

US budget: NSF wins, space science loses

- Aerospace plane, big boosters cut to save Station
- NSF, led by education, gets 11 per cent increase

Washington

RESEARCH lobbyists dread autumn in Washington. Almost anything can happen to the US science budget in the last weeks of September, when legislators rush to finish negotiations in time for the 1 October deadline. A year ago, the National Science Foundation (NSF) lost more than \$100 million when a plan to transfer the money from the Defense Department was vetoed with just hours to go.

Last week, in a House-Senate conference agreement, it was the National Aeronautics and Space Administration (NASA) that took the last-minute cuts, as Congress slashed plans for a new generation of large booster rockets and essentially abandoned the National Aerospace Plane (NASP) programme to save the Space Station.

While NASA science programmes were hit hard, basic research at NSF came out quite well. NSF received the largest total increase of any agency — 11.2 per cent. As expected, its popular science education programme won the largest increase — a 44 per cent rise to \$465 million in 1992. Research also did well, with an increase of 10.9 per cent to \$1,879 million. Surprisingly, funding for the Laser Interferometry Gravitational-wave Observatory was not deleted, so NSF will consider it a “live project” for startup in 1992, says NSF analyst Joel Whitter.

Another \$105 million of NSF funding still hangs in the balance. Earlier this month, the White House Office of Management and Budget (OMB) vetoed a plan to shift \$375 million from the Defense Department to NASA to cover military use of some NASA communications satellites. But it left open the question of who should pay for Navy support duties at the NSF Antarctic bases. NSF is assuming that the Navy will cover the \$105-million expense, but until the agency gets a firm word from OMB, last year's surprise veto of the same transfer remains a disquieting possibility.

The big question mark in both the NSF and NASA budgets has been the Space Station. After doing combat all year over whether to continue the \$37,000-million project in the face of technical problems that have cut its capabilities in half, Congress finally decided not only to do it, but to do it once and for all. The House-Senate conference granted the Station \$2,029 million — the entire presidential request. “It's finally out of the woods,” says John Logsdon, a professor of space and science policy at George Washington University in Washington, DC.

Congress's largesse on the Station came at a cost, however. Space science projects across the board will be cut, delayed or cancelled outright. The Advanced X-Ray Astrophysics Facility (AXAF) lost \$60 million and will be delayed a year. The twin space probes CRAF-Cassini — one to intercept a comet, the other to visit

1992 congressional appropriations

(millions of dollars)

Selected programmes	1991	1992	
		request	conference
National Science Foundation			
Research	1,694	1,964	1,879
Education	322	390	465
Instruments & facilities	20	50	33
Antarctic	175	193	88*
NASA			
Research & development	6,023	7,198	6,414
Space flight	5,124	5,608	5,158
Space Station	1,900	2,029	2,029
NASP	95	72	5
NLS	24	175	33
AXAF	101	211	151
Life sciences	137	184	149
CRAF-CASSINI	143	338	211
EOS	187	336	296
Earth probes	52	48	68

*Pending the transfer of an additional \$105 for the Antarctic programme from the Department of Defense, whose budget is not expected to be finished until November.

Saturn — were both retained, although the programme as a whole was cut by \$117 million, which will delay Cassini by at least a year. LifeSat, a proposed reusable radiation-biology satellite, was terminated.

Among the programmes to escape the knife were the Earth Probes series of small remote-sensing satellites and the data-handling portion of the Earth Observing System (EOS). Congress earmarked \$15 million to start on a Climsat probe and \$5 million of additional instrumentation for the Tropical Rainfall Measuring Mission. It also added \$25 million of start-up funds

US RESEARCH POLICY

New direction for fusion

Washington

US FUSION scientists will have to rethink their programmes and goals and quickly come up with a new plan of action, now that funding has dried up for the Burning Plasma Experiment, planned as the next major step in fusion research (*Nature* 353, 287, 26 September 1991). The Fusion Energy Advisory Committee met for two days last week and came up with a set of

recommendations to the Department of Energy (DOE) on where to go from here.

The big loser at NASA was the National Aerospace Plane (NASP), the planned hypersonic air/spacecraft that would be propelled from runway to orbit by hybrid jet-rocket engines. Congressional concern over the untested engine technology combined with budget pressures led legislators to conclude that research progress so far did not justify continuing with the programme. The House-Senate conference cut the programme to a burial-fee \$5 million. “They're basically saying ‘last guy out, turn off the lights,’” says John Pike, space analyst for the Federation of American Scientists.

Nevertheless, there may still be a glimmer of hope for the NASP. The programme is a collaboration between NASA and the Air Force, whose budget is still at least a month from completion. The National Space Council, led by Vice President Dan Quayle, has championed the project, and pressure from it could conceivably convince Congress to find enough money to save it in the defence budget.

Quayle has competition for his attentions, however. Earlier this year, his Space Council released a document outlining a National Launch System (NLS), which would combine the second-generation Shuttle C launcher with portions of the Strategic Defense Initiative (‘Star Wars’) Advanced Launch System programme. At an estimated cost of \$10,000 million by the end of the decade, the NLS was intended to provide a new family of heavy launch boosters that could carry payloads from 25 tons (the limit of current US launchers) all the way up to 300 tons. But short of the President's Mission to Mars initiative (which was again removed from the budget this year), no currently planned projects would require such a large booster. Although the President's January budget request had \$175 million for NLS, Congress last week left in only \$20 million to continue some engine development work.

Unlike the NASP, the NLS cuts are considered a temporary measure. With an ageing and inefficient fleet of shuttles, “there's a broad consensus that we need a new launch system,” Logsdon says. “The NLS will back.” **Christopher Anderson**

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The DOE, facing a projected decline in available research funds over the next five years, had asked the committee how it would deal with two possible scenarios: zero real growth in the coming five years, and five per cent annual growth. Committee chairman Robert Conn of the University of California, Los Angeles, said that