

# Technology growth in French research budget

- Industry gets money and tax benefits
- Aviation and space rewarded

## Paris

NUCLEAR technology in France is 'out' and space technology is 'in', if the 1990 civil research and development budget is any guide. In research minister Hubert Curien's second budget of his second term, only the atomic energy centre (CEA), having "reached maturity", has seen its research funding drop. Against an overall civil budget increase of 7.1 per cent to FF45,353 million (\$7,100 million), CEA loses 4 per cent, and for the first time state spending on space, through both the national space research centre (CNES) and contributions to the European Space Agency (ESA), has overtaken spending on nuclear energy research.

France once had a goal of spending 3 per cent of its gross domestic product on research and development by 1992. Last year the figure was 2.34 per cent, and Curien hopes it will rise to 2.38 per cent next year. But if the date has been dropped, the goal remains, and in this budget, industry is being coaxed into spending more on research, with high-technology projects most likely to win government approval.

The government's expansiveness has been offset by slow overall growth in the economy, a call for strict housekeeping and reductions in the growth of spending on defence and nuclear energy research. France is also reducing its high rate of value-added tax, to bring it in line with other European countries before 1992. The loss of tax revenue means that the gamble that the economy will grow through the support of industry and technology must pay off.

Industry will receive a total of FF5,000 million in benefits, partly in the form of extended tax concessions for research and development (FF2,600 million last year). There will be a 30 per cent increase (to FF1,566 million) in the national technology research fund (FRT) which supports emerging areas such as new materials and biotechnology, and through the industry ministry FF843 million, more than three times last year's sum, will go towards technology innovation, such as the European JESSI superconductor programme and the EUREKA high-definition television venture.

Also on the commercial front, this summer's decision to back a fourth-generation of the SPOT remote-sensing satellite has led to FF352 million being set aside next year out of the expected total cost of FF2,500 million. France is a also major

contributor to the ESA space effort: 45 per cent of the cost of the Ariane-5 launcher will come from the French and this, in 1990, will cost them FF1,812 million. The Hermès shuttle and France's contribution to the Columbus space station account for a further FF747 million destined for ESA next year.

A 16.6 per cent increase for research in aviation technology, to FF2,882.6 million, goes mostly to the successful Airbus civil aeroplane, new engines and a helicopter. But the go-ahead has been given for preliminary research into hypersonic passenger flight to develop a competitor to Britain's revolutionary, if neglected, HOTOL space-plane and the West German Sänger equivalent.

Basic research was given less emphasis in Curien's budget presentation but has not been left out. The 'grands organismes', such as the National Centre for Scientific Research (CNRS) and the National Institute for Health and Medical Research (INSERM) between them account for 53 per cent of the civil research budget and in 1990 there will be increases of between 4.6 and 6.9 per cent for CNRS. The laboratory bench receives priority in the raises: salaries and money for equipment go up, and 432 new research posts and 318 technical and support jobs are being created.

The CNRS, the largest state research employer, gets the biggest share, with FF10,331 million and 305 new jobs. The INSERM grant for 1990 will be FF1,825 million, a 5.6 per cent increase, with 88 new jobs. The Pasteur Institutes in Paris, Lille and in French overseas departments will also have 10 per cent more to spend (a total of FF375 million from the state), with the overseas accent on parasitology and research to combat malaria. The environment, particularly research into climatic stability and the ozone layer, will benefit from an extra 13 per cent for the environment ministry and a 30 per cent increase for meteorology.

As in 1989, AIDS research remains "a priority", with a total FF180 million support for the national AIDS research agency (ANRS), in addition to that available within the major state research organizations. About 58 per cent of ANRS grants will go on basic research, 34 per cent on clinical and epidemiological research — including a major survey of sexual habits in France — and the remainder on public health, social and human sciences research. **Peter Coles**

## Great le(a)p forward

### London

PHYSICISTS at the European particle physics laboratory CERN are jubilant at the success of the first two weeks of experimental runs on the Large Electron-Positron Collider (LEP). With more than 4,000 Z<sup>0</sup> particles detected, they are already preparing their first analyses of this fundamental particle. Before LEP started, only 700 Z<sup>0</sup>s had been detected in all experiments since 1983. Thus, expectations raised at the first trial runs in August, when LEP's first Z<sup>0</sup> was detected after only 15 minutes even though the apparatus was not fully tuned, are being fulfilled. On a good day, 400 Z<sup>0</sup>s can be detected, and further technical improvements should raise this count rate by another factor of 10. By comparison, it is pointed out, the Stanford Linear Collider, previously the leading accelerator in these studies, averages 10 Z<sup>0</sup>s a day.

The LEP data are already sufficient to supersede the SLC measurement of the width of the Z<sup>0</sup> resonance — the range of collision energies over which Z<sup>0</sup>s are produced. Eventually, it is hoped, this parameter will reveal several fundamental features of physics, including the number of neutrino types and the masses of the top quark and Higgs boson. **R.P.**

## Exiles' new foundation

### Paris

CHINESE student leader Wuer Kaixi and an academic, Yan Jiaqui, were 10 days ago at the centre of the largest meeting of dissidents in exile since the Tiananmen Square massacre on 4 June. Some 167 delegates from different countries — including Hong Kong and Taiwan — and over 200 other participants were present at the Paris Sorbonne to launch a Foundation for Democracy in China. The foundation is headed by Yan Jiaqui and Wuer Kaixi and a 15-member council. Its aim is to form an international focus for opposition to the incumbent Chinese government. **P.C.**

## More home comforts

### Bangalore

As part of a government effort to persuade Indian scientists working abroad to return home, a scheme called the Transfer of Know-how Through Expatriate Nationals (TOKTEN) has been launched by the Council of Scientific and Industrial Research Money will be available to pay for qualified expatriates to visit Indian academic institutions and industries, in the hope of generating immediate gains for the host institution as well as promoting links that might draw an expatriate back.

The scheme also aims to find temporary placements for returning scientists and technologists. The creation of new posts is being considered, as are methods for assisting non-resident Indians with the importation of laboratory equipment. **R.R.**