Space

NASA missions: late and expensive

Most large NASA missions have an average delay of almost a year and are launched over budget, according to a report by official US spending watchdogs. The Governmental Accountability Office (GAO) found that of 13 missions for which NASA provided figures, 10 were delayed by, on average, 11 months and cost 13% above the original estimates. Two of the other projects came in on schedule and under budget, while one was delayed but stayed on budget.

The mission with the biggest overspend is NASA's \$347m Glory satellite (see p6), which is designed to look at aerosol and black carbon soot levels in the atmosphere. First conceived in 2003, it will cost 53% more than originally planned. "We experienced difficulties in the development of instruments, which impacted on the launch readiness and the costs," says Bryan Fafaul, Glory project manager. Also hard hit has been the Mars Science Laboratory, which was recently delayed by two years and is now estimated to cost \$2.3bn, up by \$700m from its initial estimate of \$1.6bn.

Of the 13 projects, the only two that come in on schedule and under budget are the \$300m Wide-field Infrared Survey Explorer (WISE) and the Dawn spacecraft. WISE is set to launch in November to perform an "all-sky" survey in the 3–25 μm wavelength range and has cost 1% less than planned, while the \$465m Dawn spacecraft was launched in

Analysis of NASA projects

Mission	Cost change	Launch delay (months)
Aquarius	6%	10
Dawn	–2%	0
Fermi Gamma-ray Space Telescope	5%	9
Glory	53%	6
Herschel	13%	20
Kepler	25%	9
Lunar Reconnaissance Orbiter	0%	6
Mars Science Laboratory	26%	25
National Polar-Orbiting Operational Environmental Satellite System Preparatory Project	19%	26
Orbiting Carbon Observatory	18%	5
Solar Dynamics Observatory	1%	17
Stratospheric Observatory for Infrared Astronomy	3%	9
Wide-field Infrared Survey Explorer	–1%	0

2007 – 2% below initial estimates – to visit the dwarf planet Ceres and a large asteroid.

NASA did not give the GAO data for five missions, including the James Webb Space Telescope, the Hubble Space Telescope's successor, which is expected to launch in 2013, as well as the Ares crew launch vehicle and the Orion exploration capsule, which are expected to take astronauts to the Moon. The GAO has not, however, made recommendations about what should be done to reverse the current trend.

Michael Banks

Ethics

Physicist accused of misappropriating NASA funds

Government investigators have accused an Iranian-born physicist of defrauding US taxpayers by transferring millions of dollars of grants from NASA and other agencies into his own bank account. Samim Anghaie, founder and director of the University of Florida's Innovative Nuclear Space Power and Propulsion Institute (INSPPI), has been accused of receiving funds worth a total of \$3.4m, which his family then spent on cars and land.

Papers filed in court after an FBI raid on Anghaie's INSPPI offices assert that he received funding from NASA, the US Air Force and the US Department of Energy on the basis of 13 fraudulent proposals for research contracts. The contracts all went through New Era Technology, a company Anghaie set up in 1988 with

Under investigation
Samim Anghaie.

other family members.

Responding to the charges, the university has placed Anghaie, who has published more than 500 journal papers and has served on top-level advisory boards for NASA and the Department of Energy, on paid leave. "The university is collaborating with representatives from NASA and the FBI," says Steve Orlando, a spokesperson for the University of Florida.

The institute's grants have already run out, and Orlando says that the university is waiting for the affair to be settled before deciding the institute's future. The staff member and graduate student who worked with Anghaie at the INSPPI have now moved to new positions in the university.

Peter Gwynne
Boston, MA

Sidebands

CERN marks 20 years of the Web

Researchers at the CERN particle-physics lab near Geneva celebrated the 20th anniversary of the invention of the World Wide Web last month. The main speaker was Tim Berners-Lee, who in 1989, when a software engineer at CERN, wrote a now-famous proposal to his manager Mike Sendell outlining his vision of "information management" at the lab. Berners-Lee's proposal is considered one of the foundations from which the Web was built and led to the creation of the coding language HTML. Speaking at the event, Berners-Lee, who originally studied physics at Oxford University, said that "CERN has come a long way since 1989, and so has the Web, but its roots will always be here".

Finland publishes space strategy

Finland's national space strategy should concentrate on Earth observation and satellite positioning, according to a report submitted to the Finnish government last month by the country's space committee. Climate-change research topped a list of activities that would benefit from better-funded space technology, but the report also urged the country's industries to invest in space-related applications, citing a radio receiver built for Europe's Planck satellite (see p8) by the Danish space-technology firm DA-Design.

China outlines lunar programme

China plans to launch a robotic Moon lander by 2013 according to Ye Peijian, the chief designer of Chang'e-1 – China's first Moon orbiter, which was launched in October 2007. Peijian also says that China will launch a mission in 2011 to test "soft" landing techniques and risks, and that the country will send a sample-return mission to the Moon by 2020.

Oxford Instruments honoured

The UK-based firm Oxford Instruments, which makes cryogenic equipment and superconducting magnets, has won this year's Private Limited Company (PLC) award for "best technology company". The PLC awards, sponsored by Price Waterhouse Coopers, the *Financial Times* and the London Stock Exchange, are given to smaller firms listed on the stock market.