

Space station design falls hostage to US–Russia missile deal...

Washington. The design of the space station being planned by the National Aeronautics and Space Administration (NASA) seems likely to be shaped more by what the United States feels it must offer the Russians in return for their signature on the Missile Technology Control Regime — an agreement to stop the spread of weapons technology — than by engineering or scientific considerations.

A final design for the proposed 'international space station' being negotiated between the United States and Russia will not now be ready until 22 December, NASA administrator Dan Goldin told a congressional hearing last week. And according to congressional aides, it will not be finalized until Vice President Al Gore visits Moscow after the Russian elections in November.

Goldin was speaking after his return from a visit to the Russian capital that coincided with the bloody showdown on Moscow's streets. He said that he had been strongly impressed by the commitment of the Russian team which had negotiated with him on the details of the recent US–Russia space cooperation agreement (see *Nature* 365, 101; 1993) against a backdrop of gunfire.

But he told a House of Representatives space subcommittee hearing that he had not yet discussed the space station, the third phase of the three-part deal, with the Russians. "Right now we've only talked about phases one and two", he said.

The space station is due to be discussed at another set of meetings this week, Goldin said. Under Gore's plan, the latest design for the space station will be presented to the White House by NASA on 1 November.

The first two phases of the US–Russian space deal are bilateral agreements. But the third phase is meant to involve the United States' existing space station partners — namely Japan, Europe and Canada — as well. NASA officials were in Paris last week briefing the European Space Agency on their progress with the Russians.

At an earlier hearing of the space subcommittee, John Gibbons, President Clinton's science adviser, was pressed on why he had no details of the plan. In reply, Gibbons said he did not expect to see an agreement as such on 1 November. "I expect to see a set of options", he said.

Goldin appeared to admit his frustration at the way the decision on the final space station design is being drawn out. "I do not have full control of this process", he said. "I will just deliver the data."

The lack of information on the agreement with the Russians has angered congressmen who fought to save the space

station from budget cuts this summer — eventually prevailing in the House by 216 votes to 215 — only to find it once again bogged down in yet another redesign.

Goldin says NASA is now working on two programmes. One is the space station Alpha as accepted by Clinton in the summer, the other is the 'international' station involving the Russians. Boeing has already been named as prime contractor; but it will not now be told what it has to build until next March.

In testimony from the Congressional Research Service, space specialist Marcia Smith described the Gore plan as "fundamentally a foreign policy decision, not a choice based on space policy". Smith said that merging the space station with foreign policy objectives was likely to "complicate, rather than complete" the programme.

Meanwhile, the technical problems resulting from the US–Russia deal continue to mount. For example, in order to reach a station repositioned to suit the Russians, shuttle launches from Florida would have to fit in a five minute 'window' each day.

Goldin and Gibbons do not consider this a problem. But James Sensenbrenner (Republican, Wisconsin) says that only 30 out

of 86 shuttle launch attempts so far would have coped with such a restriction.

More importantly, the death of the Advanced Solid Rocket Motor in Congress two weeks ago leaves the United States with a lower shuttle launch capacity than its earlier plans had assumed.

The biggest question mark hangs over the wisdom of allowing the fate of an international programme that has already been almost destroyed by the vagaries of the US Congress to depend on the even greater vagaries of Russian politics.

In reply to a question from Tim Roemer (Democrat, Indiana) on what would happen if the Russians breach the missile treaty at some future date, Goldin said: "We'll have a back up as part of our planning process." Congress is unconvinced: in the words of one aide, such a "twin track" policy is "absolutely not possible".

If this is the case, then the Clinton administration may have to wait for political stability in Russia before it can proceed with the space station. But station supporters in Congress are asking whether such stability is likely to be assured by the time they next have to justify funding for the project in nine months time. **Colin Macilwain**

... as Europe plans solo comet trip

London. The European Space Agency (ESA) is expected to give its formal approval next month to plans for the launch in 2003 of the first spacecraft to land scientific instruments on the surface of a comet. US scientists are being invited to participate; but the project will not, as originally intended, be run jointly with the US National Aeronautics and Space Administration (NASA).

The so-called Rosetta mission — named after the complex hieroglyphs found on the Rosetta stone in Egypt — will send a spacecraft to fly alongside a comet, most likely Schwassam-Wachmann 3, as it passes through the Solar System and eventually swings around the Sun. It will form the third of four 'cornerstone' missions that have been planned as the basis of ESA's space science programme since these were agreed in the mid-1980s.

Original plans for the mission were drawn up jointly between scientists at ESA and NASA, with the costs of up to \$2 billion to be split on a 40:60 basis. Funding from the two agencies was to have supported a more ambitious mission, including a vehicle that would have returned samples of the comet's surface to Earth for analysis.

Last year, however, following indica-

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Rosetta: a 'cornerstone' mission (artist's impression).

tions from NASA that the US contribution was unlikely to materialize, ESA agreed that the sample-return element was not essential to the mission's success, and that many of its scientific goals could be achieved by a more modest mission.

It was also accepted by ESA that European development work on solar arrays meant that it would no longer be necessary to rely on US technology to power the space

vehicle during its initial encounter with the comet while at a long distance from the Sun.

The mission has been redefined without the sample-return element, reducing its costs to an estimated 600 million units of account (US\$720 million). But its technical feasibility, scientific value and reduced cost are now such that European scientists are confident the mission can be accomplished without the aid of NASA.

As a result, ESA's space science advisory committee decided at a meeting last month to recommend an earlier than anticipated launch date of 2003, with the initial comet rendezvous scheduled for 2008.

The main space vehicle will travel in parallel with the comet until the two reach the comet's perihelion in 2011. Proposals are now being discussed with scientific groups and funding agencies in various countries — including the United States, Russia and Japan, as well as ESA member states — to build instruments for a separate vehicle that would be dropped on to the comet's surface to make physical and chemical measurements.

Planetary scientists are pleased with the priority now being given to the Rosetta mission. "I am very excited by the prospects", says Eberhardt Grün of the Max Planck Institute for Nuclear Physics in Heidelberg, who has been working on plans for the mission for almost ten years.

US scientists, frustrated by NASA's decision last year to drop funding for its own proposed comet rendezvous mission, CRAF, are also looking forward to the opportunity they are being offered to participate in a cometary mission, even one in which Europe will now be setting the timetable.

"For example, an instrument developed for the CRAF mission designed to send back images of the surface could now be used on Rosetta", says Thomas Ahrens of the Seismological Laboratory at the California Institute of Technology, one of the main authors, with Grün, of a 1987 report outlining the scientific goals of the mission.

The main disappointment will come from European astronomers, however, who had been hoping that the third cornerstone launch slot would be given to the Far Infrared Submillimetre Wave Telescope, FIRST (the first two slots are for the SOHO/Cluster space vehicles, and the XMM telescope).

After a presentation of both Rosetta and FIRST, ESA's advisory committee decided at last month's meeting to recommend that the Rosetta mission be launched first, in which case the telescope will not be launched until at least 2006. One factor said to have influenced the committee's decision is that there are a number of astronomy missions already waiting to be launched.

Both decisions are expected to be endorsed by ESA's science programme committee when it meets in Paris on 4 November to discuss the advisory committee's recommendations.

David Dickson

Italy cuts research funds but adds university jobs

Rome. The Italian government is to create thousands of new university teaching and research posts to meet rising student demand, even though it is planning to cut the national research budget by 3 per cent — and is recommending even larger cuts in its direct funding of university research.

The cuts are being imposed as part of a package of stringent measures intended to deal with the country's economic crisis. Nevertheless, Umberto Colombo, the research minister, has managed to implement a decision made as part of a previously agreed three year plan for 1991–93 (but blocked by bureaucracy) to increase the number of permanent university staff.

As a result, funding for 1,250 full and associate professors, and for 2,000 research staff, will be allocated to universities by the end of the year. Discussions are taking place between the Ministry of Universities and Research, the National Research Council and universities to decide the precise number of new posts to be given to individual institutions.

In a separate move, universities and research institutes were told two weeks ago that they are to be exempted from the government's freeze on all recruitment to civil servant posts, allowing them to fill existing vacancies.

Both measures have been prompted by the fact that the number of Italian university students has tripled in the last 25 years, to a total of 1.5 million. But over the same period, there has been no accompanying increase in teaching staff; the number of professors, for example, has remained essentially unaltered at 45,000.

Despite staffing improvements, the government is recommending that the funds universities devote next year to research should be reduced by 15 per cent on 1993. Colombo has long criticized universities for using these funds in an unfocused way without adequate targeting (see *Nature* 364, 473; 1993).

But Colombo also points out that he is now giving universities more control over

Research institutes facing funding cuts

	1993	1994
National Research Council	1110	1050
Italian Space Agency	850	800
Nuclear and Alternative Energy Agency	600	550
National Institute for Nuclear Physics	440	400

All figures in billions of lire.

the way they allocate their budgets, which will be provided by the government as a lump sum. This means that they can choose to increase the government's suggested budget for basic research with funds saved from other administrative areas.

The overall research budget is likely to be at least 3 per cent lower than last year. The first round of cabinet debate on the budget has left the research ministry with much less than it had hoped for. As a result, says Colombo, "small sacrifices will have to be made in nearly all areas". But he says that, in comparison with other ministries, which have had to accept cuts averaging at about 6 per cent, research has not done too badly. The budget should receive final approval from the parliament by the end of the year.

Colombo also points out that he has managed to secure an increase in funds for capital investments in research facilities. These will allow for the completion on the national Synchrotron Radiation Facility in Trieste, and building of the national telescope Galileo.

Luciano Maiani, head of the National Institute for Nuclear Physics (INFN), says that the cuts hurt, but acknowledges that they have been made necessary by the economic situation. But he says that INFN will be able to absorb the cuts without a major impact on its research activities.

The INFN, which runs four institutes and 12 university research units with at least 800 scientists, is now in the first year of a five-year plan introduced by Maiani. His budget for next year has now been cut back by 10 per cent.

To meet the new budget targets, Maiani has delayed two long-term projects to construct powerful heavy-ion accelerators. But time has also been bought by continuing delays to the proposed Large Hadron Collider (LHC) at the European particle physics laboratory (CERN) in Geneva, now expected to be ready by 2001 if it is approved at CERN council this December.

As a result, INFN has been able to put back the construction of LHC detectors for which it is responsible. And Maiani says that he has been reassured by — even though he is not counting on — promises from the ministry that the 10 per cent cut will be made up over the following two years.

Allison Abbott



Research minister Colombo (top) and INFN director Maiani.