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COMMENTARY

SUPERNOVAE FROM EXPERIMENTATION ?

PAUL W. DIXON

College of Arts and Sciences, University of Hawaii at Hilo, Hawaii 96720, U.S.A.

ABSTRACT

Whereas, quantum tunnelling towards de Sitter space is unlikely in one Hubble space-time volume, the penetrance of the potential barrier between de Sitter space and the continuum in a classical sense, is only a function of energy. The final evolutionary stage of collapse of stars having ten or more solar masses, may initiate this transition. The presence of active galacttic nuclei, B L Lacertae objects and quasars, where these are found to be monopolar and are observed to be 4 to 5 times larger than bipolar objects, are also seen as intrusional events from de Sitter space in this postulation. Where natural phenomena may cause a transition towards de Sitter space, it may be possible to cause these same effects with high-energy physics experimentation. Supernovae (SN) Type Ia evidence some 2.5 times greater luminosity than SN Type II, yet originate from objects of approximately one solar mass and show no trace of hydrogen near maximum light. If we are not the only sentient entities extant in the potentially infinite reaches of space and time, and with increased evidence of planetary bodies circling other statrs, is the generation of SN Type Ia evidence for high-energy physics experimentation on other planetary bodies ?

The article entitled "Supernova 1987A!" which was published in the journal *Science* on the 6th of May 1988 presents many of the difficulties found in the current model of supernovae production. Mention is made of the problem found with computer models in providing adequate core bounce phenomena. The reflection of the energy of the imploding star never has quite enough energy to come back from a neutron star, black hole or other highly condensate object with the energy observed in the supernova. For those familiar with this vast literature, it may be observed that the findings support one position and then another over time.

The "Mysterious Companion" is also mentioned. This is a unipolar relativistic jet phenomenon according to Martin Rees (1987) and other authorities. Here also there seems to be no general agreement as to the origin of this phenomenon (1988). A similar "jet" showing faint radio and emission lines is found projecting from the northern boundary of the Crab nebula (here called the "stern") which appears as a neat right cylinder which is lengthening and expanding (Marrison and Roberts, 1985). This stem is part of the supernova remnant.

We may also examine the findings concerned with superluminal flux (Pauliny-Toth, *et al.*, 1987) neighbouring SN1987A and quasars and (Suntzeff *et al.*, 1988) energetics of quasar formation as well as the phenomena of unipolar relativistic jet phenomena[5] from both quasars and also the larger Seyfert galaxies as related phenomena. It is clear that the source of these very large unipolar events is qualitatively different from that of the smaller bipolar events. These less energetic objects may then be due to high-temperature accretion discs around black holes. pulsars, or other similar objects (Wills, 1985).

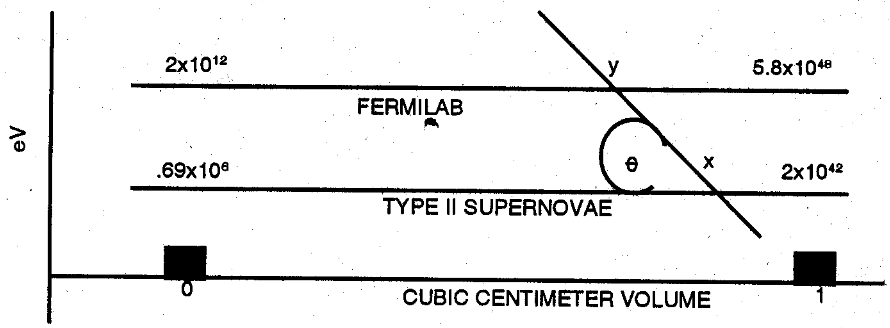
The formation of a breach in the potential barrier towards de Sitter space may account for these larger events. given the highly energetic nature of de Sitter space. (Gatt, 1982). The only divergence from this generally plausible understanding lies in the largest of all supernovae. These are the Type Ia which are of about one solar mass, yet are two to three times larger than the Type II supernovae which are greater by a factor of ten or more in initial mass. In this latter instance mass conversion equations do not yield the deflagration of some trillion or so solar masses as observed in Type 1a supernovae. Deflagration can be explained by the postulation of the generation of supernovae from an aperture of a certain dimension towards de Sitter space.

The current model of Type Ia supernovae formation invokes the accretion of matter onto a white dwarf or similar object within a binary star system. Interestingly, however, there is no sign of hydrogen near maximum light for Type Ia supernovae. (Takahashi, 1986) Hence, in all cases, the other member of the binary star system would not be of the typical hydrogen dominant composition. This supositioh would,therefore, not have great statistical likelihood.

Where it is postualted that the increased luminosity of Type 1a is due to radioative decay of 56Ni to 56Co, (woosely and weaver 1986) the photometrically derived light curve for the elements should show increased luminosity for these species. The elevated pattern of spectral luminosities show for SN 1981B (Type Ia) for all the elements of its compostion (Wheeler & Harkness 1987) demonstrates an overall general increase in energetics compared with the other types of supernovae. It has also been observed that type Ia (to use the recent typology) have homogenous spectra with relatively little variation between the spectra of one and that of the next. The light curves are also distinctly different. The Type Ia supernovae show a steep decline followed by an almost perfect exponential decay extending for some 700 days or so. The light curve of Type II supernovae, for example SN1970g, show a much more complex pattern with visibility extending to approximately 250 days. (Krishner, 1976).

It is therefore significant to inquire as to what further mechanism would generate sufficient energy to breach the potential barrier towards de Sitter space yet have the smaller initial mass found in supernovae Type Ia, in order to provide the vast flux of energies observed. Since the size of the aperture to de Sitter space will not suffice to explain the difference in size between supernovae Type Ia and Type II, it may very will be that special conditions such as experimentation by sentient entitites much like ourselves may account for these phenomenon. (Rees & Stoneham, 1985) note Figure 1.

Historically, to speculate in this way has led to the classic instance of Friar Giodorno Bruno, 1548-1600, who was burnt at the stake for his postulating that space was infinite and there were innumerable inhabited worlds (Michel & Maddison 1973) Progress from the time of this greatest and most famous of the philosophers of the Italian Renaissance to the present, must leave some residue of this early geocentric and anthropocentric bias. We may then in this enlightened era move towards a more universal doctrine of the cosmological ubiquity of life and particularly life which can produce technological development, much as we have done in the last century. In this



way we support the general principles of Darwinian and general evolutionary theory which postulate the formation of life from genetic as well as chemical origins.

Conceptually we may imagine a number of experiments which we may term Experimentum Secundus, which are of the same description as experiments of the first type yet with the additional characteristic that there are no survivors thereafterwards to observe the results of the experiment. The experiment in progress at the Chernobyl reactor at the time of the accident would be considered an excellent prototype of this kind of experiment. Surely the time has come to carefully consider the possible consequences of constructing ever larger accelerators. (correspondence; Lindley, 1989)

The vast energetics of supernovae Type Ia having origin in approximately one solar mass objects, culd have a different source, i.e., an intrusional event from de Sitter space owing to their presence in all types of galactic milieu, the flux of energies produded over a greater time period, and the absence of hydrogen near maximum light.

The reappearance of the "mysterious companion" now seen some two light weeks from SN187A would suggest some additional source of energetics, However. Astronomers from the Harvard-Smithsonian Center for Astrophysics have detected the object still showing one-twentieth the flux level of the generating supernova. Since this object shows a luminous flux of 5 million solar masses and has one-third the velocity of light, the ejecta from this supernova may have origination in de Sitter space. The marked asymmetry of the envelope of SN1987A. with ratio between minor and major axis of about 2-3, would further indicate a distortion of the envelope due to sources other than pulsar. Of futher note according to Costas Papilioloa and other members of the Harvard-Smithsonian team, is that the major axis of SN1987 is alighed with the postion angle of the companion to the supernova (Papaliolos *et al.*, 1989).

The observed velocity of pulsars ranging to 500 km per second and above is difficult to account for within the symmetrical collapse of the progenitor star or due to the emission of asymmetric magetic dipole or neutrino (Pskorsky & Dorofeev, 1989) radiation. There is no immediately plausible monopolar mechanism which would permit these large velocities. It may be postulated, however, that the intrusional event from de Sitter space may impinge upon the continuum from any point on the surface of the unit sphere. Since this would include all possible directions, both towards and away from the newly formed pulsar, we may assume that the back scatter of this vast flux of energies would have an acclelerative effect on the pulsar as well as imparting to the sphere a large rotational velocity and /or oscillatory motion associated with the direction of thrust. Clearly in those instances where the ejectal force from de Sitter space is launched towards the pulsar, the impact would fragment the newly formed spheroid. It would, therefore, be predicted in accordance with this theory that not all supernova remnants would have a surviving pulsar, since supernova generation may destroy the pulsar due to the energetics of deflagration. So far, no pulsar has been detected resulting from SN1987A.

This work therefore is concerned with the novel hypothesis of an intrusional event from de Sitter space as an alternative hypothesis to the "central machine" accretion disk orbiting a supermassive (10^8-10^9 solar masses) black hole model of Martin Rees.

The observational indices of blazars, optically violent variables seen at normal quasar redshifts, which term is taken here as including B L Lacertae objects, and those quasars which exhibit highly polarized strong emission line spectra are seen to have no characteristic form of blazar variability. Also the spectral index parameters appear to be consistent with relativistic shocks and synchrotron losses. Thus the model is that of a quiescent jet and the cut-off effects being due to shock acceleration in flow (Ballard *et al.*, 1990). An observation of blazar intensity having been found to be in one instance an increment of some ten million solar luminosities in one second's duration.

"This suggests an inhomogeneous model for the emission region is required. An example is provided by a polarized component with a high-frequency cut-of and second component with a steeper spectral index and no significant polarization, tentatively identified with shock accelerated electrons and a quiescent jet, respectively."

It is clear that where the fluxional energetics of the quasar may equal the continuous output of 100 million galaxies with the shock parameter providing additional variation to this output with energetics having variability in the million solar luminosity range, mass conversion equations do not suffice. In other words, more energy is needed. This alternative model must also provide for the finding of increments in luminosity of a quasar sample of.25 magnitude over a seven year observational period (Cristiani, & Andreani, 1990). As stated herein, the model put forward by Martin Rees, "though suggestive, is obscure in its fundamental structure and lacks a direct observational confirmation."

It may be noted in this connection that a radiative acceleration of gas to .10c may be account for broad-adsorbtion-lines in queasars. This mechanism, it is concluded, may serve as an important dynamical process in quasars in general (Perry, 1986; Arav *et al.* 1995).

The general model of universe formation is conceived of as a black hole which has formed in de Sitter space. Topologically, each point in our universe neigbours de Sitter space, though direct penetrance into the continuum is prevented by a large potential barrier.[19] It is, therefore, following this will known postulation of Willen de Sitter, that it is hypothesized that the greater, unipolar phenomena such as Type I and II supernovae, BL Lacertae objects and Quasars and also transitionally highly energetic phenomena at the center of this galaxy and other similar galaxies, are instances of a breaching of the potential barrier towards de Sitter space. This position is also brought forward by Martin Elvis,[21] who states, "One of the assumptions must be wrong. Either the gas densities are a higher and the C III emission comes from somewhere else; the ionization parameter is large, which would make extra difficulties with the line rations; or there is a special geometry in the nucleus so that, for example, the gas does not see the same continuum as we do." In conclusion he states, "On the other hand, as the emission-line problem has turned out to be so intractable, researchers are now looking for extra sources of energy in quasars."

The model used in my analysis is that of Erez Braun and Mordehai Milgrom (1990). This position is called the Variable Ejection Wind Model (VEW) which has the point of origination in a varying continuum. In this conception, "the variability occurs at ejection (i.e., with variable mass and energy output) the flow being terminal from there on . . ." In my postulation the gas intrudes as an energy flux in a monoplar jet from the false de Sitter vacuum. Conformal changes via the geometry of the continuum transform this flux into elements of this continuum in a kind of crystallization effect. Braun and Milgrom (1990) conclude that, "disk or jet-like geometries are not excluded by the observational data. . . " Actually, some authors prefer nonspherical geometries as a conclusion resulting from models of resonance-line scattering (e.g., Turnshek 1988) and the fact that multiple troughs are sometimes observed One finds for de Sitter space:

$$\frac{1}{2}\left[\frac{1}{\beta_5}+\frac{1}{\beta_0}\right]\sigma\ddot{r} = -\frac{\beta_0+\beta_5}{r}-\frac{G\,M}{2\beta_5 r^2}+\frac{\sigma x r}{2\beta_0}-p_0$$

In the nonrelativistic limit, the terms on the right hand of the equation are the surface tension, the gravitational attraction, the de Sitter repulsion, and the pressure difference, respectively.

Several paradoxes must be considered in this connection. The first paradox concerning the volume of the de Sitter vacuum is resolved when we consider its unusual geometric structure. The false-vacuum of de Sitter space inflates as expected, yet does not move out into the true vacuum region. In fact the domain wall is constantly accelerating towards the false-vacuum region, but the false-vacuum region is inflating so rapidly that the motion of the wall does not prevent it from expanding exponentially (Blan & Guendel man and Geeth, 1987).

Penetrance through the domain wall permits the rapid emergence of an exploding universe into the true vacuum region, with its time vector, I, also expanding exponentially until the momentum is adsorbed within the ture vacuum region. In quasar energetics, with the continuous extrusion of the energies of 100 million galaxies for some billions of years, this may indicate that it is possible to produce a more permanent rent in the domain wall than is seen in the more transitory perforations found in Supernovae Type Ia. In this way, those difficulties found in accounting for these vast energies would have a ready explanation in the unique properties of the false-vacuum conditions of de Sitter space.

The observational evidence reveals the uniform presence of monopolar jets from quasars. These objects are four to five times larger than the bipolar objects. Where the fluxional energetics of these variables is measured in millions of galaxies of luminosity, it would appear plausible to assume that there is a unique and different source of energetics for these larger variables (i.e., de Sitter space) since there is a dichotomous distinction) between Class I and Class II objects (Burns, 1990).

The energetics of supernovae Type Ia, which are of approximately one solar mass, and yet 2.5 times greater in magnitiude than Type II supernovae of some 10 solar masses or greater, should then result from a small though highly energetic flux's reading of a more highly energetic region in the continuum of the false de Sitter vacuum. The postulation of intrusional events from other, more highly energetic continnua, is not excluded from this analysis.

Should we consider the observations of quasars and related objects as offering a window into the primordial region of de Sitter space, it would appear, perhaps as expected, that this is a region of intense turbulence, of storm-like aspect, which may upon occasion form a condensation that is universe formation. The decay of universe rotation through shear effects due to the topological embeddedness of the continuum in de Sitter space is seen in Oyvind Gron & Harald H. Soleng[25]. It may then be in error to presume that de Sitter space is a static creation of invariant action but may instead be, according to these observations, a region of dynamic action and hence interaction with the continuum.

Commonsense tells us that as we continue to probe towards energies observed some trillionths of a second subsequently to the origin of this universe, we may enter into dimensional energetics intrinsic to the Einstein de Sitter Universe.

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