

US research computers

Agency expects funds to buy time

Washington

GRANTS from federal agencies allowing US researchers to purchase computer time are about to become respectable again. President Reagan's budget for 1985, to be published at the end of the month, will include substantial new funds with which the National Science Foundation (NSF) can help grant-holders to purchase time on supercomputers — machines such as the various models of CRAY computers. But the new funds will fail to satisfy at least two of the groups that have been urging that academic researchers should have more ready access to computer power.

One of these is the working group of the National Science Board (advisory to NSF) which last summer recommended that \$200 million should be spent over the next three years on ten supercomputer centres for university researchers. The new NSF programme will fall far short of that proposal, both in the amount of money available and because it is intended that the new funds should be used to buy time on existing machines.

Budget prospects

Dr Edward Knapp, director of the National Science Foundation, refused to comment last week on the other components of the NSF budget, but did say that he expected NSF to do as well as last year. The budget for the current fiscal year, published last February, gave NSF an increase of 18 per cent, the largest increase in a single year in the foundation's history.

Speaking on Monday at the National Academy of Sciences, however, Dr George Keyworth, the President's science adviser, did drop a hint about NSF's plant biology budget in the context of his general optimism about funding for agricultural science. Keyworth said that the plant biology programme at NSF had received a budget increase of 16 per cent last year, up to \$50 million. "I'd look for comparable growth again next year", he said.

Keyworth was not nearly so specific in discussing the competitive grants programme at the Department of Agriculture, although he did reveal that Secretary of Agriculture John Block had discussed the programme directly with the President and had received Reagan's personal support.

Even so, the new programme will mark a major shift of NSF policy on computing. Not since 1972 has NSF supported computer centres on campuses, while most federal agencies continue to balk at paying the full cost of purchased computer time under research grants. During the same period, this policy was abetted by researchers themselves, who preferred to buy their own mini- and microcomputers than to use central computing facilities

which, according to the working group, had fallen into disrepute.

Some of the consequences of that trend have been unfortunate. The National Science Board's working group concluded last summer that "important" research is not being tackled for lack of supercomputer facilities in the United States and cited the case of an astrophysicist who had found he could get access to the computing power he needed only by collaborating with a West German group. Under the new budget proposals, researchers will be able to buy time on CRAY and other computers such as those at Los Alamos and Livermore National Laboratories.

The new programme will nevertheless offend those who greeted the National Science Board's report with scepticism, saying that the supercomputer was a solution in search of a problem — and that the important applications of these machines are few. Meanwhile, an alternative policy is suggested by the work of a group of researchers at the California Institute of Technology (Caltech) who are developing what may prove to be cheap supercomputers. According to Geoffrey Fox, the theoretical physicist who directs the Caltech project, and Charles Seitz, a computer scientist, the few hours of computer time that a researcher may be able to buy with NSF funds will not add significantly to the computer power already at his or her disposal.

French research

Academics between millstones

RESEARCHERS in French universities who receive support from the Centre National de la Recherche Scientifique (CNRS), the principal research council, will soon have to "clarify" their position in relation to the university and CNRS. This follows an agreement last week between CNRS and the ministry of national education (MEN) which seeks to disentangle the sometimes complex relationships between research groups and their sponsors that have grown up through years of benign neglect, and a series of individual, idiosyncratic agreements between CNRS and individual groups.

Whether or not this will be seen to aid research depends the observer's point of view. It will certainly aid research management, and it will also aid university management — for in the past, university presidents have not always known what their own groups were doing. A new contract between a group and CNRS might commit the university to new overhead (providing laboratory space, for example) without the university having had any say in the matter.

On the other hand, however, the situation gave individual scientists the chance to

Fox says that "an IBM personal computer is more cost-effective than a CRAY" and that a few hours of CRAY time will not crack any problem that cannot be solved on a personal computer in a few hundred hours. What worries Fox is that under the new policy, supercomputer time "will be chopped up so that everyone will get a few hours. But you don't chop up Palomar into a pixel for each observer; I've never understood why we do that in computing."

The Caltech approach, according to Fox and Seitz, could give academics access to dedicated supercomputing power by cutting costs dramatically. They have already built a machine using 64 microprocessors of the kind used in personal computers with a power one-tenth of a CRAY machine but at only one-hundredth of the cost (about \$80,000).

The Caltech programming philosophy is also different. While CRAY machines have several processors that operate in parallel when the program-compiler identifies steps in a sequential program that can be executed simultaneously, the Caltech approach would parcel out steps in the solution of a problem to its separate processors. In the 64-chip version of the machine, each processor can communicate with six others and thus be kept running almost full-time.

At Caltech, the next step is to expand the desk-top 64-chip machine to a total of 1,024 chips. This would be equivalent to a CRAY machine in computing power but because of the use of mass-produced chips may cost only one per cent as much.

Stephen Budiansky

play off one part of the bureaucracy against another in the game of raising a grant. Under the new agreement, this will be harder, and there will be fewer corners where researchers not conforming to national policy can find rest.

The outline agreement describes "the ancient links, many and narrow" between CNRS and universities and claims that these justify "an effort of clarification and organization". The two sides have sought "precise texts" and "a common charter", which would be "legal, rational and balanced".

Under the charter, CNRS will draw up a general agreement with each university (or grand école), followed by a series of particular agreements with each group in that establishment, these particulars being placed in the context of the general agreement. The establishment as a whole will bear responsibility for applying the agreement, something that should give a university president more power in his (or her) own house (provided the president can control the new three-committee management structure of the university, a prospect which some French researchers find unlikely).

Robert Walgate