

SCIENCE

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LETTERS

AAS Position on the Space Station

In the News & Comment article “Societies drop opposition to station” (15 July, p. 311), Christopher Anderson reports that the American Astronomical Society (AAS) has changed its position and now supports the space station. This interpretation is incorrect. First, the AAS never officially took a previous position with respect to the station. Second, the AAS council recently debated the pros and cons of the station, but voted to adopt no official stance until its Committee on Astronomy and Public Policy had thoroughly examined all the issues and made its recommendations. Our letter to Vice-President Al Gore thus addressed the perceived threat of the possible cancellation by the Senate Appropriations subcommittee of the Advanced X-ray Astrophysics Facility (AXAF) or Cassini missions—missions which “have been widely studied and assigned the highest priority in the science community and are well into their hardware development stage.” Our letter went on to say

We need your assistance to resolve the [sub]committee’s funding shortfall and to avoid a confrontation between the space station and space science programs. The construction of the space station should not come at the expense of the AXAF and Cassini missions. Each of these programs provides a different path for exploring the universe. We urge the Administration to take the long view on these noble and worthy investments for the future.

To the extent that this appeal had any influence on the final favorable action taken by Senator Barbara Mikulski’s subcommittee with respect to the AXAF and Cassini missions, the AAS is pleased and grateful. In a similar context, the statements made by Peter Boyce, the Executive Officer of the AAS, in his interview with Anderson constitute not an endorsement of the station, but rather a recognition that the justifications for its construction are complex and involve geopolitical and economic issues that transcend purely scientific considerations.

Frank H. Shu*

Department of Astronomy,
 University of California,
 Berkeley, CA 94720, USA

*President, American Astronomical Society.

Superconductivity: The Real Dichotomy

The News article “New clues to superconductivity” by Daniel Clery (12 Aug., p. 860) reflects a sincere attempt to clarify a complex situation made more difficult by the climate of controversy that surrounds the field. However, the scientific points are somewhat subtle and, without prejudice as to the work of others, I would like to make my own position clearer.

Clery understandably presents a dichotomy, when in reality there is a wide diversity of views; but in doing so he gives the impression that I belong in what is in some sense a “traditionalist” camp, as opposed to the spin-fluctuation camp of David Pines, Douglas Scalapino, and Toru Moriya. In fact, from the start I have been a strong advocate of the idea that the mechanism cannot be the traditional one of pairing by means of phonon polarization, and the record shows that I actually introduced the model that is now being studied by Pines, Scalapino, and others into the field (Reports, 6 Mar. 1987, p. 1196) and pointed out the importance of antiferromagnetic interactions between spins. In my opinion, the experimental evidence, of a wide variety of types, excluding traditional phonon mechanisms of pairing has long been overwhelming. The main point relevant to Clery’s article on which I differ from many of the physicists in the field is in thinking that the symmetry of the gap is of little importance and was not necessary to prove that the mechanism is basically electronic. (A somewhat irrelevant point is that some of my collaborators were the first to suggest d-wave pairing).

The real dichotomy is whether one may or may not use traditional physics, that is, diagrammatic perturbation theory, in these materials. Pines and Scalapino are “traditional” in this sense. Experimental data of many kinds [some, but not all, of which I detailed in a *Science* article in 1992 (12 June, p. 1526)] proves that such theories are at best rough guides and on some crucial details they are qualitatively incorrect. In particular, they do not explain several striking features of charge transport in the normal state.

I have proposed a mechanism by which a nontraditional theory can lead to high T_c which agrees with many types of data. This proposal predates the work of Sudip Chakravarty *et al.* (Reports, 16 July 1993, p.