

NEWS

Mars missions face cost crunch

In Europe and America, future missions are in doubt.

Europe's next Mars mission launch looks likely to slip from 2013 to 2016. And budget overruns on NASA's next Mars rover threaten future missions there and elsewhere.

The European Space Agency (ESA) is having problems paying for an ambitious redesign of the science suite of its planned ExoMars lander, which consists of a rover with a drill and a stationary observational platform. The changes were decided in spring 2007 by ESA's programme board for human space flight, microgravity and exploration, raising the mission's estimated cost from €650 million (US\$890 million) to between €1 billion and €1.2 billion. That cost hike must be approved by participating nations next month at an ESA ministerial meeting.

Italy, which contributes nearly 40% of the cost of ExoMars, had originally supported the increase. But following last April's election, the new government says it will not give any additional money. Germany is also resisting the price hike. "The solution in my mind can only be to have a redesign of the overall mission," says Johann-Dietrich Wörner, chairman of the DLR, Germany's space agency.

The immediate cash shortfall is nearly €100 million. If more money can't be found within a month, the mission will probably not launch in 2013, which could increase its costs by at

least 10% and might derail it entirely. "This is make-or-break," says David Southwood, ESA's science director.

Southwood hopes that Britain, which at 15% is among the largest contributors to ExoMars, will help make up the shortfall created by Italy. But David Williams, director-general of the British National Space Centre, which oversees UK involvement in space missions, says "I don't think there's much chance of that". France has said it will increase its own percentage but not make up for other countries' deficits.

The trouble for ExoMars comes at the same time that NASA's Mars Science Laboratory (MSL) is facing its own financial difficulties. On 10 October, MSL officials met NASA administrator Michael Griffin to review the mission's progress, and decided to push ahead with a 2009 launch despite budget problems. Estimated in 2006 to cost \$1.6 billion, the price now looks likely to be more than \$2 billion.

Engineers at the Jet Propulsion Laboratory (JPL) in Pasadena, California, are building the rover, and part of the cost problems lie in the new technologies being designed for the MSL, says Doug McCuiston, director of NASA's Mars exploration programme. These include actuators, the motors that drive the

spacecraft's wheels and robotic arm. Ed Weiler, the agency's associate administrator for space science, says that MSL engineers did not accurately estimate how much time and money would be needed to develop these and other elements of the rover. Staff overtime is also running over budget. Some \$1.5 billion has already been spent on the MSL.

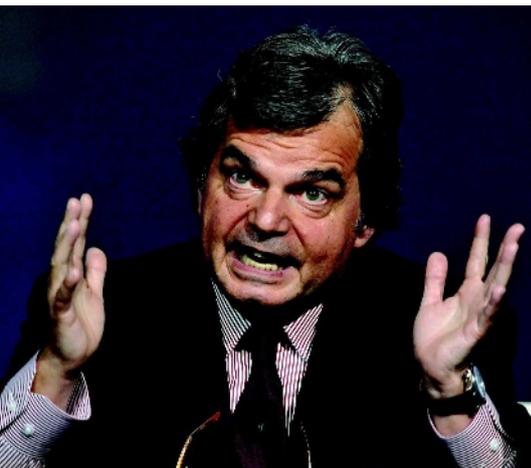
Weiler says NASA will first look at the timelines for other missions under development, starting with other Mars missions and then missions to other planets. The latter could include the Jupiter mission Juno and the lunar orbiters GRAIL and LADEE. For now, principal investigators for the other missions have been told to proceed with mission planning as scheduled, says Maria Zuber of the Massachusetts Institute of Technology in Cambridge, who leads the GRAIL team.

Jack Mustard, a planetary scientist at Brown University in Providence, Rhode Island, says many feel that JPL hasn't been able to prove its ability to predict costs accurately. Giving them more money, he says, "is like enabling your drunken cousin".

JPL had asked for and received an additional \$200 million this spring, and is now expected to need about \$100 million more in 2009. "There are only so many times that this institution can run into these problems and expect forgiveness," says Jim Green, director

"This is make-or-break."

New law threatens Italian research jobs



Renato Brunetta has lambasted the civil service.

Nearly 2,000 Italian researchers will lose promised permanent positions under a law that is expected to come into force by the end of the year. They may have to leave public research altogether.

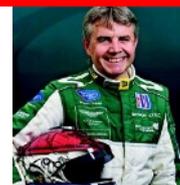
Last week, the chamber of deputies in Silvio Berlusconi's new centre-right government considered the bill, which is intended to reduce public spending by streamlining the civil service. Several researchers have put themselves up for sale on eBay, as part of a campaign that has also involved tens of thousands of protesters marching through the streets of Rome and other cities.

The proposed law explicitly reverses another law passed by the previous, centre-left government, whereby long-term

temporary research employees could be taken on permanently if they were suitably qualified. As it also prevents scientists from being employed on sequential short-term contracts, those already selected for permanency who have had more than three years of contract in the past five years will now be let go.

Renato Brunetta, the minister for public administration and innovation who designed the new law, has enraged scientists further by referring to many civil servants as *fannulloni*, or 'idlers'.

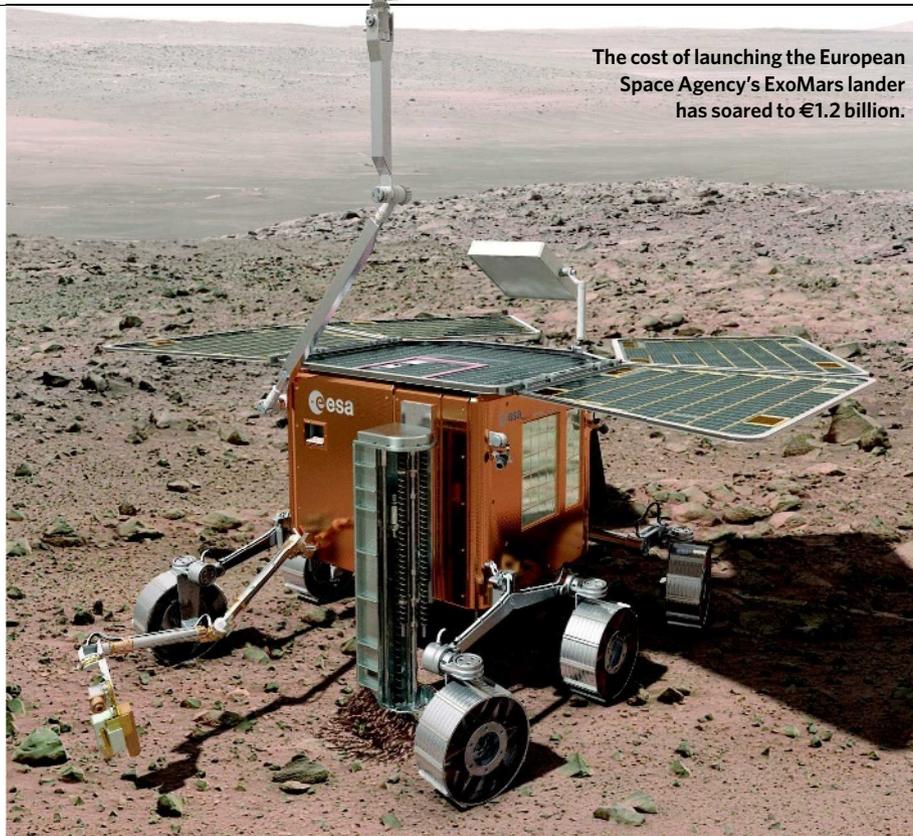
Researchers in Italy are civil servants, and the number of positions available is determined by the central government rather than by individual research agencies. The past decade has seen almost



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The cost of launching the European Space Agency's ExoMars lander has soared to €1.2 billion.

No more third time lucky

The US National Institutes of Health (NIH) announced last week that biomedical researchers will be able to amend and resubmit a failed funding application only once. Applicants whose grants are unfunded after the second submission may reapply only after designing a new proposal.

The new guidelines, effective from 25 January 2009, are part of an NIH overhaul of the peer-review system for evaluating grant proposals. That system previously allowed applicants two chances to resubmit rejected proposals. Earlier this year, the agency mooted doing away with resubmissions, but decided against it after an outcry from researchers (see *Nature* 453, 835; 2008).

The NIH estimates that the move will reduce the number of applications by up to 5,000 — welcome news as it struggles to evaluate about 55,000 applications this year.

Grants are increasingly awarded only after they have been through several rounds of submission — in 2007, only about 30% of awards were granted to first-time submissions — and some think resubmission has directed funding towards less competitive proposals. “The study sections may feel ‘we’ve tortured this person long enough,’ and fund them out of sympathy,” says Keith Yamamoto, a molecular biologist at the University of California, San Francisco, who co-chaired a panel tasked with evaluating the NIH’s peer-review system.

Toni Scarpa, director of the NIH Center for Scientific Review, says the new policy will remove delays to funding the most worthy projects, and calls it “a moral imperative”.

But some researchers object to the change. Gregory Petsko, a biochemist at Brandeis University in Waltham, Massachusetts, says the system discriminates against young investigators who may need more guidance with their applications. Others view the resubmission process as a way for equally meritorious applications to wait their turn for funding in a time of tight NIH budgets.

The new guidelines could stifle worthy projects, says Beatrice Hahn, an HIV researcher at the University of Alabama, Birmingham. “What are we supposed to work on thereafter?” she says. “Although well intentioned, this change will cause major problems in the current funding crisis.”

Heidi Ledford with additional reporting by Erika Check Hayden

of NASA’s planetary science division.

NASA administrators and MSL personnel will meet again in early January to review the mission’s progress. If the MSL doesn’t look as if it will be ready to launch in 2009, it may be delayed until 2011.

The fate of other Mars missions, including

the MAVEN orbiter slated for a 2013 launch and a lander planned for 2016, remains up in the air. And the idea of scooping up a sample of Mars soil and returning it to Earth might be pushed back until as late as 2022.

Geoff Brumfiel and Ashley Yeager, with additional reporting by Eric Hand

no new recruitment, and the number of temporary research staff has consequently rocketed. There are at least 4,500 long-term temporary staff — known as *precari*, in reference to their precarious positions — who stumble from one short-term contract to another.

The scientists say that their protest is not directed against the conventional postdoc system, but against the unhealthy ratio of temporary to permanent staff. “We have pathological numbers because new long-term positions have been blocked,” says Luciano Maiani, president of the CNR, Italy’s national research council.

As a result of the protests, Brunetta says that researchers will be given until 1 July 2009 while he investigates their claims. But presidents of the various Italian research agencies believe that the only way out of the situation is for the agencies to have more autonomy from the civil service.

“The government should recognize the highly specific professionalism of the research personnel — it is not appropriate for them to fall under civil-service rules,” says Enzo Boschi, president of Italy’s National Institute of Geophysics and Volcanology.

Claudio Gatti is a particle physicist at the National Institute of Nuclear Physics in Frascati who stands to lose a promised permanent job under the proposed law. He says that “in the Italian research system there’s no planning, no mobility, no future — but we are ready to fight for our rights with every legal means available to us”.

Research and education minister Mariastella Gelmini has not commented publicly on the situation, and did not respond to requests from *Nature* for comments.

Emiliano Feresin and Alison Abbott
See Editorial, page 835.