

Japan's budget request up by 13 per cent on this year

Tokyo

SUPERCONDUCTORS, AIDS and international cooperation take top billing in the budget requests for fiscal year 1989 just submitted by Japan's science-related ministries and agencies. Alongside are requests for the backing to develop a large helical fusion device and to initiate national projects on neurocomputers, hypersonic transport and technology for digging super-deep tunnels.

The budget requests for all government organizations total more than ¥64 million million (about \$500,000 million), 13 per cent up on last year. The Ministry of Finance is expected to trim these requests to about ¥58 million million when the budget is finalized at the end of this year. But appropriations for science and technology are usually little changed in the end-of-year negotiations.

Perhaps the most original idea in this year's budget comes from the Ministry of International Trade and Industry (MITI). MITI wants to develop technology to tunnel deep under Japan's overcrowded cities. The project is a ploy to get around extortionate land prices. The idea is to tunnel deeper than 50 m and create gigantic caves in which factories and electric power generators will be installed. By going deeper than 50 m, the ministry hopes to reduce drastically the costs paid

Titan launches

Washington

A MODIFIED Titan 2 rocket was used by the US Air Force on 5 September to launch an undisclosed payload from Vandenberg Air Force Base in California. It was widely reported that the rocket placed four US Navy satellites, collectively known as White Cloud, into low polar orbit, from where they will track shipping and eavesdrop on electronic communications.

The launch came only three days after another Titan 2 launch from Cape Canaveral. But the Associated Press reported that the upper stage failed to ignite properly, and a satellite designed to monitor Soviet communications did not reach its intended geosynchronous orbit.

The two launches herald a large programme of non-shuttle launching for military purposes. A number of Titans have been converted from intercontinental ballistic missiles to satellite launchers, and new rockets are on the order books. Although shuttle launches are due to resume soon, with several places reserved for military payloads (*Nature* 335, 105; 1988), there is a backlog of such satellites waiting to be launched. David Lindley

for space to surface landowners whose ownership rights are limited to a depth of a few tens of metres. The ministry has requested ¥30 million to study the tunnelling technology and to look at the legalities of land ownership deep underground.

Several ministries want to boost funds for superconductor research. MITI has requested ¥4,480 million (\$33 million), ¥1,000 million more than for this fiscal year. Much of the increase will go to a larger contract for the International Superconductivity Technology Center set up earlier this year by private industry and MITI to develop the new high-temperature superconductors. There is also a large increase in outlays under the energy-saving 'Moonlight Project' to develop a 70,000-kW superconducting generator that will employ conventional nickel-titanium superconducting wire.

Similarly, the Science and Technology Agency is seeking an extra ¥1,000 million for research on the new high-temperature superconductors under its 'multi-core project' which involves various of the agency's research institutes; a total of ¥3,082 million is requested.

The Ministry of Education, Science and Culture will launch two new superconductor projects next year under its grant category 'priority areas of research' which support research by large groups of scientists with annual funds of a few million dollars. Hiroshi Hara of Chiba Institute of Technology will head a three-year project entitled 'new electronics based on high-temperature superconductors' while 'chemical design and processing of the new high-temperature oxide superconductors' will be led by Kazuo Fueki of the Science University of Tokyo.

The ministry of education's largest new request, however, is for a giant helical fusion device which will employ superconducting magnets and will be housed in a new national research institute to be built in Gifu Prefecture (see *Nature* 335, 104; 1988); ¥2,480 million is requested for research and development of the superconducting magnets, ¥572 million to begin construction of the new institute and ¥1,699 million for administration and running costs (excluding personnel costs).

The Ministry of Health and Welfare wants to increase outlay for the fight against AIDS by more than 70 per cent. The ministry has requested ¥1,383 million for research and development of anti-AIDS drugs and vaccines, ¥251 million for AIDS prevention and counselling measures, ¥178 million for running the ministry's new AIDS Research Center and AIDS Medical Information Center, set up earlier this year in Tokyo in the

National Institute of Health and National Medical Center respectively, and \$2.5 million for the World Health Organization's anti-AIDS programme.

The ministry is also seeking ¥236 million to start a project to isolate and characterize the virus responsible for hepatitis non-A non-B which is a major health hazard in Japan. Experiments on chimpanzees will be carried out in collaboration with US scientists at the Liberian Institute for Biomedical Research, which was established in Africa by the New York Blood Center. And the ministry has also applied for ¥550 million to invite about 60 foreign researchers to Japan, most of whom will be specialists in the study of this virus or AIDS.

Japan has been criticized for the imbalance in exchange of researchers with the West. All the science-related ministries and agencies have asked for extra funds to invite foreign researchers to Japan. The Science and Technology Agency has applied for ¥950 million for 130 postdoctoral fellows, up from 100 for this fiscal year, and the Ministry of Education has also applied for support for another 130 (again up from 100). But the new fellowship programmes, which began only in this fiscal year, are suffering from a lack of applicants, and it is uncertain whether the Ministry of Finance will provide funds for more.

The Human Frontiers Science Program seems set to get under way at last. MITI and the Science and Technology Agency have requested a total of ¥2,586 million (\$19 million) for a foundation in Europe that will distribute international grants for research on the brain and on molecular recognition and response. The scheme will begin in autumn of next year.

MITI hopes to begin several new projects next year. Twenty million yen is set aside for a study of neurocomputers. A group at Tokyo University and several electronics companies, including NEC and Fujitsu, are carrying out small-scale research but MITI is now thinking of a national project.

MITI also hopes to get research under way on engines and airframe materials for a hypersonic plane. The ministry has requested ¥30 million to initiate a new project on hypersonic propulsion systems under the ministry's category of 'large-scale' industrial projects, and another ¥159 million to study development of a '75-seat class' hypersonic private transport facility.

In addition, MITI also plans to establish a new research centre to develop ceramics and carbon composite materials resistant to ultra-high temperatures for application in aviation and space technology. The centre will form part of the recently reorganized New Energy Development Organization (see *Nature* 333, 4; 1988).

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