

For the future of astronomy

Astronomy, the oldest science, has contributed enormously to the material, cultural, and intellectual fabric of our lives and our society. Besides providing the usual benefits that stem from any scientific research, astronomy exercises imaginations and widens horizons in ways that can be directly shared by a wide segment of society; it has an especial appeal and (I believe) an especial importance to people in many walks of life.

The last 20–30 years have seen a revolution in our understanding of the universe, unrivaled since the time of Galileo. American telescopes, American scientists, and the American space program have been at the forefront of this revolution. The report, *Astronomy and Astrophysics for the 1980s*, just released by the National Academy of Sciences and summarized in this issue (page 46) presents a carefully structured program designed to assure the continued health and productivity of American astronomical research. The proposed program is realistic and realizable within reasonable financial and manpower expectations. It does not call for a large increase in astronomical research. It does indicate areas that need strengthening, and it does recommend, in order of priority, major new projects for the 1980s to follow and complement the major new projects of the 1970s. For example, the Advanced X-Ray Astrophysics Facility, the first-priority project, would provide comparable capability in the x-ray domain to that provided in the radio by the recently completed Very Large Array and in the optical by the soon-to-be-launched Space Telescope.

The Astronomy Survey Committee and its chairman, George Field, have done a difficult job well. The Council of the American Astronomical Society has passed the following resolution:

The Council of the American Astronomical Society strongly endorses the Report, *Astronomy and Astrophysics for the 1980s*, of the Astronomy Survey Committee (the "Field Committee") of the National Academy of Sciences, which recommends a program for support of astronomical research with ground-based and earth-orbital facilities during the next decade. This report is a carefully balanced and comprehensive plan based on the

work of more than 300 astronomers in several working groups and panels over a period of three years. The recommended program addresses profound and exciting scientific questions and presents extraordinary opportunities for new discoveries during the coming decade.

The report and its program come at a critical time. The decade of the 1970s was a period of great accomplishment and exciting advances for both ground- and space-based astronomy. It was also a period of slow but steady erosion of support for ground-based astronomy as funded by the National Science Foundation. Present indications in Washington are that the decline of astronomy funding by NSF will continue, or at best be stabilized at its current depressed level. There is also concern about whether the NASA astronomy program will be maintained at or near the level of the 1970s. Short periods of inadequate funding can perhaps be absorbed without excessive damage. Continued underfunding will ultimately have serious consequences, the most important of which are difficult to predict.

The most important benefits that the US obtains from its investment in astronomical research are subtle and fundamental. Furthermore, they appear with a very long time constant; today's research may have a profound impact on society in ten or fifty or one hundred years, but not usually in one or two years. Similarly, the most important losses that may be incurred by too little support of astronomy will affect the future more than the present, and in ways that cannot be readily anticipated. This long reaction time makes it difficult to determine what is a "reasonable" level of support for US astronomy. The Astronomy Survey Committee report does just that, however. It proposes a reasonable program for astronomy in the 1980s, based solidly on the accomplishments of the previous decade. With this program we can realistically expect to maintain and further the vitality of US astronomy. We should do no less.

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