

letters

continued from page 15

The NPF could be used to support postdoctoral fellows at various universities and in industry, according to the applicant's choice. The fellowship stipend could be set at \$6000 p.a. or at some other reasonable value, depending upon the number of applicants and the amount of money available. In addition, the NPF could be used to advance interest-free loans to such physicists who are temporarily unemployed.

I am sure those physicists who benefit from this fund would not mind supporting it after they have found a suitable job. In this way the NPF could be self-sustaining. I feel that a 1% contribution from fellow physicists is not too much to ask to perpetuate our own discipline. After all we spend more than 1% on many luxuries that could be easily suspended "temporarily."

I would very much appreciate readers' reaction to my proposal.

Inder P. Batra

IBM Research Laboratory
San Jose, Calif.

Antimatter cosmic rays?

The article by Hannes Alfvén on "Plasma Physics Applied to Cosmology" (February, page 28) made very interesting reading. Suppose a neutron antimatter star would collide with a koinomatter star. The resulting fireworks would be spectacular! It may be that most of the matter locked up in the neutron star would thereby be released.

There is one question that people have about Alfvén's theory that equal amounts of koinomatter and antimatter are present in the galaxy. According to current measurements, cosmic rays consist solely of koinomatter. This fact seems to be a crucial objection.

Sanford Aranoff

University of the Negev
Beer-Sheva, Israel

The author comments: The experimental fact that cosmic radiation in the energy range of 10^{10} – 10^{11} eV consists almost exclusively of koinomatter is either an objection to the matter-antimatter symmetry of our galaxy or to the current views on the diffusion of cosmic radiation. The Larmor radius of a 10^{11} -eV particle in a magnetic field in space of, say, 3×10^{-6} gauss is only 10^{14} cm or 10^{-4} light years. It is usually assumed that the space density of these particles has the same value in the whole galaxy as near the earth. Whether this is true or not depends upon the structure of the magnetic field in the outskirts of the solar system and in the heliosphere. We know practically nothing about these and have at present no possibility

to decide whether particles with small Larmor radii can diffuse easily through these regions or are screened off. Hence we are not in conflict with any observational fact if we assume—as originally suggested by R. Richtmeyer and E. Teller—that cosmic radiation in the energy range below the "knee" at about 10^{14} eV is a "local" phenomenon, accelerated for example at the outer shock front of the solar wind.

Cosmic rays above 10^{14} eV have such large Larmor radii that they cannot be confined in the heliosphere. Hence if it is shown that such high-energy cosmic radiation consists exclusively of koinomatter, this would be an argument against the existence of antimatter in our neighboring parts of the galaxy. But so far nothing is known about the sign of these particles.

Hannes Alfvén

The Royal Institute of Technology
Stockholm

Cost of Saclay linac

In a news story in the May 1970 issue (page 57) you report that the expected cost of the 400-MeV MIT linac is \$6.3 million compared to \$25 million for the 600-MeV linac now in operation at Saclay. I do not know exactly the final cost of the Saclay linac to the CEA (French equivalent of the AEC), but the original estimates were \$8 million for the linac, \$8 million for the experimental equipment and \$2 million for the building. It has been said that the building costs exceeded the original estimates, but \$25 million must include the wall-to-wall carpeting in the control room! I think the \$6.3 million for the MIT linac should be compared to the total cost for the Saclay linac of \$6.8 million (not including state taxes) for design, hardware, installation and testing required to provide the full 100-kW beam with 0.3% energy resolution.

R. Jean

Malakoff, France

Corrections

July 1971, page 15—Reference 1 should have been to *Phys. Rev. Lett.* 24, 1188 (1970).

June 1971, page 69—Our item on the appointment of J. Reginald Richardson as director of the TRIUMF project at Vancouver, Canada failed to make clear the fact that he will be on a two-year leave of absence from the University of California at Los Angeles.

June 1971, page 58—NCRP Report No. 39: Basic Radiation Protection Criteria is \$2.00 a copy, not \$20.00 as stated. □

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117

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