

# Cutbacks 'will cripple space station science'

**Tony Reichhardt, Washington**

The scaled-down International Space Station (ISS) currently proposed by NASA — with only three astronauts on board and very limited resources — would be able to do very little high-priority science, according to a review of research planned for it.

If the curtailed design is not enhanced, “NASA should cease to characterize the ISS as a science-driven programme”, charges the Research Maximization and Prioritization (REMAP) task force, which presented the outcome of its four-month assessment to NASA’s Advisory Council on 10 July.

Startled members of the council warned that the assessment could lead to the abandonment of the lumbering, 18-year-old project. “If I were in the White House,” says council member Tom Young, a retired aerospace executive, “I would take this as a recommendation to terminate the existing space station.”

But most political observers say that it is too late for that, and that some version of the station will be completed. The White House budget office last year ordered NASA to plan for a three-member station crew, instead of a more capable six- or seven-person version, unless it can manage the project — currently at least \$5 billion over budget — more tightly (see *Nature* 410, 399; 2001). The decision drew protests from scientists and from the station’s international partners, including the European and Japanese space agencies.

Commissioned by NASA and chaired by Columbia University biopsychologist Rae Silver, REMAP was asked to set research priorities for the agency’s Office of Biological and Physical Research (OBPR), which sponsors most of the station’s planned experiments.

Surveying the broad portfolio of physics and biology research sponsored by the OBPR, the 20 members of REMAP gave “highest priority” ranking to more than a dozen subdisciplines, including studies of radiation health, crew behaviour and advanced life support. These were deemed either to have intrinsic scientific merit or to offer help for enabling future human space travel. Lower priority was given to experiments in protein-crystal growth, which have been criticized by other review groups (see *Nature* 404, 114; 2000).

After determining the rankings, REMAP worked with the OBPR on an implementation plan — with discouraging results. By NASA’s own estimates, a three-person crew could handle only a small fraction of the ‘high-priority’ research. Key resources, such as electrically powered ‘lockers’ for experiments, would be in critically short supply. Limiting the space shuttle to four flights a year, which has been proposed as a money-saving move, would leave almost no room



Up in the air: limiting the ISS’s crew to three would leave onboard science struggling for resources.

for science equipment on station resupply missions. And two key pieces of lab hardware — a centrifuge for varying g-forces, and a holding facility for animals and plants — are in danger of being delayed or scrapped.

This has led REMAP to conclude that the scaled-down station would not be the lab that NASA originally envisioned. Some high-priority science could still be done on board, Silver says, but the station could no longer count research as its primary function.

Former astronaut and US senator John Glenn, a member of the advisory council, says

he is worried that the report will “be used as material to kill the whole programme”.

But Silver is hopeful that policy-makers will respond to the assessment by improving the specification of the station so that it can be used for valuable science. She says she is encouraged by the fact that NASA’s administrator, Sean O’Keefe, has repeatedly encouraged her task force to identify the best science that could potentially be done on board the station, without worrying about the constraints that the scaled-down design would impose. ■

## NASA aims to reach Pluto by 2020

**Tony Reichhardt, Washington**

Sending a spacecraft to Pluto and the distant Kuiper Belt should be the United States’ top priority in Solar System exploration, according to a ‘decadal survey’ of planetary science — the most thorough attempt yet to set a long-term agenda for research in the field.

NASA already is heeding the advice, released on 11 July by the National Academy of Sciences, and hopes to fund the on-off New Horizons mission (see *Nature* 414, 571; 2001) to reach Pluto by 2020, according to Colleen Hartman, who heads the agency’s Solar System exploration office.

The review is meant to build on the successful tradition of decadal reports for astronomy and astrophysics, which have been influential in guiding US government funding (see *Nature* 405, 381–382; 2000).

The proposed agenda for 2003 to 2013 calls for three classes of planetary missions.

Small (less than \$325 million) missions would essentially continue NASA’s existing Discovery programme, which has sent spacecraft to study asteroids and comets. The medium-sized (up to \$650 million) category roughly matches the agency’s New Frontiers line introduced this year, and would include the mission to Pluto and the Kuiper Belt, as well as a spacecraft to return samples from the Moon’s south pole.

The most controversial recommendation is to revive the kind of large, expensive (more than \$650 million) flagship missions that NASA abandoned in the 1990s. The panel, chaired by planetary scientist Michael Belton of Belton Space Exploration Initiatives in Tucson, Arizona, picked a spacecraft to explore Jupiter’s moon Europa as the first entry in this category. Belton says that NASA’s projected budget should allow for one such project every ten years or so. But Hartman says that the money isn’t there. ■