

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Research and Development Programmes—Budget Plan

(Thousands of dollars)

	FY 1971	FY 1972	FY 1973
Manned Space Flight	1,422,469	1,285,475	1,224,400
Apollo	913,669	601,200	128,700
Space flight operations	507,300	682,775	1,094,200
Advanced missions	1,500	1,500	1,500
Space Science	398,654	552,900	669,400
Physics and astronomy	115,956	110,100	156,600
Lunar and planetary exploration	144,900	291,500	321,200
Bioscience	12,898	—	—
Launch vehicle procurement	124,900	151,300	191,600
Applications	166,960	187,500	194,700
Space applications	166,960	187,500	194,700
Aeronautics and Space Technology	260,336	212,825	249,340
Aeronautical research and technology	100,132	110,000	163,440
Space research and technology	105,004	75,105	64,760
Nuclear power and propulsion	55,200	27,720	21,100
Tracking and Data Acquisition	289,943	264,000	259,100
Technology Utilization	4,000	5,000	4,000
Total	2,542,362	2,507,700	2,600,900

Solar Observatory Programme—OSOs J and K have been scrapped for budgetary reasons. On the other hand, however, a substantial increase is being proposed for the high energy astronomy observatories, which are down for \$59.6 million in 1973, and the Viking programme which is scheduled to get \$229.5 million.

The NERVA programme has again been subjected to the budgetary axe, but this year instead of merely cutting the programme, the Administration is asking for its total extinction. So far, NASA and the Atomic Energy Commission between them have pumped \$1,400 million into the project, but it has now been decided that the research should give way to research on a smaller nuclear electric system which would provide the capability of reaching the outermost planets in the 1980s. The NERVA programme is, however, a perennial favourite of Congressional supporters of space research, and it is very likely that the authorizations committees will again try to keep the project going. Last year, when the Administration only provided just enough funds to keep NERVA going, Congress increased the appropriations, only to have the Office of Management and Budget withhold the increase.

NATIONAL SCIENCE FOUNDATION

New Directions

By our Washington Correspondent

In tune with the policy of funding scientific activities that are likely to be socially useful, the budget of the National Science Foundation shows significant increases in the amount of money requested for the support of applied research. Also included in the budget are funds for eliciting information on the process by which basic research is ultimately transformed into

marketable products or into growth in GNP, and another large new project will be concerned with finding methods for stimulating non-governmental research and development. But in spite of these new directions, the largest single programme increase for the NSF is for support of basic research.

Overall, the foundation's budget request amounts to \$674.7 million, which includes \$21.7 million carried over from 1972 in unallocated funds. New appropriations amount to \$653 million, compared with the total of \$622 million appropriated for 1972. Of these funds, scientific project support is set to take \$275.3 million, and some 7,400 faculty scientists and 7,000 graduate students are expected to benefit from the 6,200 grants that the foundation hopes to distribute. This project support request represents an increase of some \$28.7 million compared with the foundation's budget for 1972. But even in this category, the foundation emphasizes, in a statement explaining its 1973 budget request, that attention will be given "to those areas where new knowledge and understanding can lead to opportunities for solution of social, environmental and engineering problems".

Perhaps the most significant item in the NSF's requests for support of basic research is the \$3 million earmarked for a start to be made on the Very Large Array antenna system. Radio astronomers have lobbied for the telescope array for the best part of a decade without success and, although no decision has yet been taken about where the VLA will be situated, Arizona seems to be the favourite among some astronomers. The radio telescope at Arecibo is scheduled to receive \$3.3 million, slightly less than last year when the budget request included funds for resurfacing the dish, the Kitt Peak National Observatory is down for \$8.2 million, the National Radio Astronomy

Observatory is to receive \$7,200 in addition to the \$3 million set aside for the VLA and the National Center for Atmospheric Research is set to receive \$17.9 million.

The programme of Research Applied to National Needs, a set of projects which have the potential for increasing economic productivity or which have potential social applications, is down to receive \$80 million. This request is about the same as the foundation asked for last year, but Congress took a dislike to the programme, chopped some \$26 million from the request and put the money into the foundation's education support programmes. This year, the RANN programme has been expanded to take in research on solar energy, earthquake research and tunnelling technology—projects which may win more favour with Congress than the RANN programme has earned in the past.

What annoyed Congress last year was that the NSF had cut its budgets for student and institutional support, while at the same time increasing its requests for the RANN programme, a situation which drew from the House Appropriations committee the tart remark: "The committee will expect the foundation to utilize the funds included for science education support and for institutional support for science as recommended, instead of the diversion of additional funds to basic or applied research". The foundation had little chance to divert funds from education, because the Office of Management and Budget withheld much of them, and the NSF is again asking for reductions in its institutional and graduate support funds. Funds for science education improvement are, however, increased by \$3.9 million.

Another significant new programme to be conducted jointly by the National Science Foundation and the National Bureau of Standards is aimed at finding out how non-federal investment in research and development can be stimulated. The foundation is requesting \$22 million for this purpose, which will be spent on trial projects to explore such devices as cooperative undertakings between industry and universities, new institutional arrangements and other mechanisms. The NSF's stake in the enterprise will be confined chiefly to long-term research projects, while the National Bureau of Standards is asking for \$18 million to stimulate the marketing end of the innovation spectrum.

As Dr William D. McElroy, who leaves the directorship of the NSF on February 1, remarked last week, the foundation has changed markedly from three years ago, when it was concerned almost exclusively with basic research and education.