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6/92

Gamma-Ray Bursters: Another Scenario

Your excellent news story "Compton Observatory Data Deepen the Gamma-Ray Burster Mystery" (February 1992, page 21) is thorough but not quite complete. I have proposed another cosmological speculation to explain gamma-ray bursters in a paper entitled "The Strong Magnetic Field AGN–Quasar–Galaxy Formation Paradigm."[1] My 30-year-old strong-magnetic-field model for the cores of active galactic nuclei and quasars postulates the existence of an extremely intense, relativistic, gravitationally bound current loop around the central object, presumably a black hole.[2,3] A large fraction of the energy of the original gravitational collapse is stored in the current loop.

With an isotropic distribution observed for gamma-ray bursts by the Compton Gamma Ray Observatory, a reasonable concept from this strong-magnetic-field model is that when chunks of neutral matter (of asteroid size, perhaps) race across the intense primordial relativistic current loop, gamma-ray bursts of 1–500 seconds are produced, similar to what happens when one passes a target through an electron synchrotron beam. From table 1 in reference 3, which is deduced from a classic paper by Julian Schwinger,[4] the electron energy in the current loop is estimated to be as high as 100 GeV for a young, newly forming galaxy.

If only $1/10^9$ of the galactic mass makes up the gravitationally bound current loop, the stored energy in the loop is about 10^{58} ergs, a significant fraction of which can be converted into gamma rays by a variety of well-known nuclear reactions and other processes. The millisecond rise times of spikes in the gamma bursts describe the size of the slender filaments that make up the current loop, and the intensity time pattern of the burst indicates the loop structure. The cyclotron resonance lines observed previously are consistent with the extremely intense magnetic field adjacent to the gravitationally bound current loop.

The strong magnetic field's competitor, the thermal accretion disk model, has severe problems, as emphasized by Wayne Stein[5] and others. In addition, a recent paper by K. P. Rauch and Roger D. Blandford[6] has, for one particular quasar, ruled out not just the quasistatic disk but the thick disk and, in fact, all other opaque thermal models. Since the strong-magnetic-field model is clearly not an opaque thermal model, it is still viable and perhaps the leading candidate for the "central engine" for AGN quasar cores. Details on the production of gamma-ray bursts in this model will be reported elsewhere.

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2/92

Clemson University Clarification

I read with interest the news story entitled "Signs of Tighter Job Market Grow; More than Recession at Work," by Jean Kumagai and William Sweet (March 1992, page 55). I was surprised to see Clemson University described as a liberal arts college that received 550 applicants for one faculty position in physics. Clemson is, in fact, the technically oriented land grant university for South Carolina and has a PhD-granting department of physics and astronomy. The number of vacant positions in the department was five. Because of reductions in the state budget, we will probably fill only two this year to ensure sufficient startup funds for the successful candidates. The number of graduate students and the level of external funding in the department have been increasing rapidly in recent years, the intellectual environment is stimulating, and the climate is delightful, but even all that probably does not explain the sudden increase in applicants for faculty positions (734 compared to 450 last year). The search committee tells me that most of the applicants were highly qualified American citizens. As your news story correctly points out, there was a large number of candidates from industry and the weapons-oriented national laboratories.

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5/92

KUMAGAI AND SWEET REPLY: We apologize for the errors.

The Millikan Mail Drop Experiment

In response to the letters by Jerry Fields (October 1991, page 150) and Mike Seeds (March 1992, page 102) I would like to say that at least one physicist has been honored with a US stamp. Robert Millikan was on a stamp (the 45-cent stamp, I think). Considering that postal officials are going to honor songwriters and have honored comedians, I would support a *series* of stamps honoring scientists in various fields. Letters do make a difference; if you agree, the address is Citizens' Stamp Advisory Board, US Postal Service, 475 L'Enfant Plaza SW, Washington DC 20260.

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4/92

Why the Matthew Effect Is Self-Evident

Douglas Brewer's letter (October 1991, page 154) discusses the naming of the Matthew effect in science—the phenomenon of credit being given to the "haves" and being withheld from the "have-nots"—and concludes that it results from a "selective reading of the literature" (namely, the Gospels). It is interesting that Brewer cites a secondary source[1] for the modern description of the effect, not the primary source.[2] Had Brewer followed the paper trail, he might have discovered what some of us recall: His main point—that Mark described the same effect and published before Matthew—had already been made by Charles D. Geilker,[3] whose analysis suggests that the ultimate source was probably Jesus ("private communication"). Brewer's citation of John 15:2, however, does add to Geilker's work.

When the same saying or story (for example, the Christmas story) appears in several Gospels, Matthew is usually cited, perhaps because many people find Matthew the most stylish