

SPACE HERITAGE AT RISK

Humanity has journeyed beyond its home planet and sent robotic explorers beyond the Solar System, all within living memory. A legacy of artefacts orbit the Earth, are present throughout the Solar System and beyond, and sites of exploration and science now exist on other celestial bodies. This Heritage at Risk report considers these artefacts and sites.

Natural risks

Above Earth's atmosphere is a harsh environment in which humans and their related technologies are exposed to extreme heat, radiation, and the risk of impact. Artefacts in Space or situated on celestial bodies may be at risk of cumulative or severe damage, or destruction. Given the lead time necessary to make decisions and implement a course of action (e.g. relocation of heritage artefacts

from a site that will be impacted by an asteroid or comet), there is a risk that insufficient time would be available to plan, prepare and implement a response.

Recommendation

Planning for potentially damaging or destructive events to Space heritage artefacts/sites is undertaken in advance with ongoing reviews of the response plans.

Human risks

Lunar sites: Apollo missions by the United States of America resulted in the first, and to date only, human exploration and scientific research on the Moon. Several nations have undertaken robotic exploration and science on the Moon with the



International Space Station. Astronauts Christer Fugleman, Sweden and Robert L. Curbeam, USA (image courtesy of NASA)

former USSR¹ and China² landing rovers on the surface, Japan deploying satellites, the European Space Agency deploying a Swedish satellite,³ and India⁴ and Israel⁵ launching Lunar missions.

In recent years, technological advances by Blue Origin, SpaceX and others have been enhancing access to Space through the utilisation of innovative reusable technology. The accumulation of great wealth by individuals with interests in Space heritage has resulted in the potential for non-government actors to visit and engage with Lunar heritage artefacts and sites. The retrieval, on Earth, by Jeff Bezos of an Apollo 11, stage one F1 engine from the seabed demonstrated this interest and capability – also raising the issue of the interrelationship between Space and maritime heritage.⁶

The current primary areas of interest are the Apollo mission sites, and it is conceivable that robotic missions, followed in the future by humans, will visit the Apollo sites on the Moon. In response to this possibility, due in particular to the Google Lunar X-Prize, the United States of America's National Aeronautical and Space Administration (NASA) developed guidelines for non-government entities who intend to visit an Apollo site.⁷ The following was noted: some experiments on the sites are still active, the artefacts were of interest to scientists and engineers, and there is no legal mechanism to prevent disruption of the site. In response, Google agreed that all Lunar X-Prize competitors would abide by the NASA guidelines.

The International Space Station (ISS) is a work of human genius. Many nations have worked together to establish the first multi-national base for humanity in Space. In the near future, the fate of the ISS must be decided. Can it remain in use or will its operational life be concluded? When the decision is made to decommission the ISS, two choices arise: de-orbit and burn-up in the atmosphere or relocation to high-orbit.

Recommendations

ICOMOS encourage and assist with the development of agreements that ensure that Space heritage sites of all nations are treated with respect, and managed in accordance with the highest standards in heritage conservation.

The retention of the ISS in orbit as a Space heritage structure for future generations would be a worthy endeavour to commemorate all that the ISS programme will have achieved, and inspire future generations about the value of cooperation in Space exploration and science.

Recommendation

When the International Space Station is decommissioned, it is raised to, and retained in, high-orbit.

Space Heritage and ICOMOS

ICOMOS has a distinguished history of international scientific committees (ISCs) that inform ICOMOS, international organisations, governments and heritage professionals of the latest research and developments. The ICOMOS International Polar Heritage Committee is a successful example of an ICOMOS ISC that engages with heritage in extreme environments and, in the case of Antarctica, beyond the boundaries of nation-states. Given the role of ICOMOS as the leading international organisation in these matters, and expertise that already exists among members of ICOMOS, it is timely that ICOMOS formally engages with Space heritage.

Recommendation

ICOMOS considers establishing an ICOMOS International Space Heritage Committee.

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Footnotes

¹ <https://nssdc.gsfc.nasa.gov/planetary/lunar/lunarussr.html>

² <https://phys.org/news/2019-07-china-mysteries-moon.html>

³ <https://sci.esa.int/web/smart-1/-/47714-esa-shares-smart-1-leg-acy-with-the-world>

⁴ <https://www.isro.gov.in/launcher/gslv-mk-iii-m1-chandrayaan-2-mission>

⁵ <https://www.nytimes.com/2019/04/11/science/israel-moon-landing-beresheet.html>

⁶ <https://www.bezosexpeditions.com/updates.html>

⁷ https://www.nasa.gov/pdf/617743main_NASA-USG_LUNAR_HISTORIC_SITES_RevA-508.pdf