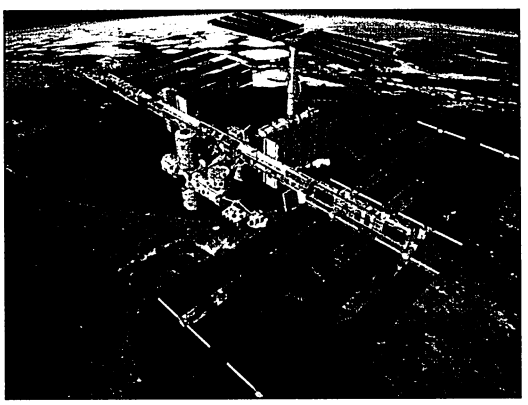
False Promises for European Space Science

AT ITS MEETING IN NOVEMBER IN EDINBURGH, the European Ministerial Council agreed to accept about 70% of the budget proposed by the Director General of the European Space Agency (ESA), amounting to about €7 billion [(€1≈$0.89)] for the period of 2002 to 2006. This cut severely threatens European space-related scientific programs and endangers the efforts of the scientific community to fulfill its research objectives in this area, particularly when new research initiatives are considered. In fact, the decision at Edinburgh to support only about 50%, that is, about €165 million for 5 years, of the program ELIPS: Life and Physical Sciences in Space utilizing the International Space Station is devastating. It is certainly contrary to the strategic commitment made in March 2000 in Lisbon by the European Council, where the aim was to make Europe the most competitive and dynamic knowledge-based economy in the world (*1*). On this basis, sustaining sufficient support for research activities in the field of space-related sciences would have been a logical commitment for the ministers at the Edinburgh Council.

The irony of this unfavorable decision is that the ELIPS program had been highly rated by the ministers. Indeed, the process of formulating and refining the ELIPS program involved tedious consultation within the scientific community and discussions with the scientific consulting bodies of ESA and was also guided by the European Science Foundation. The resulting program is tailored to support the research objectives of the European Commission, emphasizing transnational scientific cooperation in the true spirit of the new Europe. At the heart of the selection of priorities were research proposals that were reviewed by panels of independent, international experts. There can be no doubt that the projects selected for ELIPS are of the highest scientific standard attainable.

Therefore, it is most regrettable that the budget has been so severely cut. The original budget for the ELIPS program of €500 million had already been downsized to €320 million after long discussions with the delegations of the ESA Manned Space Flight and Microgravity Program Board, where a compromise between the industrial returns for different countries and excellence of scientific objectives had been sought. The decision in Edinburgh to further cut the ELIPS budget now threatens the implementation of these scientifically important studies.



ESA programs such as ELIPS, which will use the International Space Station (artistic rendering pictured above), are facing severe budget cuts.

CREDIT: NASA

In an unprecedented stand on these matters, the report (*2*) by the 20-member U.S. panel led by Thomas Young and set up by the White House in July to analyze the costs of the International Space Station concluded that research in general and biology in particular needed much more emphasis if this massive engineering project is to turn into a realistic science program.

We, as chairmen of ESA scientific consulting bodies, representing the scientific community at large and not being personally involved in space-related science, strongly resent the decisions taken at Edinburgh and urge the ministers to reconsider their financial priorities.

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1. Declaration of the EU Heads of State, Portugal, Lisbon, 23 to 24 March 2000.
2. Report by the International Space Station Management and Cost Evaluation (IMCE) Task Force to the NASA Advisory Council, 1 November 2001.

Biotech Gap Between North and South

IN THE PAST FEW YEARS, WE HAVE HEARD A great deal about the uses of biotechnology and how new technologies can improve health and agriculture in developing countries. It is clear that there is an urgent need for biotechnology research and training in many of these nations. In their Viewpoint article "Harnessing genomics and biotechnology to improve global health equity" (special issue on Unlocking Biology's Storehouse, 5 Oct., p. 87), P. A. Singer and A. S. Daar highlighted a number of important factors necessary for biotechnology growth. It should be added, however, that in order for these new technologies to make a long-lasting contribution, the role of government cannot be left out.

At the Program in Science, Technology and Innovation of Harvard University (*1*), we have been analyzing strategies used by developing nations to build their strength in biotechnology. Our research has identified local government commitment to innovation as the major common element for success. This commitment is manifested not only in the form of financial instruments (research grants and tax incentives)

Letters to the Editor

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but, more importantly, as a policy of human resource development. Countries such as Brazil, Argentina, Mexico, and India have integrated biotechnology research as part of a comprehensive local development plan, creating the necessary critical mass of scientists and technical personnel for their nascent biotechnology industries. This model, however, requires a significant initial investment, and thus could only be relevant for the larger, more prosperous developing countries with greater research capacity.

Of particular concern, however, are less developed nations with extremely limited financial resources, such as the Central American countries, which are facing serious economic constraints and a human development index in the range of 150 to 152 (*2*) (countries are ranked from 1 to 162 on the basis of life expectancy, educational attainment, and adjusted real income). For illustration, according to the World Bank, Nicaragua's 1998 gross national product was just over $1 billion, which is very little to supply the needs of a country of more than 4.5 million people. As a result, Nicaragua's university system receives only a meager fraction of the national budget and cannot afford the cost of high-level molecular biological and biochemical equipment. One pertinent question that emerges is whether biotechnology methods are sustainable in the more severely under-developed countries without continuous outside technical and material support.

An alternative approach for these struggling nations could be the establishment of direct links to international biotechnology firms and the creation of regional biotechnology initiatives. One example is the initiative of the University of Central America (UCA, Nicaragua) in partnership with the University of Florida, Gainesville (*3*), and also its initiative developed in collaboration with the Competitiveness Program of Harvard University, which aims to transfer biotechnology expertise through Inter-University Centers in various countries. The program is based on the idea that biotechnology research and development is a fundamental factor for economic growth in the Central American region (*4*). These university-industry partnerships, coupled with governmental commitment to scientific expansion, could begin to close the technological and economic gaps between the North and the South.

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1. See http://www.cid.harvard.edu/cidtech
2. *Human Development Report, 2001* (Oxford Univ. Press, New York, 2001). Available at http://www.undp.org/hdro
3. See http://www.biotech.ufl.edu/btopsite/pages/btoptext.html
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Response

WE AGREE. THE ROLE OF GOVERNMENT IS important. In relation to the strategy we describe in our Viewpoint article, government would be a key focus of the research in the country case studies, a crucial participant in consensus building and capacity strengthening, a potential investor in the fund, and the key receiver of public input.

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