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**SPACE
EXPLORATION**

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**DEBATING MATTERS
TOPIC
GUIDES**

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MOTION:

**“MAN NOT MACHINES
SHOULD
EXPLORE SPACE”**

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INTRODUCTION

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The successful landing of the Phoenix Mars Lander – the first space shuttle to land on Mars – the 50th anniversary of NASA, and China’s planned launch of a third manned shuttle have made 2008 a significant year for space exploration. But this year has also seen its fair share of drawbacks. The 2010 retirement of NASA’s present fleet of spacecraft, and the delay of the Orion shuttle replacement until 2014, leaves NASA in limbo. Debate between presidential candidates about the future of space exploration has also created uncertainty about what changes a new administration will bring to President Bush’s ‘New vision for space exploration’. In the UK, the publication of the Civil Space Strategy 2008-2012 and Beyond signalled the government’s reversal of the decision not to launch manned space missions made in the 1980s, but has attracted criticism and dissent. Space exploration thus stands at a crossroads. At the centre of this debate is the question of whether space exploration should involve humans or machines. The decisions made in the next few years will affect space policy for generations to come.

KEY TERMS

- Hubble Space Telescope
- International Space Station
- NASA



What factors have driven space exploration?

Exploration and discovery have been essential to the progress of human civilization, and are at the centre of the American ideal and its frontier spirit. However, the immediate context of the 1969 Apollo 11 mission was a space race against the Soviet Union in which sending a man to the Moon was a way of asserting national superiority in the Cold War. Although some have identified a new space race between China and the US, today the geopolitical context is very different and a new rationale is needed. Whilst surveys have found a core of public support for space exploration in some form, there is also widespread agreement that the space programme has recently suffered from a lack of direction. In the future, should we pursue ambitious and inspirational manned missions or concentrate on more realistic and scientifically focussed unmanned missions?

Are manned missions inefficient and excessively risky?

The higher safety standards required for manned flight, together with the resources like water, air and food that need to be provided, mean that a shuttle mission can be 25 times more expensive than sending a satellite into orbit. Unmanned landers have touched down on Mars for \$250 million. Estimates of what a manned mission to Mars could cost range from \$30 to \$500 billion. There would also be many more challenges to overcome than in a normal shuttle flight, ranging from the time involved – around three years – to radiation from solar storms and possible collisions with space debris. Given the problems experienced by recent shuttle flights, the argument goes, what is the likelihood of a successful mission to the Red Planet?

Are manned missions a scientific priority?

Pursuing human space exploration diverts resources away from other non-space related scientific fields that some argue are more deserving - although manned space flight has led to a number of spin-off technologies. Within the space exploration community, some argue that most scientific progress comes from unmanned missions that focus on the most compelling and answerable scientific questions. If one thinks of the most exciting recent developments in space science – the Hubble Space Telescope, the comet probe Deep Impact, the Cassini-Huygens mission to Saturn – they are all unmanned projects. In early 2006 scientists were excited by the return of the Stardust capsule with samples of cometary dust, and the New Horizons mission saw a probe launched to Pluto. By contrast, the launch of the space shuttle suffered further delays.

Why send humans to Mars?

For advocates of human space exploration the debate goes beyond science, and the issue of whether robots could replace humans in performing scientific experiments, and involves what the scientific impulse says about humanity. A Mars mission would be a statement of the value of human civilization, something that is valuable in itself rather than for the scientific discoveries that it produces. It represents the sort of challenge that a society requires in order to advance and is part of humanity's progress towards becoming a multi-planet spacefaring species. Some see the fact we have failed to continue pushing forward the boundaries of human space exploration as a sign that we have given up on reaching for the stars.



One giant leap backwards for mankind?

Is manned space flight and the desire to 'boldly go' into the unknown a heroic symbol of human aspiration in a world that has become obsessively concerned with eliminating all possible risks? Or is it rather the case that these ideas are outdated, that we should look for romance elsewhere and that seeking to recapture the spirit of exploration would interfere with scientific priorities? Does manned space flight still inspire the public, or, by continuing to pursue it despite the dangers, do we risk discrediting the entire space programme?



ESSENTIAL READING

Debating Manned Moon Missions

Kenneth R Fletcher *Smithsonian Magazine* July 2008

The race for space

Nick Dusic *The Journal* 26 February 2008

Big Question: Is manned space travel a waste of time and money?

Rupert Cornwell *Independent* 6 July 2006

Seeking a rationale for human space exploration

Jeff Foust *The Space Review* 9 February 2004

FOR

British space policy on life, the universe and everything

Michael Huang *Space Review* 17 March 2008

Is space exploration worth the cost?

David Livingston *Space Review* 21 January 2008

Space exploration does not come cheap

Editorial New Scientist 8 September 2007

Retreating from the final frontier

Henry Joy McCracken *spiked* 3 August 2005

The human explorer

Robert Zubrin *The New Atlantis* 5 February 2004

AGAINST

A waste of space

Robin McKie *New Statesman* 3 April 2008

Let's forget Nasa's fancy ideas

Martin Rees *The Times* 14 February 2008

An interview with Steven Weinberg

Sam Dinkin *Space Review* 14 January 2008

Nasa and its small, sideways step for mankind

Tim Hames *The Times* 8 August 2005

The Virtual Astronaut

Robert Park *The New Atlantis* 5 February 2004

IN DEPTH

Advancing the frontiers of space exploration

Obama '08 17 August 2008

UK Civil space strategy 2008-2012 and beyond

British National Space Centre 12 February 2008

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BACKGROUNDEERS

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Making space vision a reality

Pallab Ghosh *BBC News* 19 January 2006

Q&A: Nasa's new Moon plans

BBC News 20 December 2005

Analysis: Europe's roadmap for space

Helen Briggs *BBC News* 7 December 2005

Why we explore

Stephen J Dick *NASA* 14 October 2004

The vision for space exploration

NASA February 2004

Remembering the human cost of exploring space

CNN Crossfire Transcript 4 February 2003

Stardust

New horizons

Mars Reconnaissance Orbiter

Galileo

Deep Impact

Cassini-Huygens

Phoenix Mars Lander

Orion

Shenzhou

Space Shuttle Columbia

Discovery mission

Apollo 11 mission

SPACE.com

Space exploration special report

Guardian

Exploring Mars

BBC News In Depth

Space exploration

BBC News

ORGANISATIONS

The Mars Society



IN THE NEWS

India has big plans for Lunar Exploration

Universe Today 17 August 2008

Water found on Mars, Nasa scientists confirm

Daily Telegraph 31 July 2008

Nasa will struggle when shuttle retires says boss

Guardian 26 July 2008

Scientists plan to bring back rocks – and perhaps even life – from Mars

Guardian 14 July 2008

China manned space flight set for October: state media

Space Daily 12 June 2008

The search for astronauts is on

Guardian 19 May 2008

Europe's first crewed spaceship on the horizon

New Scientist 15 May 2008

Close encounter: Nasa plans landing on 40 m-wide asteroid travelling at 28,000 mph

Guardian 7 May 2008

Steven Hawking calls for Moon and Mars colonies

New Scientist 21 April 2008

Astronomers see stars

Guardian 4 March 2008

NASA urged to focus on sending people to Mars

New Scientist 15 February 2008

Ministers consider UK astronauts

BBC News 14 February 2008

Virgin unveils spaceship designs

BBC News 24 January 2008

UK 'must have human space role'

BBC News 14 September 2007

UK 'should have own astronauts'

BBC News 21 April 2006

Human spaceflight goes commercial

BBC News 21 March 2006

Nasa delays space shuttle launch

BBC News 14 March 2006

Mars orbiter reaches Red Planet

BBC News 11 March 2006

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- I am a sixth form student and would like further details about events in my area
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- I am interested in sponsoring/supporting Debating Matters
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Surname

School/company/
organisation

Professional role
(if applicable)

Address

Postcode

Email address

School/work phone

Mobile phone

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TEACHES A WAY
OF THINKING.
INTELLECTUAL
ARCHITECTURE
IS CREATED BY
ENGAGING WITH
IDEAS”**

TRISTRAM HUNT, HISTORIAN & BROADCASTER

