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The Global Exploration Strategy and Why it Matters

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Abstract

In 2007, 14 of the world's space agencies agreed on a 'Global Exploration Strategy' for the human and robotic exploration of the inner Solar System. This strategy identified many excellent reasons for international space cooperation, and led to the founding of the International Space Exploration Coordination Group (ISECG) and, in 2011, the Global Exploration Roadmap. However, these developments are not as well known as they deserve to be, and the aim of this paper is to bring them to the attention of a wider audience. I will also explore how the Global Exploration Strategy may eventually lead to a genuinely global space programme.

1. Introduction

In 2007, 14 of the world's space agencies agreed on a 'Global Exploration Strategy' for the human and robotic exploration of the inner Solar System. The foundational document [1] identified many excellent reasons for international space cooperation, and led to the founding of the International Space Exploration Coordination Group (ISECG) [2] and, in 2011, the Global Exploration Roadmap for the international human and robotic exploration of the inner Solar System [3]. Beginning with the International Space Station (ISS), the Global Exploration Roadmap reflects the international effort to define feasible and sustainable exploration pathways to the Moon, near-Earth asteroids, and Mars over the next 25 years. Many diverse areas of science would benefit from implementation of the Global Exploration Roadmap, including planetary science, astrobiology, and aspects of space astronomy. In addition, significant economic and societal benefits might also be expected from the implementation of the Roadmap, not least those arising from increased industrial innovation, inspiration of young people to take a greater interest in science and engineering, and enhanced opportunities for international cooperation.

2. Science enabled by the Roadmap

Implementing the Global Exploration Roadmap will result in the following scientific benefits [1,4,5,6]:

- The exploration of the lunar geological record to elucidate conditions on the early Earth;
- The detailed study of Near Earth Objects for clues relating to the formation of the Solar System;
- The search for evidence of past and/or present life on Mars (and especially deep sub-surface life);
- The provision of a heavy-lift launch capability which will facilitate the robotic exploration of the outer Solar System (e.g. possible sample return missions to Titan and Europa); and
- The construction and maintenance of sophisticated space-based astronomical tools for the study of the wider universe.

3. Societal Benefits

In addition to these scientific benefits, a number of significant societal benefits may also be expected to arise from implementation of an ambitious global space exploration programme such as envisaged by the Global Exploration Roadmap, including [1,7]:

- Stimulation of technical innovation and employment in key industries;
- Expansion of Earth's economic sphere out into the Solar System to include the utilization of extraterrestrial energy and raw materials;
- The inspiration of young people to take a greater interest in science and engineering; and
- The provision of a challenging, shared, and peaceful activity that unites nations in pursuit of common objectives.

4. Towards A Global Space Programme

As the preamble to the Global Exploration Roadmap itself says [3]:

"*Human and robotic exploration of the Moon, asteroids, and Mars will strengthen and enrich humanity's future, bringing nations together in a common cause, revealing new knowledge, inspiring people and stimulating technical and commercial innovation*"

The whole emphasis is on a *global* endeavour conducted on behalf of humanity as a whole. The development of the Global Exploration Strategy may therefore be seen as laying the foundations of a genuinely global space programme. Indeed, the cosmic perspective engendered by space exploration carries with it the subliminal message that these activities *ought* to be conducted as a global enterprise (Fig. 1). Ultimately, the Global Exploration Strategy matters because Planet Earth needs and deserves a unified space programme.

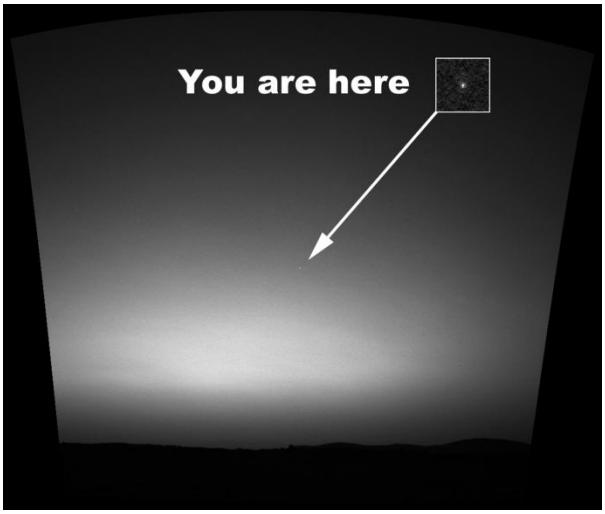

Fig. 1. The Earth photographed from the surface of Mars by the Mars Exploration Rover *Spirit* in March 2004. Given this perspective, the very idea of humanity exploring space on a nationalistic basis appears absurd (image courtesy of NASA).

5. Summary and Conclusions

The Global Exploration Strategy, and the Global Exploration Roadmap developed from it, may be expected to yield significant scientific and societal benefits. Indeed they may be seen as laying the foundations for a genuinely global space exploration programme from which all humanity will benefit. It is therefore in everyone's interests that these efforts should succeed, and policy makers should redouble their efforts to ensure that they do so.

References

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