

# UK and Germany put the squeeze on CERN's plans for new accelerator

**Munich.** Last-minute attempts by the British and German governments to impose stringent financial conditions on the construction of Europe's planned Large Hadron Collider (LHC) may bring an element of brinkmanship to next Friday's (24 June) meeting of the council of the European Laboratory for Particle Physics (CERN) in Geneva.

With all 19 member states in favour — at least in principle — of proceeding with the LHC it is unlikely that the council will block approval for the project. The demise of the US Superconducting Super Collider (SSC) means that the LHC would be the world's largest particle accelerator and its best prospect for detecting predicted fundamental particles such as the Higg's boson.

But such approval will not be as automatic as some had hoped, because the CERN management has so far dismissed as unacceptable a German/British proposal to change a vital voting rule for agreeing on the inflation-linked rises in annual subscriptions from member states.

At present such rises, needed to cover the additional costs of personnel and materials,

have to be agreed by a simple majority, although under an amendment introduced two years ago the countries in favour of an increase must contribute more than 55 per cent of the total budget. This rule is intended to ensure that the growing number of smaller member states cannot block the wishes of CERN's main contributors, namely Germany (which provides 22.5 per cent of the budget), France (17.5 per cent), Italy (15.5 per cent), the United Kingdom (13.5 per cent) and Spain (7.5 per cent).

Citing financial pressures at home, both Britain and Germany now want an individual right of veto, and are pressing for a rule requiring any inflation-linked rise to be agreed unanimously. But such a move is unlikely to be welcomed by many other member states, particularly because it would also give a veto to small member countries.

Furthermore, given the expected difficulty in reaching unanimous agreement, the move could effectively hold the budget level in cash terms at 1995 prices for the whole of the LHC construction programme, and the first two years of experiments (1995–2005). This could reduce the purchasing power of



the budget by 30 per cent at a time when CERN already has a large shortfall in cash.

Under CERN's proposed construction programme, the LHC will cost an estimated 2.6 billion Swiss francs (US\$1.8 billion), SFr500 million more than the member states would pay out of their normal, inflation-linked contributions. Christopher Llewellyn Smith, the laboratory's director-general, proposes to make up this shortfall in one of two ways (see *Nature* 366, 714; 1993).

The preferred option would be to raise the money from non-member countries, particularly the United States, Japan and Canada, whose own particle physics programmes have been left in the lurch by the demise of the SSC. Positive signals have come from these countries, particularly from physicists in the United States (see *Nature* 369, 266; 1994); but none want to start negotiations until the LHC has been formally approved.

Lacking such contributions, the second option would be to extend the construction phase by two years, delaying the start of experiments until the beginning of 2005. But CERN is keen to avoid such a delay, as experiments on the current CERN accelerator (LEP) will come to an end in 1999.

Llewellyn Smith wants next week's council meeting to take a clear decision on initiating the construction programme so that he can put these uncertainties to rest. The decision does not have to be unanimous. But CERN is keen for a public show of harmony, as the non-member states it is courting will be present at the meeting as observers.

The final days before the meeting are therefore likely to see some hard bargaining between Llewellyn Smith and the British and German delegations. One compromise could be a temporary agreement to fix contributions in cash terms, in exchange for further trimming of CERN costs — ►

## ... as Spain gets cut-rate membership

**Munich.** A long-standing dispute between Spain and CERN over Spain's membership subscription is likely to be resolved next week with an agreement to give the country a discount averaging 23 per cent over the next five years.

Spain has withheld payments for over two years. It argues that, because of a weak domestic base in particle physics, it has too few staff and visiting scientists in Geneva, and wins less than one per cent of the industrial contracts issued each year, despite contributing 7.5 per cent of the laboratory's budget.

Sympathetic to Spain's severe economic problems, CERN had offered a 20 per cent discount in its subscription over the next five years — provided that it paid its existing debts. Spain is now offering a compromise believed to be acceptable to CERN, under which it will pay its debt by underwriting a bank loan to CERN.

In exchange, Spain will be allowed a decreasing reduction on its subscription over the next five years, starting at 40 per cent in 1994 and ending with 10 per cent in 1998. Spain is to consider setting up a research institute for particle physics.

Six other countries also have a special agreement for reduced subscriptions, loosely based on gross domestic product.

The four new members from central Europe — Poland, Hungary and the Czech and Slovak republics — pay only token contributions. Negotiations are taking place to bring them up to full contribution by the year 2000. But even then they are likely to contribute only a few per cent of the total budget of the LHC.

Greece negotiated a 60 per cent reduction in its subscription in the 1970s by arguing that its scientific community was so weak that it reaped little benefit from its membership. But now both sides agree that Greece's particle physics community has prospered, thanks to training at CERN, and Greece has agreed to increase its contribution, aiming to reach its full level by 2001.

But the most important case is Germany, whose contribution should have risen after reunification. But because the costs of reunification were themselves so high, CERN agreed that Germany's contribution should remain unchanged (at 22.5 per cent of the budget) until 1995, with a possible extension of a further two years. The extension is likely to be a very sensitive issue when it comes up for discussion this year with countries such as France likely to object strongly to any further concessions.

**Alison Abbott**

perhaps by limiting experiments involving the laboratory's smaller accelerators — until the project is reviewed in 1997, when final decisions on the timetable need to be made.

At present, however, neither Britain nor Germany seems willing to drop their demands for new voting procedures. And other countries are worried that this hard-line position could jeopardize the final agreement.

French officials, for example, say they will be looking at the two countries' proposals "with concern" as they want the LHC decision to be made with full assurances of financing. Italy is also worried. "We would regret seeing the buying power of CERN decrease," says Claudio Orsalesi, adviser to the Italian delegation.

Meanwhile, CERN's two host countries, Switzerland and France (the laboratory straddles the border between the two) have announced they are each prepared to accept another UK/German-led demand put forward last year, namely that they should make an increased payment towards the LHC in recognition of the benefits that CERN brings to their local communities.

Both countries say they will make a one-off contribution after 1997 — either in cash or in kind. Switzerland will probably put forward a concrete proposal next week; the French government is still negotiating with the local authority where CERN is based to agree a sharing of cost. **Allison Abbott**

## IBM physicist picked for Trieste centre

London. **Praveen Chaudhari (below)**, a senior physicist at IBM's Thomas Watson Research Centre in Yorktown Heights, and a former head of the company's science programmes, has been chosen as the new director of the International Centre for Theoretical Physics in Trieste.

**Chaudhari** has been with IBM since 1966. He succeeds **Abdus Salam**, who has been director of the centre — aimed in particular at providing training courses for physicists from developing countries — since 1964, and retired at the beginning of this year.

**Chaudhari** is the author of more than 150 technical papers, and is widely known for his work on electronic materials. He has been a senior advisor to both the US and Indian governments, and was chosen from a list of about 20 candidates by the governing council of the ICTP at a meeting held last week at the International Atomic Energy Agency in Vienna. □



# US physicists urged to build links with the modern world

**San Francisco.** A leading US physicist has warned his colleagues that the physical science community is seen as "non-cooperative with a new move to connect science more closely to the needs of society". In response, professional societies will be urged to endorse mission statements emphasizing their contribution to the "long-term opportunity for the nation".

Burt Richter, director of the Stanford Linear Research Center (SLAC) and president of the American Physical Society, told a forum of senior physical scientists earlier this month: "We are seen as recalcitrant, and wanting to go our own way."

In an attempt to correct this impression, the National Research Council (NRC) — the research arm of the National Academy of Sciences — has embarked on an attempt to forge a constructive response from the mathematical and physical sciences to their changing social environment. To start the process rolling, the NRC has sponsored a series of round-table meetings in Virginia, Colorado and California, aimed at hammering out a fresh justification for the American public's investment in the physical sciences to replace the old, unstated rationale of winning the Cold War.

At the Californian meeting, co-sponsored by Stanford University and held in San Francisco, senior academics in mathematics, physics and chemistry were invited to join the heads of government laboratories, Silicon Valley entrepreneurs and White House and congressional staff. Five important themes emerged from a weekend of discussion:

- The physical sciences community is essentially inward-looking. Even its senior members are happier dealing with internal issues, such as course structure, rather than external ones, such as why the federal government should continue to pay its bills;
- The community does face very real external threats, in particular the desire of its paymasters to 'pick winners' and to apply quantitative measures to the returns on investment in research investment;
- The community is sharply divided in its response. Some believe that the US research enterprise is so finely tuned that tampering with it can only do harm; others welcome the external pressure brought by the end of the Cold War as an overdue opportunity for radical change;
- Change, whether radical or gradual, will require physicists, chemists and mathematicians to work with other disciplines, including computer science, engineering and, in particular, the life sciences;
- Change will eventually take university teachers in mathematics, physics and chem-

istry down the road already trodden by the engineering schools, towards more practical course content and industrial experience for postgraduate students.

But even senior faculty from elite schools represented at the meeting were at times uncomfortable discussing the big issues of science policy. A session on the "social contract" between science and society, for example, ended after two minutes when one speaker claimed that no such contract existed.

Bill Harris, head of mathematics and physical sciences at the National Science Foundation, identified one consequence of the community's isolationist tendency. "We sit on the sidelines of this process called democracy," he says. Such non-participation, others pointed out, can extend to the denigration of scientists who follow career paths outside academic institutions.

But outside pressures coming to bear on the physical sciences are not always obvious. MRC Greenwood of the White House science policy office warned, for example, that government performance law coming into force in 1997 will require federal agencies to formally assess programme outputs. "If the science community doesn't participate in developing appropriate assessments, it will become subject to measurements developed by or appropriate to other government activities," she says.

Richard Zare, the Stanford chemist who organized the meeting, favours a balanced response to all these pressures: "If we don't respond, we're dead; if we respond too much, we wreck the enterprise," he says. A rapid response is favoured by those in newer disciplines, such as computer science, who disliked the predominance of mathematics and physics in the old, Cold War system.

The Silicon Valley people at the meeting were generally happy with their current relationships with university science — and with the steady output of a postgraduate education system that they consider unequalled anywhere in the world.

But if the physical sciences have no trouble relating to industry, their relationship with a wider society is more fraught. In one attempt to reach out, Richter and Robert Byer, an applied physicist at Stanford who is president of the Optical Society of America, pledged to get the boards of their respective societies to consider mission statements.

One proposed wording is that "[the society] will focus its capabilities on teaching, research and scholarship to generate knowledge and long term opportunity for the nation". It sounds a small step, but it would be a big leap for scientists who tend to see their role as confined to the pursuit of pure knowledge. **Colin MacIlwain**