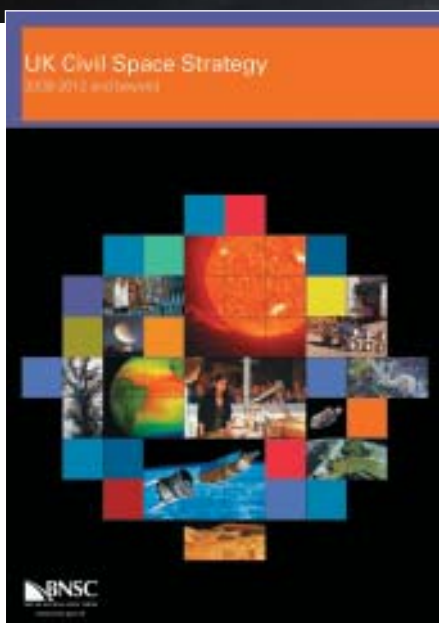


Opportunity knocks for UK in new space strategy

Astronauts and inspiration – or lost in space?

by Clive Simpson

The UK Government is to launch a formal review into whether British astronauts should take part in the future international exploration of space. The review - prompted by growing fears that the UK might lose out in the next wave of human space travel to the Moon - is a recommendation in the new UK Civil Space Strategy published on 14 February. The BNSC-led astronaut study will take into account the scientific, technological and economic costs and benefits of human spaceflight, and report to Innovation Secretary John Denham, probably by the end of the year.



Cover of the 'UK Civil Space Strategy: 2008 – 2012 and beyond'.

New proposals for the UK's future involvement in the increasingly competitive international space sector were published in the 'UK Civil Space Strategy: 2008 – 2012 and beyond'.

It was officially unveiled at a private dinner in the House of Commons for a handful of invited journalists, hosted by Ian Pearson MP, the UK science minister, and David Williams, director general of the BNSC.

Under the new strategy an international space centre will be created at Harwell, Oxfordshire, to focus on climate change and robotic space exploration.

The UK would also continue to be involved in Earth observation, space science and telecoms developments. And it would have closer involvement in international initiatives on the future shape of space exploration to the Moon, Mars and beyond.

"Space technology is a vital part of our everyday life, and satellite communications and space technology provide strong business opportunities for the future," said Pearson.

"Applications from space underpin today's major business sectors. They provide essential information to understand the Earth's environment, changing climate and weather and they enable great strides to be made in the scientific understanding of our solar system and beyond, and, provide innovative tools for enhancing our quality of life," he added.

"The UK is at the leading edge of these activities and the Government is determined that the UK remains at the forefront of the evolving space scene."

The human spaceflight review follows up on a report by the expert Space Exploration Working Group (SEWG) last year which



UK-born NASA astronaut Piers Sellers during the STS-121 Space Shuttle mission's third and final EVA in July 2006. NASA



Ian Pearson MP, science minister.

recommended that Britain should abandon its opposition to manned space exploration and launch its first astronaut as early as 2012.

The UK is the only G8 country not to have a manned space programme and spends around £220 million a year on civil space activities - a quarter of the amount spent by other European countries like France, Germany and Italy.

Leadership

The key points of the strategy, with the stated object of keeping the UK at the forefront of the rapidly expanding space sector, are:

- Continued UK involvement in Earth observation, space science and telecoms developments
- Establishing an international space facility

at Harwell, Oxfordshire, which will focus on climate change, robotic space exploration and applications

- Closer involvement in international initiatives on the future shape of space exploration to the Moon, Mars and beyond, and
- Setting up a National Space Technology Programme to support the development of new, innovative technologies and services.

The British National Space Centre (BNSC), which co-ordinates the UK's civil space activities, and its director general David Williams, have been tasked with providing the leadership to take forward the strategy.

The Royal Society broadly welcomed the new UK space strategy but, while praising the vision, Sir Martin Rees, president, questioned whether the strategy provided the means to deliver the vision.

He said: "The new civil space strategy is

strong on its vision of the UK's role in space, yet there are few signs of the action required to deliver that vision. The Government has hinted at reforming the way BNSC is run but unless that results in a strong, well funded, high profile body we will continue to miss opportunities both at home and for international collaboration.

"The research park at Harwell and the National Space Technology Programme are steps in the right direction. They are the sort of commitments that will allow the UK to get the most from the expertise that we possess.

"However, alone they are not enough. To be internationally competitive in space science the UK must invest in a full range of activities from education through to the realisation of technologies."

Economic benefits

The UK already has a hugely successful space industry specialising in communications and remote sensing satellites as well as building key parts of scientific probes.

It makes £7 billion a year for the economy and supports 70,000 jobs. By 2020 the global market for space technology is set to increase tenfold from £62.5 billion to £543 billion.

But the competition for a share of the pie is hotting up with China and countries like India and even Brazil ramping up their space



David Williams, director general of BNSC.

programmes with the direct support of their governments.

The new UK space strategy notes this but it gives no firm commitment to future projects and no financial numbers at all. So far the UK space industry, fledging or otherwise, doesn't get any guarantees of help to beat off the competition.

Richard Peckham, business development director for EADS Astrium UK, said: "We think the strategy is a step in the right direction but it probably lacks a little bit of ambition - it could have gone a little further.

"On a few key programmes, although they are mentioned, there is no commitment to spend and we don't know how much is going to be spent."

British astronauts

Many space enthusiasts were disappointed to learn that the new strategy had little to say about long-held aspirations for British astronauts.

The UK decided under the Conservative government of Margaret Thatcher in 1986 that human spaceflight wasn't worth investing in from a commercial standpoint.

"The UK now has to decide where the competitive advantage is, where's the science case, and where is the best place for the UK to position itself," said Pearson.

Last year several key groups of experts, including the Commons science committee and the SEWG panel commissioned by the BNSC, warned that Britain risked being left behind if it did not end its long-standing opposition to human spaceflight.

The failure to back a British astronaut programme dismayed some experts who

believe Britain is close to missing any chance of being involved in European and US plans to send humans back to the Moon.

"There's no commitment at all in this strategy. We're the only developed nation that doesn't have an astronaut, despite the fact that we're the fifth largest economy," said Nick Spall, of the British Interplanetary Society (BIS).

Spall, who has been spear-heading the BIS's 'UK astronaut' campaign, added: "I am encouraged that the possibility of Britain moving into human spaceflight is still on the agenda but disappointed that further detailed discussions mean a decision is effectively put off for another year."

"The Government is well aware that we can't just turn up with a cheque at the end of the next decade saying please can we join and have British astronauts go along - by then it will be too late," he added.

"By following the recommendations of the SEWG, the UK could establish a modest astronaut corps and access the ISS for 'precursor' science research flights today for a five percent increase in the UK space budget over five years. This would set things up nicely for an eventual UK contribution to the human exploration of the Moon and Mars."

Spall said he believed the Government is also in danger of missing "a huge trick" in terms of being able to offer the inspiration to young people that UK astronauts would bring to science and technology subjects.

"The chances of the UK contributing to a return to the Moon from a human spaceflight point of view are very limited now. If we don't have astronauts with spaceflight experience soon we won't get a look-in on the important missions of the future," he added.

Others were slightly more optimistic that the government might finally support a

The UK astronaut campaign logo.



Nick Spall, organiser of the BIS's UK astronaut campaign.

British astronaut once it had fully costed a programme.

"It feels as if it's going in the right direction. There's a realisation in the community that the next stage towards human spaceflight is to try and cost it out, so hopefully the review will achieve that," Ian Crawford, a space scientist at Birkbeck College, London, told *The Guardian* newspaper.

Crawford was on the BNSC panel that last year recommended a four-strong British astronaut corps be recruited from 2010 and fly two missions to the International Space Station to gain experience in space.

Though the composition of the new review panel has not yet been finalised, David Williams revealed that NASA astronaut Piers Sellers, veteran of two Space Shuttle missions in 2002 and 2006, has agreed to act as a consultant during the process.

Sellers was born in Sussex, England, and educated at Edinburgh and Leeds universities before moving to the United States to work for NASA as a research meteorologist. He began applying annually to become an astronaut in 1984 but his British citizenship was a problem so he became a naturalised US citizen in 1991.

Williams was unable to say whether any other NASA astronauts with British 'roots' would be joining Sellers on the panel.

Climate change

A cornerstone of the new strategy is Britain's continued role in future space technology and systems to tackle climate change.

The strategy calls for British-led technology to be at the forefront of new satellites that will help create an early

warning system for natural disasters, including hurricanes and tsunamis, and help to police international carbon-cutting agreements, such as pledges to avoid deforestation in some of the world's environmental hotspots.

Under the strategy Britain also declares its intention to host a major new European Space Agency (ESA) facility based at Harwell in Oxfordshire.

This will be dedicated to understanding climate change from space and developing robotics for space exploration. Currently, Britain is the only major contributor to ESA that does not have its own facility or specialist centre.

David Williams described Earth observation from space as a priority in order to help Britain "become a hub for expertise in environmental science and disaster relief". During the 1990s natural disasters killed half a million people and caused £380 billion of damage. Some 80 percent of those disasters were weather related.

"Global satellite-based monitoring systems underpin our understanding of the health of the planet, and alert us to dangers and speed up our responses," he added.

"Satellites have a significant role in accurately assessing changes in sea level and temperature, the melting ice caps, and the effects of solar activity on the Earth and its environment."

Specialised technology

As part of the new strategy, a national programme to develop specialised space technology will be set up, using grants, prizes and competitions to attract engineering companies.

Fruits of such a programme are expected to be miniature satellites that can fly in formation, advanced surveillance and imaging systems, and new means of propelling satellites in space.

Surveillance technology will be used to scan space for dangerous asteroids and debris from defunct spacecraft, and also to help forecast space weather, such as sudden bursts of radiation from the Sun which can wipe out satellites, and could be fatal for astronauts working on the Moon.

The strategy also promises to introduce regulations specifically to attract commercial space tourism, in view of such commercial flights becoming a substantial international market in the future.

ESA's Aurora

In the short term Britain will focus on its major role in the ESA's Aurora programme,



Stuart Martin, director of space and satcomms at LogicaCMG.

which aims to launch a robotic rover, Exomars, to the red planet around 2013. The mission will pave the way for a future attempt to bring samples back from Mars, and the long-term goal of landing astronauts on the planet.

Separately, Britain will also be looking to conduct space missions outside of the ESA by linking forces with Russia, the US and emerging space-faring nations such as China, Brazil and India.

Industry reactions

Stuart Martin, director of space and satcomms at LogicaCMG, said the strategy provided industry with "strong backing to achieve ambitious growth targets", as well as identifying a number of pillars upon which that growth can be based.

"It also rightly highlights the value of the current and growing contribution of the space industry to the UK economy, and the increasing importance of space-based technology to the delivery of government policy and the daily lives of all British citizens," he stated.

LogicaCMG's space division created 50 new high technology jobs during 2007, and Martin added that a strong UK space policy would enable them and other like-minded companies to continue this level of growth into the future.

"The role of space in monitoring and managing our changing environment comes through strongly, with a call for the UK to actively engage in defining the climate-based operational requirements for GMES (Global Monitoring for the Environment and Security)," added Martin.

"This point reflects the findings of a roundtable debate LogicaCMG held on the subject last November where we called for the UK to take a lead role in GMES; not just in terms of funding (where it currently lags well behind France, Germany and Italy), but in terms of helping ensure GMES remains objective and user-driven, and delivers on its potential."

UKspace, Intellect and the Society of British Aerospace Companies (SBAC) - the trade associations representing the UK space industry - broadly welcomed the Government's ambitious target of growing the UK's seven percent share of the high growth global space market by 2015.

UK space chairman, John Auburn, said: "The strategy recognises for the first time that the UK space industry is one of the highest value-adding sectors in Britain, employing one of the most highly-skilled workforces, and is six times more R&D intensive than the UK average.

"Satellites provide the tools to build a sustainable world, a safer planet, and a better quality of life. The UK space strategy provides the policy tools to keep the UK at the front of the new space race.

"The UK space industry is growing faster than China. But the global space industry is growing even faster. We will have to work hard to keep up with one of the world's most dynamic, value adding sectors. This is an ambitious aim and we welcome the challenge. But we will need to work in partnership with Government to realise this vision."

John Higgins, director of the technology trade association, Intellect said: "Three points of the space strategy stand out as having enormous market development potential - the introduction of a space-based solution in at least two new areas in the Government's policy agenda, the proposed new ESA facility in the UK and recognition of the importance of public procurement in encouraging private investment in the sector."

The 44 page 'UK Civil Space Strategy: 2008 - 2012 and beyond' (available to download from the BNSC website) is itself an eye-catching production in a rainbow of colours.

If it is pursued vigorously and with vision and ambition, then Britain's economy may well be able to rejoice in the expanding pot of 'space gold' at the end of the rainbow.

Send us your comments on the new UK space strategy - Spaceflight will publish readers' views in a forthcoming issue.