

# International cooperation on superconductors

- First Japanese symposium held
- Nationalistic competition inevitable

## Tokyo

JAPANESE superconductor researchers are hoping for international cooperation and the US administration sees the inevitability of nationalistic competition. That was the message from a panel discussion on "international cooperation" by speakers from the United States, Japan, Europe and India at a symposium on superconductivity held in Japan last week.

The symposium was the first arranged by Japan's International Superconductivity and Technology Center (ISTEC), an information centre and research consortium set up earlier this year with funding from the private sector and the Ministry of International Trade and Industry (MITI).

Professor Shoji Tanaka, vice-president of ISTEC, compared the centre's goals with those of other national MITI projects: the very large scale integration (VLSI) project (1976-80); the optoelectronics and optical communications project (1979-85); and the new functional devices project (1981-91).

He pointed out that each new project is longer than the one that went before and orientated towards more distant commercial goals. He expects the present superconductor project to last for about ten years on a budget of around \$150 million, and believes that commercial applications are distant enough to allow international collaboration on basic research.

Setting up collaborative research projects in Japan is not easy. M. Uenohara of NEC Corporation explained that Japanese electronics companies "compete furiously" in the market; at the start of the VLSI project, researchers from the different companies in the project were unwilling to communicate. After a year of negotiations it was agreed to limit research to "pre-competitive technology". From then on the researchers worked together like "family members", according to Uenohara. He thinks a similar style of cooperation on superconductors is possible at the international level.

Not everyone would agree with the value of such international cooperation. The VLSI project has been much studied because of a common perception that it had propelled 'Japan, Inc.' to international dominance of the semiconductor memory market. Many experts feel that the strength of that project (and those that came after) was not in cooperative basic research, but in creating a consensus in giant electronic companies that the semi-

conductor race must be won. So the cooperative project stimulated competition. Foreign companies thus worry that joining in a 'cooperative' project in Japan might simply provide basic research results to fuel the applications race.

Paul McLaughlin, director of the Council on Superconductivity for American Competitiveness (CSAC), said "nationalism" will be the driving force behind advance in superconductor research. But he did acknowledge the need for international exchange of information and says that CSAC's information services are open to everyone.

CSAC is proposing to form a research consortium, the Superchip Corporation, funded by private industry and possibly backed by US federal government bonds. The council is lobbying for legislation to exempt the corporation from US monopoly laws, and Superchip may also get special treatment over patents, McLaughlin says. But unlike Japan's superconductivity centre which is open to foreign companies, CSAC and Superchip are for US companies only.

McLaughlin says the United States will spend \$205 million on superconductor research in the fiscal year beginning 1 October. Much will be spent on defence-related research in government laboratories, which have a poor reputation for transferring technology to the commercial sector. McLaughlin says CSAC's purpose is to ensure that the United States is competitive by organizing communication between government labs and industry.

India, on the other hand, has been hard pushed to scrape up \$10 million for superconductor research this year, according to C. N. R. Rao of the Indian Institute of Science; developing countries "can never be equals" to the advanced nations. And he appealed for international cooperation.

The governments of the United Kingdom, France and West Germany are each spending a few tens of millions of dollars on superconductor research and new research centres have been set up in collaboration with industry, according to panel speakers. Sir Martin Wood, chairman of the UK National Committee for Superconductivity, says a standing committee has been formed by six member nations of the European Community. Wood says he thinks superconductors could provide an important example of European cooperation and "will if I get my way".

David Swinbanks

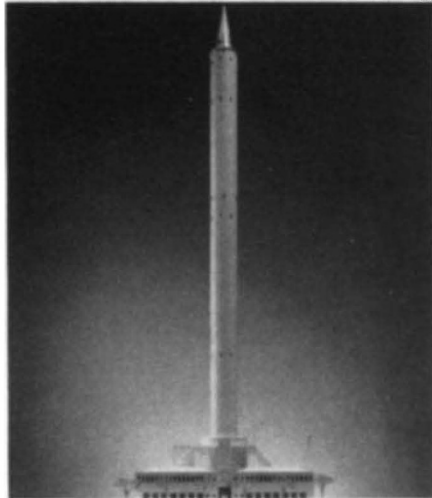
## Neural networks

EUROPE'S research project into industrial uses of neural networks begins in November and will cost £3.5 million, half coming from the European information-technology programme ESPRIT and half from industrial collaborators. The project, called ANNIE (application of neural networks for industry in Europe), involves seven laboratories in Britain, France, Germany and Greece, led by the Harwell Laboratory of the UK Atomic Energy Authority. The aim is to compare neural network technology with conventional problem-solving methods.

C. McG.

## Microgravity tower

WEST Germany will build a 146-m tower in Bremen to allow experiments to be performed under microgravity conditions. Experiments in combustion, fluid mechanics, materials science and biotechnology



Bremen's planned "drop tower".

will be carried out from late 1989. A capsule will fall 110 m down an evacuated steel tube at the centre of the tower, providing weightless conditions for up to 4.74 seconds. Researchers will also be able to launch capsules from the base of the tower, doubling the period of weightlessness. The Research Ministry will provide DM7 million for the tower, which is being built by the University of Bremen. The city of Bremen, the West German Education Ministry and local industry will bear the rest of the DM18.2 million total costs.

S.D.

## Money for Frontiers

JAPAN'S Science and Technology Agency and the Ministry of International Trade and Industry have applied for 2,600 million yen (about \$20 million) for the Human Frontiers Science Program in budget requests submitted to the Ministry of Finance. The funds will be used to establish a foundation in Europe next spring, says Tateo Arimoto of the agency, and the first international grants for research on the brain and molecular recognition and response should be available in 1989.

D.S.