in relativistic physical space-time.

The only answer to these questions has to be Riemannean in character; that is to say, that the invariant can be grasped by each of the first three, provided they also see

themselves as the scientist who sees the fourth observer observing them, but this invariant must be derived from a higher geometric manifold in order to measure what can only be detected as anomalies perceived from the relative standpoint of those different observations. Thus, the nature of this ***invariant interval*** must also consist, essentially, in breaking up the previous axiomatic chains by solving the inconsistencies of the anomalies and paradoxes that the ***Theory of Relativity*** confronted the first three observers with. If that is the equivalent of having a Socratic dialogue with oneself, then, the background nature of the ***invariant interval*** of the event must include the distinction between personality ***'B'*** and personality ***'A.'*** The best way to do this is by showing the difference between the formal geometry of the Euclidean treatment of the tangent to the circle as an expression of absolute space and time and the physical geometry of the Leibnizian construction of the Catenary/Tractrix by means of the inversion of tangents in relativistic physical space-time.

For example, in Figure 6, one side of the boundary condition of the hereditary circle (axiomatic red line) reflects type ***'A,'*** that is, the Euclidean type limited and chained to the ground by the absolute Aristotelian tyranny of sense-perception. In this case, given a circle and knowing that the property of a tangent is to be at right angle to the radius of curvature, it is very easy to find a tangent anywhere on that circle. However, the inverse proposition is extremely difficult when the curve is not given, because the difficulty is like Leibniz said: "***Given the property of the tangent, find the curve***."

This inversion of tangents reflects the personality of type ***'B,'*** that is Leibniz breaking the chains of earth-bound sense-certainty to make a creative leap over the apparent limitation of the imagination, upward to the stars, in order to discover the curvature that is not visible to sense-perception. The solution to a velocity equivalent of G-1 in traveling is to be found in the same manner. But, somewhere in the in the meantime and in the in-betweenness of this metamorphosis of space-time, something else has to give.

On the one side you have axioms, postulates, and definitions holding your nose down to the ground, and on the other side, you have a lift upward into space without the attachment of any ***a priori*** chains. On the one side, you have enslavement and mortality and, on the other, you have freedom and immortality. Thus, a crack in the window of passing between those two axiomatic conditions shows the unperceived presence of the universal physical principle of gravitation that controls the Catenary/Tractrix in physical space-time. However, what counts is not the size of the crack that shows that difference, but the fact that you cannot deny its existence.

Therefore, this ***measure of change*** is transformed to a higher level into a ***change of measure,*** such that man becomes the ***change of measure in the measure of change.*** By going through such an inversion, this universal Catenary/Tractrix principle does not merely express the interval of change between space and time, it also expresses an axiomatic jump between the two forms of epistemological states that characterizes the difference between type ***'A'*** and type ***'B'*** personalities. However, this Catenary/Tractrix principle is not affected by such changes.

Moreover, the characteristic triangle also expresses the shadow of a constant unvarying tension between the two incompatible states of mind of Plato and Aristotle, as identified in Raphael's ***The School of Athens***, and it is in that last acceptation that the ***measure of change*** reflects the issue of life and death for the human species as a whole by highlighting the need for creativity. This is why discovering the tangent to a circle does not require creativity; but discovering a physical curve by inversion of a tangent does.

In a nutshell, the Catenary/Tractrix principle characterizes whether man will be able to leave this home planet of Earth and become immortal by traveling throughout the universe, under the Noospherical ***1-G*** condition of acceleration and deceleration (Einstein's principle of equivalence), or will become confined to its surface as a prisoner of axiomatic assumptions and die, like all other animal species that remain stuck in the mud of the Biosphere. Indeed, since gravitation and acceleration cannot be distinguished and the laws of an acceleration system are the equivalent of those of a uniform gravitational field, one merely has to discover a thought experiment in which one case is the inversion of the other. This is the reason why one must break away from the formal geometry of Euclid in order to show how important the limitations and progress of the human mind are with respect to the Catenary/Tractrix principle as a litmus test. The choice is between being creative or not creative.

Finally, think of this process as a ***change expressing the measure of change in the simultaneity of eternity*** which includes the three following crucial ideas: 1) the idea of Cusa's theological paradox of a contracted infinite; that is to say, the point of an axiomatic change and paradoxical coincidence between a ***maximum and a minimum***; 2) the idea of the ***Einsteinian Interval*** between space and time expressing a phenomenon of increasing density of singularities in physical space-time, very similar to axiomatic changes in classical music; and 3) the idea of an epistemological ***change of measure*** by inversion between Leibniz and Euclid, as the expression of an axiomatic change of the observer passing from a type ***'A'*** to a type ***'B'*** personality as Lyn had identified, and as Raphael illustrated in ***The School of Athens***.

Thus, you have the envelope of a Catenary/Tractrix motion expressing the simultaneity of eternity between a minimum-maximum principle, a boundary condition of dense singularities with respect to the speed of light, and the axiomatic change of the creative process, all rolled up in one. Working through this crucial exercise represents one of those rare moments when the cup of hypothesis reaches the lips of experimentation and gives you a taste of one of the greatest millésime blend of science and artistic composition ever to be harvested from the fields of human history.

CONCLUSION

Einstein's ***Interval*** represents the measure of what he called "the space-time continuum" as the only absolute; that is to say, absolute in the sense of Heraclites when

he said: “everything changes, except change itself.” However, the principle governing this ***Interval*** is not, itself, something that you can measure, because it pertains to the formation of the universe itself, which measures everything else without being, itself, measured. As Lyn put it: “So, a principle is not something you measure as an interaction, like a physical interaction among objects. A principle is a ***shape of the universe***: an efficient shape of the universe, which controls the way objects move, ***move within the universe!*** Dynamics does not lie in the interrelationship of the moving parts. It lies in that which ***controls*** the motion of the parts. As gravitation does, as Einstein defined it. Universal gravitation ***lies outside*** the motion.” (Lyn, ***NEC Meeting for Tuesday, November 17, 2009***)

Therefore, from the vantage point of three thousand years of scientific history, Einstein’s so-called measuring rod $E = MC^2$ is not a mathematical equation at all. It is an irony expressing how long it takes a human being to resolve the Heraclites paradox of absolute change. In other words, the sign of equality does not express the equivalence of two states of matter, but, most emphatically, it shows that one state of matter is changed into another state of matter. And again, it is not so much the difference in the amount of change that counts, as it is the fact that such a change exists at all.

In that sense, the sign of equality = does not represent a mathematical equality but an ***absolute change of measure,*** the new measure of the Theory of Relativity itself. This means that all of mankind has to go through an axiomatic phase change, as if it no longer had a choice but to grow up from adolescence to a matured humanity. Here, the Einstein formula expresses the universal irony by means of which the purpose of everything in the universe was to change from one state into another, a sort of perpetual Pythagorean metempsychosis, as Ovid replicated in his ***Metamorphoses***. That is the irony which defines the new science of physics at any moment, at any level of observation, and for any phenomenon. Thus, matter ***M*** is transformed into energy ***E*** by virtue of the same principle that generates ironies in classical artistic composition. But the question is: what sort of measure did Einstein use to provoke the epistemological change from a type ***‘A’*** to a type ***‘B’*** personality? One answer may be found in Figure 7.

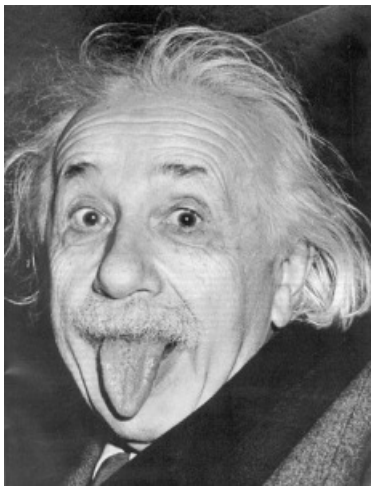


Figure 7. Albert Einstein (1879-1955) Photo taken by UPI photographer Arthur Sasse on Einstein's 72nd birthday. After smiling all day for the cameras, Einstein got tired and decided to display this measure of irony for the UPI photographer. It could as well have been Einstein's way of answering the question: "How long does it take to understand the change of measure of relativity?"

Thus, ***the change in the measure of change*** becomes the key to the difference between being limited and earth-bound, as a type ***'A'***, and being freed to travel in space-time, as a type ***'B'***. Unless we begin to use this LaRouche ***change in the measure of change*** soon, the human species will die just like all other animal species do; but, contrary to other animal species, our governments will euthanize us under the guise of saving us from a fate worse than death, and we might not even be able to tell that difference, because the change might not be perceived, as if you had been reduced in size overnight.

The point is that, the sooner we understand the necessity of breaking free from the Aristotelian-Euclidean ***a priori*** clock-time shackles of the Biosphere to raise ourselves under the dynamics of the time-reversal physical space-time of the Platonic Noosphere, the sooner we will have secured the immortality of our species. Similarly, the study of Vernadsky's approach of time for cosmochemical, geochemical, or biochemical clocks still also remains to be investigated from the vantage point of the higher epistemological Catenary/Tractrix principle of the Noosphere. Next, reflect this back to the space-time of the ***Crab Nebula*** and ask yourself: what is the velocity range of its Catenary/Tractrix in the simultaneity of eternity, and how does that affect the future of our planet?

From that standpoint of immortality, however, it is not our own personal immortality that is of interest, but the immortality of the species that each of us, individually, has the responsibility to secure. So, the question is: are we going to act responsibly and lead those members of our species who are ready to understand what this new economic science is all about? The next question is, at this point: what lies beyond the range of the soaring flight of this Catenary/Tractrix? And, are you willing to risk the difficult leap to reach it?

FIN