international news

A TOP-LEVEL advisory committee has told NASA that, unless the agency's dismal budgetary outlook improves, it should take a close look at its plans for planetary research and perhaps even drop or defer two important missions to the outer planets in the late 1970s. The panel makes that suggestion reluctantly because it believes that the expensive planetary flights could squeeze out cheaper, but equally important, missions.

The recommendation, contained in a report prepared by the Space Science Board (SSB) of the National Academy of Sciences, is one of several suggestions about what should be the priorities in space research in the coming years. The report is likely to be highly influential in shaping NASA's science programmes because it was produced by a panel of distinguished (read powerful) astronomers and space scientists with the help of a large number of university researchers. It will be published early in February by the academy.

Starting from the assumption that NASA's space science budget is unlikely to grow much, if at all, in the next few years—an assumption which is borne out by recent trends—the SSB has recommended what it calls a balanced programme by assigning priorities to missions which have already been approved by Congress and, more important, to missions which are still in the planning stage. Although the report says nothing about manned space flight or applications satellites, it assumes that the space shuttle will be developed to put large payloads into Earth orbit.

As far as approved projects are concerned, the SSB strongly supports the High Energy Astronomy Observatories, the Pioneer Venus project and the Mariner Jupiter-Saturn mission, all of which have been reduced in scope and delayed by budgetary restraints. Those three missions, the report says, "represent the next opportunities for important advances in space astronomy and in planetary and lunar exploration". The Pioneer-Venus programme, with the launch scheduled for 1978, is however, already in danger of being delayed by several months as a result of budget cuts proposed by President Ford in November last year; Congress has yet to act on those proposals.

As for projects which are still in the planning stage, the SSB recommends

A blueprint for space research

by Colin Norman, Washington

that a start should be made next year on the Large Space Telescope (LST). An optical telescope which would be flown on one of the early shuttle launches, the LST would, according to the SSB, be "an exciting major step in the history of observational astronomy, observational cosmology and the understanding of the Universe". But it would also be extremely expensive. Consequently, the report suggests that NASA should consider a rather less ambitious LST than it had originally planned to develop.

In short, the LST has been envisaged as a 3-m instrument, but the SSB suggests that it should be reduced to 2.4 m. Even that would, however, be able to detect stars ten times fainter than is possible using ground-based instruments, and it would also have a resolution ten times better. Given the bleak budgetary climate, NASA will probably be only too pleased to take the cut-rate option.

The LST would be the only new start for the next fiscal year, but the SSB suggests that NASA should begin developing hardware for eight other new missions in the fiscal year after that. They are a satellite which would be placed in polar orbit around the Moon, analysis of data from the 1976 Viking Mars Lander mission and planning of further Mars exploration, a spacecraft which would be sent into orbit around Jupiter and which would send probes into Jupiter's atmosphere, a spacecraft which would swing past Jupiter and travel on to Uranus, an orbiting telescope to take advantage of maximum solar activity in the early 1980s, a satellite for infrared astronomy, a gamma-ray satellite and finally, a spacecraft for electrodynamic studies.

Unfortunately, however, if all those projects are given the green light in the 1977 fiscal year, expenditures in subsequent years would probably break NASA's budgetary ceiling. The SSB therefore suggests that if NASA's

budget fails to increase, the agency should either delay developing and launching the Jupiter orbiter for four years or it should scrap plans for the mission to Jupiter and Uranus.

Although both of those projects have considerable support in the scientific community, the SSB says that if they are approved at the expense of high priority programmes in other fields, the space science programme would be unbalanced. Because the launch date of the Jupiter-Uranus spacecraft is tied to a rare alignment of the outer planets, that mission could not be delayed.

Between 1978 and 1982, the SSB recommends that NASA should begin work on a variety of other projects, including an imaging radar which would be placed in orbit around Venus, orbiters around Jupiter, Mercury and Saturn, a spacecraft to intercept the comet Encke, another infrared telescope, a 1.2 m orbiting X-ray telescope, and possibly a spacecraft which would travel out of the ecliptic plane.

The report makes clear that there is a difference of opinion among planetary scientists about the exploration of Mars after the 1976 Viking lander mission. The report recommends that a long term goal should be to bring samples of the surface of Mars back to Earth for analysis and inspection, but that the next stage of exploration should be to place a spacecraft in polar orbit around the planet, and to follow that with a probe and hard lander in the early 1980s. An SBB subcommittee on planetary research urged, however, that existing spacecraft should be modified so that another Viking lander could be despatched to Mars in 1981 if the 1976 mission produces particularly exciting results. But the SSB report said that keeping such an option open would be too expensive: "we see no missions . . . that should be displaced to meet such option costs", the report states.

The missions recommended by the SSB would keep NASA's space science budget essentially the same in terms of purchasing power over the next six or seven years, but with inflation running at its present rate and President Ford preaching fiscal restraint, it remains to be seen whether even that modest expectation will prove to be too optimistic. There should be some clues when the Administration publishes its 1976 budget recommendations on February 3. □