

Fermilab's director threatens resignation



FOR a considerable number of years, Europe's high energy physicists have looked enviously at the facilities and resources available to their US colleagues. Recently, however, the pendulum has begun to swing the other way; American physicists, faced with rising costs and conflicting demands on a limited budget, now speak of the need to "keep up with the Europeans".

The most dramatic manifestation of this has been the suggestion by Dr Robert R Wilson, director of the Fermi National Accelerator Laboratory near Chicago, that he will resign his post next month unless the Government provides sufficient funds for early completion of the laboratory's proposed 'energy doubler', a development which would both cut down running costs and allow the laboratory to reach energies of 100 GeV or more.

Wilson stated his position in a letter to Mr James R Schlesinger, Secretary for Energy, whose department is responsible for high energy physics laboratories. Schlesinger's proposed budget for 1979 will be presented to Congress next week by President Carter. And although regarded by some as an attempt at special pleading, Wilson's move has highlighted tensions over the allocation of funds within the high energy physics community.

Fermilab—the "jewel in our crown" as one member of this community puts it—was completed on time and within budget (\$340 million) in 1972. Although designed to carry out experiments at 200 GeV, it has been operating at energies of up to 500 GeV, and was for several years the most powerful particle accelerator in the world. Much important and exciting physics has come out of the laboratory. Only last year, for example, Fermilab announced the dis-

covery of the new *upsilon* particle of mass about 10 GeV. This particle is believed to be similar to the *J/psi* at 3.1 GeV and to herald the presence of a new quark.

Yet it has been estimated that the new SPS proton synchrotron facility at the European Centre for Nuclear Research (CERN) in Geneva, which came into operation at the beginning of last year and currently operates at about the same energy at Fermilab, enjoys almost twice the level of support from research teams financed by the different European countries involved. As a recent article in the Fermilab house journal put it "whereas we welcome the arrival of our friends and co-investigators in the field of 400-GeV physics, we also must be mindful of the competition. There is no point in doing an experiment at Fermilab, quite similar to one being done at CERN, and doing it less well."

"At present, we are doing only about half the amount of physics a year that we could be doing" according to Dr Edwin L. Goldwasser, deputy director of the laboratory. "And in two or three years time, if there is no improvement in funding, we could find ourselves in a relatively weak position internationally." Already it is planned that Fermilab's meson facility is to close for six months for lack of funds.

Saving energy—and thus reducing Fermilab's \$5 million electricity bill—is therefore one of the attractions of the "doubler" project, under which a second ring of superconducting magnets would be constructed using the same tunnel as the existing ring.

According to Dr Goldwasser, a whole new set of experiments would be opened up by such a facility, which would be able to provide proton energies on a target of up to 1000 GeV (43 GeV in the centre of mass). And by circulating particles in opposite directions in the two rings—for example protons and antiprotons—collision energies of 2000 GeV in the centre of mass, at high luminosity, could be reached.

With the major part of the development work carried out, Wilson is now keen to move forward rapidly to the construction phase. "At present the doubler would cost between \$30 and \$35 million, and given this money—which would mean a total budget for the laboratory of about \$120 million in 1979—we believe that the doubler could be completed by the end of 1979" says Dr Goldwasser.

Members of the Department of Energy's High Energy Physics Advisory

Panel, who would recommend the funding, are sympathetic to Wilson's position. There is a widespread feeling that, despite new facilities and continuously increasing budgets, the overall position of high energy physics is precarious. According to Professor Sidney Drell, for example, who is chairman of HEPAP and deputy director of the Stanford Linear Accelerator Center (SLAC) in California, the present level of funding is "perilously low", with virtually all major equipment being underutilised.

In this climate, there is a natural concern that Fermilab should continue to operate effectively and competitively. And HEPAP has suggested that, for the time being at least, the administration should hedge its bets and continue to support all its major accelerator facilities. But the question has become one of deciding relative priorities.

In particular HEPAP has been faced with the choice between upgrading Fermilab's facilities by constructing the "doubler" as Wilson suggests, and providing support for a new facility, the 400 GeV intersecting proton beams project (Isabelle) at the Brookhaven National Laboratory on New York's Long Island.

At present, while emphasising that it is "strongly committed" to both projects, HEPAP's vote for top priority has gone to Isabelle, just as five years ago it recommended that funds for other areas of high energy physics be held back to allow Fermilab to be developed.

HEPAP's position was confirmed at a meeting of the panel attended by both Wilson and Goldwasser in early December (and planned, ironically, to coincide with the opening of a new gallery devoted to particle accelerators in the Smithsonian's Museum of History and Technology, with Fermilab as one of the centre-pieces).

This position is likely to be reflected in the proposed science budget for 1979 which President Carter will offer to Congress next week. In this it seems likely that a major sum will be allocated for Isabelle under the Department of Energy's construction programme, but that the sum earmarked for Fermilab's energy doubler will not be large, and will come from the laboratory's operating budget.

Wilson reaches retirement age next year, and would naturally like to see the doubler well under way—if not finished—before he goes. If the administration's proposed budget does not provide the money for him to do it, then his last chance would rest with the appropriation and authorisation committees in Congress which could—if so persuaded—add an additional earmarked sum.

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