adaptive optics in the visible. However, the Mount Wilson Institute has been conducting an astronomical observing program in the visible with an adaptive optics system for nearly 2 years.

The system was built by the Massachusetts Institute of Technology's Lincoln Laboratory for military applications. It was installed at the 60-inch telescope on Mount Wilson in 1992 in a program aimed at assessing the usefulness of the technology in astronomy. The 60-inch telescope with adaptive optics has achieved images with a full width at half maximum of 0.115 "at a wavelength of 600 nanometers—only 21% larger than the diffraction limit of 0.095" for this telescope. To my knowledge, the Mount Wilson images are the closest to the diffraction limit ever achieved at visible wavelengths for a large telescope on the Earth's surface.

While the principles of adaptive optics were proposed by Horace Babcock in 1953, as Marshall notes, the astronomical community would never have been able to obtain the half-billion dollars in research and development funds which the Air Force and the Strategic Defense Initiative spent in the 1970s and 1980s to translate the proposal into reality. The fact that this revolutionary development has been available to astronomers in this century is entirely the result of the huge Defense Department investment in the development of the essential technologies.

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Space Science Crunch

As an astrophysicist, I know well "The coming crunch for space science" (News & Comment, 18 Feb., p. 908). It is already here. Instead of complaining, we should ask how we can do the best science with the funds available. Experience shows that a scientific field dies when the intervals between experiments exceed a decade because the cycle of data, interpretation, new ideas, new experiments, data is broken. A field will also die if the support for data analysis, theory, and new experimental methods is sacrificed to pay for the construction of large missions. The planned budget cannot support two large missions and the rest of the space science program. The best solution for space science would be to replace the Cassini mission and the Advanced X-ray Astrophysics Facility with "smaller, faster, cheaper" missions. No single experiment or facility is worth a billion dollars.

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Anderson's news article provides a factual statement of the current situation, yet its overall tone does not convey (in my opinion) the National Aeronautics and Space Administration's (NASA's) strong commitment to space science. This commitment is demonstrated by the numbers in the fiscal year 1995 budget request: a modest increase for the Office of Space Science (including a new start for Mars Surveyor), along with a larger increase for Mission to Planet Earth, notwithstanding an overall decrease in the NASA budget. Space science might have fared much worse. Many of us in the scientific community are appreciative of NASA's efforts to maintain a viable scientific program given the budget pressures. As Anderson points out, NASA also responded to the scientific community and obtained funding for the ongoing operation of the International Ultraviolet Explorer and the U.S. involvement in the ROSAT satellite.

While the budget request does forecast a decline for space science in fiscal years 1996 and 1997, NASA is just now developing specific numbers that will lead to the fiscal year 1996 budget request. In this context, NASA administrator Daniel Goldin has already testified before the House and the Senate authorization subcommittees that NASA recognizes it still has to find between $200 million and $300 million in the outyears for a few, modest-sized, new starts in space science.

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National Protein and Nucleic Acid Databases

Protein and nucleic acid databases are vital resources for the biomedical community. As these databases grow and become more widely used, close communication among the scientific communities that contribute to and use them, the government agencies that fund and oversee them, and the database staffs that develop and maintain them becomes increasingly important.

Many of our members contribute to and rely heavily on these databases and we wish to increase our involvement in their operation. As a first step, we will sponsor a meeting from 13 to 14 June to consider how to ensure that the future development of protein and nucleic acid databases serves the needs of the scientific community.

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Smallpox Virus: Better to Store?

Pathogenic properties that appear to be unique to the smallpox virus have made it, and not vaccinia or other viruses, the most deadly virus to have affected mankind. Because of its marked virulence, one cannot rule out the possible benefits that study of the smallpox virus may provide at some future date (Policy Forums, 19 Nov., pp. 1223 and 1225; Letters, 18 Feb., p. 903). At this time, perhaps existing stocks should be subject neither to research nor to extinction, but should remain in storage until future scientists deem what further research may be necessary.

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