letters

Future of plasma space physics

The June issue describes much-needed funding increases in NASA's FY84 budget, particularly for physics and astronomy programs (page 43). These welcome increases will alleviate problems in a number of science programs.

Unfortunately, the budget category of physics and astronomy does not convey the entire story about NASA's support of physics research. The purpose of this letter is to alert your readers to a situation that threatens research in space plasma physics. The increasing precision of measurements, numerical modeling, and theory applied to space plasma problems have made the study of solar-system plasmas an important motivation and experimental arena for basic plasma-physics research. Moreover, the solar system is the primary laboratory in which certain astrophysical processes of great generality can be studied *in situ*. For these reasons, we believe our letter should be of interest to physicists and astrophysicists.

Because of managerial changes within NASA in the last year, the FY84 budget for physics and astronomy no longer covers space plasma physics, which had been an important element of the former NASA Division of Solar–Terrestrial Research. This NASA Division was abolished for nonscientific reasons. Its principal program elements, including solar physics, heliosphere physics, and space plasma physics (including the Earth's magnetosphere and ionosphere) were split between the Earth Science and Applications Division and the Astrophysics Division. The Physics and Astronomy budget line item applies totally to the Astrophysics Division at this time. Thus NASA's once carefully coordinated research in solar–terrestrial physics has virtually disappeared as an explicit organizational element. Space plasma physics, placed in an applications division, is no longer considered (for the first time since the beginnings of the US space program) a part of the physics and astronomy budget line for research support, including new missions and research and analysis.

NASA has not yet fully addressed the problems that the current organizational structure creates for space plasma physics and solar–terrestrial research, despite the fact that several National Academy studies conducted by the Space Science Board, the Geophysics Research Board, and the Polar Research Board have all emphasized the fundamental importance and unity of the subject. Further, a Committee of the Space Science Board made specific recommendations for a cost-effective coordinated program for the 1980s. These recommendations are being essentially ignored in NASA planning because solar–terrestrial physics has disappeared as an organizational entity. The Space Science Board expressed its concern to NASA about this problem in February 1983.

We view with considerable alarm the future of solar and space physics research in the nation. We believe that this area of research is diminishing ever more rapidly at the same time that NASA's overall budget, including physics and astronomy, is increasing. This trend will have adverse repercussions on other areas of science because, as stated in the Space Science Board report, *Space Plasma Physics*, this research area is "an important branch of science, concerned with problems of true intellectual significance that may be studied effectively in space and whose importance extends to laboratory physics as well as large-scale astrophysics." Will the US no longer be a participant in, to say nothing of being a leader in, solar-system plasma-physics research? Is this the direction that the nation wishes its space agency to take?

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(plus 18 other physicists associated with universities or industry)

7/83

Senior positions for women

The enhancement of physics faculty "by the addition of talented and accomplished senior women as faculty members" was advocated by Ralph Simmons in the March 1982 issue (page 120). In response, Janett Trubatch

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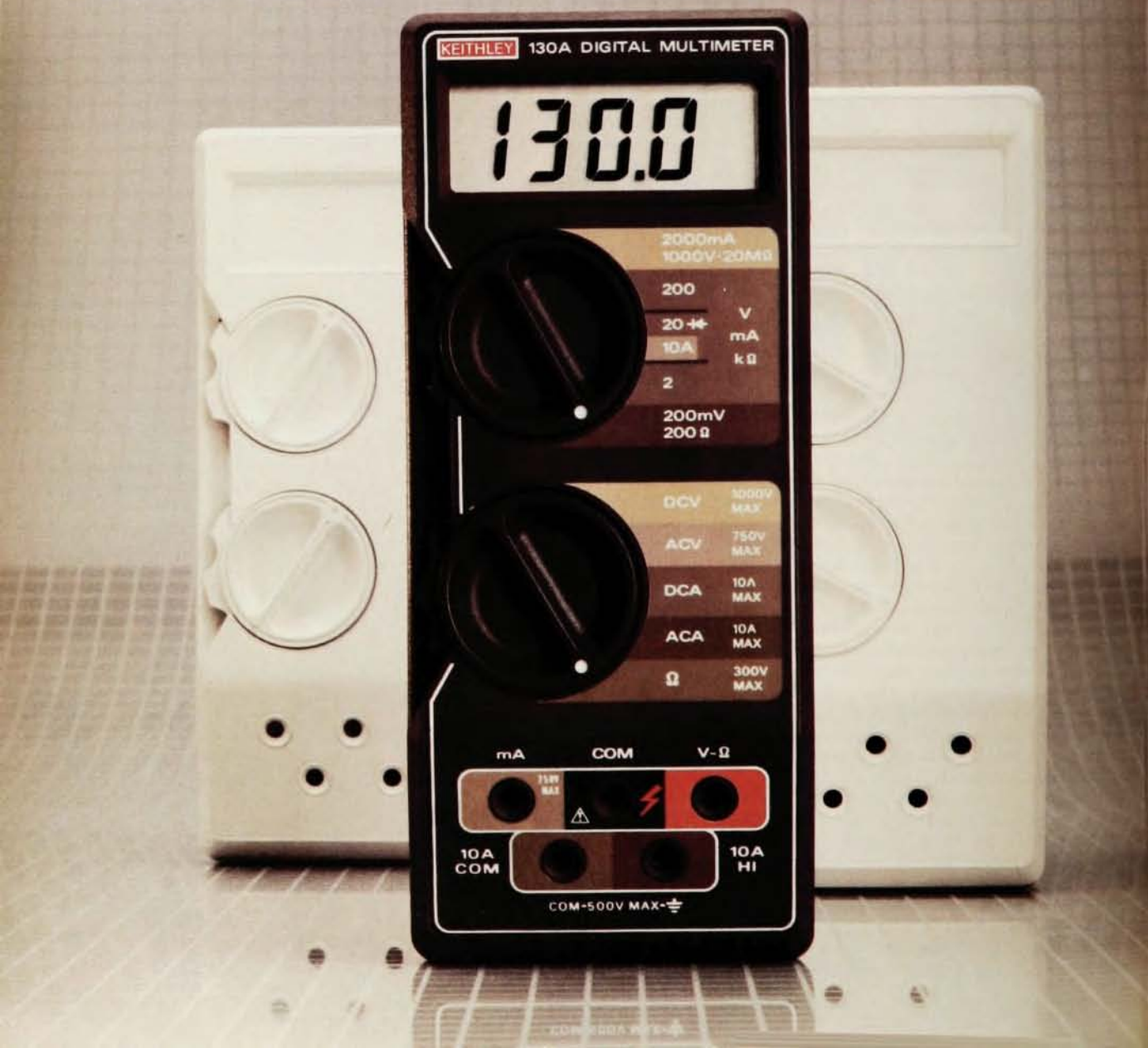

(November, page 11) surmised that the qualified women now outside academic physics would "be unwilling or unable to become professors of physics." Recent experience with the NSF Visiting Professorships for Women in Science and Engineering, however, supports a more optimistic outlook.

This NSF program, initiated in 1982, was designed to enable experienced women scientists and engineers to serve as visiting professors at academic institutions. Despite a lead time of only seven weeks between distribution of the program announcements and the application deadline, 118 proposals were received in response to the announcement, and 18 of these came from physicists and astronomers. The research proposals were of such high caliber, as evaluated in the usual peer-review process, and the funding was so limited, that the rejection ratio for highly rated proposals was several times that for typical programs. In all, 17 awards were made; two physicists and two astronomers were among the successful applicants. While approximately half of the awardees are already on academic faculties, the other half do not currently hold faculty positions in PhD-granting institutions. That split is true also for the physicists and for the astronomers.

The significance of the potential implied by these results must be considered in relationship to the situation requiring improvement. Findings of the Eisenstein–Baranger Survey on the 171 institutions in the United States granting PhDs in physics were reported in February 1982 (page 99). Of the 3665 senior physics faculty positions in these institutions, only 54 were held by women. An increase in this number by even one or two per year would be significant, particularly if that increase came in the 125 institutions having no woman at any rank among their physics faculty. Response to the NSF program adds further evidence to the findings of the APS Panel on Faculty Positions for Women Physicists, suggesting that there is a substantial pool of women, with the appropriate credentials, who would be willing and able to make the required career changes if suitable opportunities were presented.

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2/83

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The Council of the American Physical Society officially recognized the underrepresentation of women physicists on the faculties of major universities in 1981, by appointing a panel on senior faculty positions for women. The goals of the Council were to highlight the situation and to increase the number of women in senior faculty positions. I am pleased to report that the APS has now been joined in this endeavor by the American Astronomical Society, which has added two distinguished astronomers, Vera Rubin and Jeremiah Ostriker, to the Joint Panel.

The Panel now regularly receives letters from heads of departments and search committees. Through this means and others, the Panel is currently aware of dozens of open positions, either at tenure rank or convertible to tenure rank if a highly qualified woman candidate is identified. Although the faculties of US physics and astronomy departments as a whole are not expanding, there is still turnover in the system, even in departments of high research accomplishment and prestige.

At the same time, the Panel has identified dozens of women physicists who not only have had the kind of "notable careers in industry and in government laboratories" that I mentioned as an example in my March 1982 guest editorial, but also are willing to be approached by university departments. As with a significant number of men who first took industrial or government laboratory positions and later found satisfying faculty appointments in research universities, some of these women have indicated that they are now willing to explore the opportunity to work with graduate students in a university research setting, to teach and to join colleagues in the life and work of an academic community. By their accomplishments, these women have earned the attention of our Committee and would be valuable additions to this community.

Key to accomplishment of these APS and AAS goals is the encouragement of high standards for these appointments. This includes both the qualifications of the women and the resources for their research to be provided or found in the university setting. From its experience to date, the Panel is encouraged to believe that these goals and high standards are realistic. The proportion of senior women in academic positions is very small, but when the numbers are small, each new appointment can be significant.

RALPH O. SIMMONS
APS–AAS Panel on Faculty Positions for Women Physicists and Astronomers
8/83

Arms-race education

PHYSICS TODAY is certainly to be commended for assembling the March issue, which addresses the single most crucial issue of our time, the nuclear arms race, and points to the benefit