Cosmology and physics

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ABSTRACT. Observations of extragalactic objects show that their redshifts are a function of their age rather than their velocity of recession. This necessitates a non Big Bang solution for the behavior of the Universe. Unlike Theory of Relativity (TR) treatments, the new solutions require flat (Euclidean) space, a primary reference frame and both a universal time as well as individual object times. Recent analyses of local physics indicate these same properties can be used to satisfy classical TR experiments. It is argued that simple, non-mathematical reasoning needs these properties for new solutions and rules out the customary TR assumptions. The century long dominance of fundamentally inadequate physics would seem to be due to an uncritical feedback between Academia and the news media.

Key words: quasars, redshifts, flat space, relativity, mass.

RESUMO. Cosmologia e física. Observações de objetos extragaláticos mostram que seus desvios para o vermelho são uma função de suas idades ao invés de suas velocidades de recessão. Para tanto não é necessária uma solução do tipo "Big Bang" para compreender o comportamento do Universo. Tratamentos distintos da teoria da relatividade (TR), as novas soluções requerem um espaço plano (Euclideano), um sistema de referência primário e, ambos, um tempo universal como também tempos de objetos individuais. Recentes análises da física local indicam que estas mesmas propriedades podem ser usadas para satisfazer experiências clássicas de TR.. É discutido que um raciocínio simples e não matemático requer estas propriedades para as novas soluções e regras fora das suposições habituais da TR. A extensa dominação, através do século, de uma física fundamentalmente inadequada parece que se deveu a uma avaliação não crítica da relação entre a Academia e a mídia.

Palavras-chave: quasares, desvios para o vermelho, espaço plano, relatividade, massa.

Starting from 1966 it has become increasingly clear that high redshift objects are physically associated with disturbed, low redshift galaxies. An empirical sequence of birth of high redshift quasars in the nucleus of a parent galaxy, their ejection and subsequent evolution into lower redshift quasars and then into somewhat higher redshift companion galaxies can be demonstrated. Observationally this is how new galaxies are being created. But the fact that their redshifts are intrinsic and decrease with time will be argued here as invalidating the entire, conventional relativistic physics. Therefore extraordinary observational proof is required. A sample of some of the high probability associations is shown in Figures 1-3. Detailed accounts of the full evidence may be referenced in the book "Seeing Red: Redshifts, Cosmology and Academic Science" (Arp, 1998).

To summarize the observational situation, there is ample evidence that energetic nuclei eject matter. Quasars, along with galaxy clusters tend to be strong X-ray and radio emitters like the nuclei of large, active galaxies from which they originate. The ejected objects, however, are isolated compact energy condensations and cannot persist in their present form for a long duration of time. Therefore, it is established that these high redshift objects are young. Their redshifts diminish as they travel outward and evolve into more normal galaxies.

The new cosmological theory

In 1977 Narlikar and in 1993 Narlikar and Arp showed that the conventional Friedmann solution of the field equations of relativity yielded a more general solution if particle masses were allowed to be a function of time. This yielded a simple solution

where particle masses, and therefore spectral shifts, varied with age since creation (t):

$$m \propto t^2 \propto (1 + z)^{-1}$$

This solution is in flat (Euclidean) space where the $G_{\mu v}$ terms are $= 0$ in the famous:

$$G_{\mu v} = T_{\mu v}.$$

At first, we considered it a much needed validation of the variable mass theory of redshifts, that it was an actual solution of the greatly honored Einstein equations. Slowly I have now come to the opinion that the Riemannian space curvature terms on the geometric "field" side of the TR equation were only a complicated, non-physical way of fitting the observations that resulted from the real, but ignored variations of the mass, m=m(t). In fact I have come to view the equation

$$0 = T_{\mu v}$$

as a tautological conservation of momentum/energy which destroys the basis of TR.

Moreover, since particles could be created at any time, their clock rates ran on various time scales (τ) which, as they aged, speeded up, gradually approaching the universal time scale (t). Because of this universal time scale, a primary reference frame was implied (another anathema to relativity theory). Singularities involving infinities, such as black holes, do not exist in the new solutions because they become creation events (white holes). It is the emergence of matter from mass/energy concentrations which in fact is actually observed.

The most fundamental change of concept which the non-velocity redshifts have initiated is the nature of mass. Here the mass of an electron, for instance, depends on the number of particles with which it has communicated. As its signal horizon expands (at velocity c) its mass increases, the photon emitted in an atomic transition increases in energy and its redshift decreases with time. For galaxies all created at the same time, redshifts increase as we look back in time to the more distant galaxies - exactly as in the relation observed by Hubble. But this is a Machian universe which Einstein regretted never having been able to achieve.

As a further comment, the "dark" or "missing" matter is eliminated as a problem because galaxy masses judged from redshift dispersions are no longer so large. The last bastion of dark matter, the

flat rotation curves of spiral galaxies, are better fitted by Milgron - Sanders - McGonough models (see Sellwood and Kosowsky 2000 for latest references). I personally suspect a "pushing" sea of much faster than light gravitons as advocated by Le Sage and Van Flandern is the explanation for gravity. This model is possibly now forced by the elimination of the conventional curved space-time explanation of gravity which, in any case, was impossible to unify with electromagnetism in TR

Proper time for local physics

Led by investigations of Tepper Gill and Hans Montanus (1999), among others, a new way of treating classical physics problems is evolving. It is called proper time physics because there are two time scales, t, the universal time and the different τ time scales for many different objects. It takes place in flat (Euclidean) space with a preferred reference frame. As the summary Table 1 shows, these essential properties are exactly the same as in the Narlikar-Arp variable mass cosmological solution. The m(t) properties do not come into the traditional local physics problems because the creation epoch of the dominant material is the same. But on the cosmological scale the effects of different creation epochs are enormous (and lead to the *reductio ad absurdum* of the Big Bang). It is very attractive, some might even say mandatory, to have at present the same physics applied to phenomena on all scales.
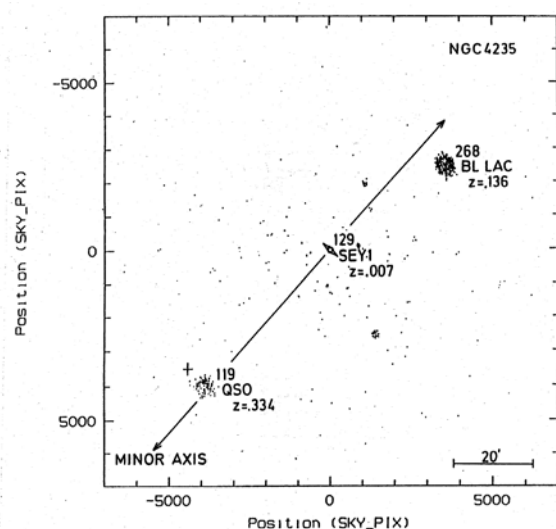

Figure 1. A field pictured in X-rays showing a pair of quasars (redshits = z = .334 and .136) aligned along the minor axis of the active Seyfert galaxy NGC4235 (from Arp 1997)
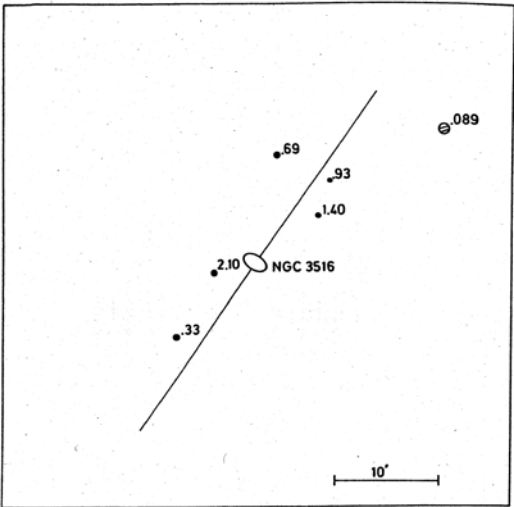
Figure 2. Six quasars ejected out along the minor axis of the active Seyfert galaxy NGC3516. The chance is about one in a million of accident configuration. The redshifts diminish with increasing distance from the galaxy and also fall close to quantized values of redshift which quasars obey. The discovery was rejected by Nature Magazine (from Chu *et al*. 1998)
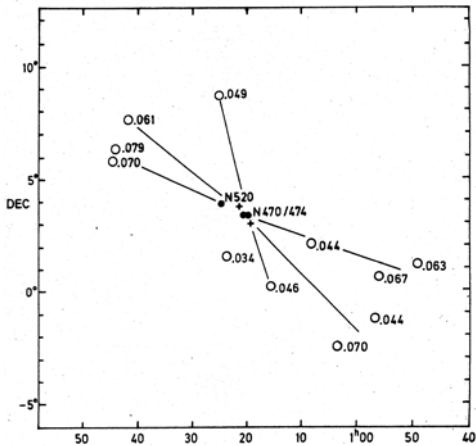

Figure 3. Plus signs locate two very bright radio quasars paired across a bright, disturbed pair of galaxies. The chance of this configuration being accidental is about one in a billion! Further out the quasars have diminished in redshift and split up into clusters of galaxies as indicated by the open circles (from H. Arp and D. Russel, *Origin of clusters of galaxies*, ApJ submitted)
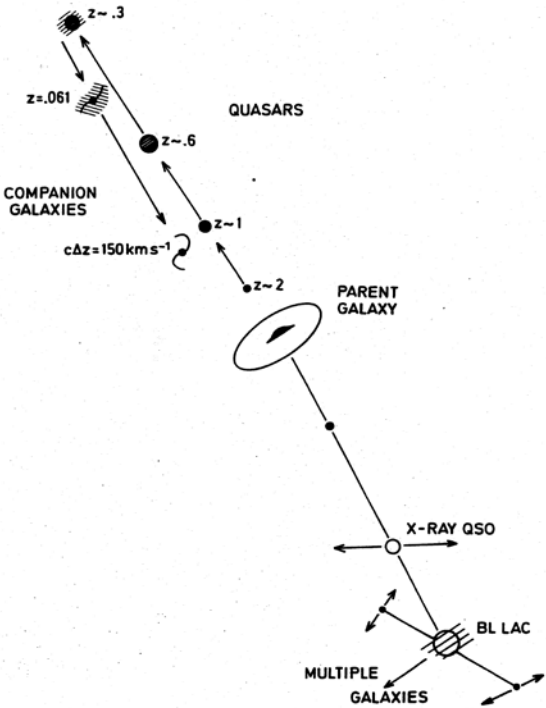

Figure 4. Schematic representation of quasars and companion galaxies found associated with central galaxies from 1966 to present. The progression of characteristics is empirical, but it is also required by the variable particle mass theory applied to galaxy creation by Narlikar and Arp (1993). The diagram is from H. Arp (1998)

In the last column of Table 1 I have listed, in abbreviated form, logical refutations of the relativistic tenets - refutations that require no mathematics or expert knowledge. (It is a pleasure to acknowledge Tom Van Flandern (2000) which reference I have paraphrased for many of the entries.) There is a growing number of independent researchers who are now making specific analyses of TR and finding rigorous disproofs, in its own language, of various TR assumptions. I have listed just a few of them at the bottom of the proper time column in Table 1.

Table 1. Some of the most important concepts in modern physics and cosmology are listed in the first column. The next three columns show whether variable mass, proper time or TR physics support or violate these concepts. The last column gives the common sense (operational definition) of the concepts. Finally, at the bottom of the columns are a few of the names associated with the three analytical systems

Concept	Var. mass	Proper time	Relativistic	Common sense
primary reference frame	✓	✓	X	Aver. over detection = reference
flat (Euclidean) space	✓	✓	X	Space defined as direction
universal & local time	✓	✓	X	Clocks run fast and slow
no singularities (black holes)	✓	✓	X	Finite does not go infinite
no fields (action at distance)	✓	✓	X	Causality
$mass \neq f(v)$		✓	X	$m \not\to \infty$ as $v \Rightarrow c$
$mass = f(t)$	✓		X	Mach, e. m. speed = c
no dark matter	✓		X	High redshifts not velocity
no Big Bang, expansion of space or faster than light inflation	✓		X	Something cannot come from nothing, space cannot expand
	cosmological	terrestrial	historical	
	Hoyle	Van Flandern Phipps, Gill	Einstein	
	Narlikar	Seleri, Drew Montanus	Academia	
	Arp	Galeczki	Media	

Probably many of these independent researchers have wondered whether Academia is a doomed institution. Has 800 years of uncritical approval and acceptance led to senescence? Has a self-serving feedback loop between academia and the news media convinced the two parties that fundamental assumptions can never be questioned?

What is to be done? Press with logic and insistence on both estates? Of course! Press ahead with independent research and mutual support from all such researchers. Of course! It is my hope that by putting forth the candid thoughts of this paper, we may use each other's results and concepts to unify science on all scales, and across all disciplines, in a way that will lead to more fruitful discussions and understandings in the future.

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