

Mars Sample Return Outreach — Planning a Meaningful and Participatory Public Engagement Programme

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Introduction

Mars Sample Return (MSR) offers planetary science the prospect of an historical leap forward in the understanding of the geology and habitability of the red planet. In addition to this important science return, MSR also offers an unprecedented opportunity to engage the citizenry of this planet in one of the enduring questions of humanity, “Are we alone?”

The 2018 report of the International Mars Sample Return Objectives and Samples Team (iMOST) study says, “Exploration of Mars to date, from orbit and from the surface, has given us incredibly valuable insights into many aspects of Mars. These insights have allowed us to pose new, far more detailed, questions that could not have been asked before. A certain set of scientific objectives can only be achieved with samples in a laboratory. For Mars, we are at the point where the scientific logic implies this should be done next. Results are expected to be profound (“civilization-scale” science).”¹

2nd International Mars Sample Return Conference

The 2nd International Mars Sample Return Conference² took place from 25-27 April 2018 in Berlin, Germany. The conference aimed to establish a better understanding of the options for a possible International Mars Sample Return campaign in the next decade, given the 2018 context, to highlight recent accomplishments in Mars exploration that feed forward to Mars Sample Return, and to share international agency and private industry preparatory plans for future Mars missions relating to Mars Sample Return.

¹Report of the iMOST Study, 9 May 2018

²<https://atpi.eventsair.com/QuickEventWebsitePortal/2nd-international-conference-on-mars-sample-return/home>

Around 200 participants attended the conference, including representatives of space agencies, the international science community, industry and outreach providers, to discuss scientific objectives of an MSR mission, engineering design stages, planetary protection issues, curation and analytical facilities, and outreach strategy.

At the ILA Berlin air show, which took place in parallel to the meeting, Dr Thomas Zurbuchen, NASA’s Associate Administrator for Science, and Dave Parker, Director of Human and Robotic Exploration at ESA, signed a Statement of Intent to explore concepts for missions to bring samples from Mars to Earth.³

At the end of the meeting, opportunities and motivations for carrying out MSR on an international basis were identified in the following four categories: Science:

- *Civilization-scale science*
- *Samples: the gift that keeps on giving*
- *Definitive scientific results*
- *Only way to advance critical sectors of planetary science & astrobiology*

Engineering:

- *Unique technical challenges drive unprecedented innovation*
- *Advances will benefit future robotic and human missions.*
- *Crucible for engineering as a discipline.*

Preparation:

- *Prepare for humans to Mars*
- *Inform planetary protection policy evolution to enable future missions*

Inspiration:

- *Inspire and train the next generation*
- *Magnet for international cooperation*

Conference Position Statement:

The scientific exploration of Mars and the search for extra-terrestrial life have advanced to the point that

³ [https://mepag.jpl.nasa.gov/announcements/2018-04-26 NASA-ESA SOI \(Signed\).pdf](https://mepag.jpl.nasa.gov/announcements/2018-04-26 NASA-ESA SOI (Signed).pdf)

the return of samples from Mars is more important than ever to enable the next big discoveries in Mars exploration. Capitalising on major engineering progress in recent years by the world's space agencies and industries, we are technically ready to start the development of the flight missions associated with retrieving the samples. In parallel, planning for the potential receipt and evaluation of the samples has started, and should accelerate, as well as for the processes associated with making the samples available to the world's science community. Given the nature and scope of the Mars Sample Return campaign, we expect that engaging the public early and keeping them involved throughout will be a particularly important component of this effort. We have the opportunity and the motivation to make the Mars Sample Return campaign an international endeavour and a reality for all humankind.

Recommendations for developing an outreach strategy for MSR

During the outreach session at the 2nd International MSR Conference, the following recommendations for MSR public engagement strategies were presented and discussed^{4,5}:

- Begin formulation of key MSR elements that will be of public interest and assess any related existing opinions, misconceptions (risk communication), and needs that could be relevant to our planning and communication;
- Beginning *now*, in getting ready for the upcoming Mars 2020 rover mission, prepare a long-term plan for MSR education and public outreach strategies that will be inclusive of multiple audiences and will leverage available technologies;
- Prepare a timeline and depository that will include major mission milestones, related scientific activities (e.g., curation preparation, analogue field trips, discoveries, spinoffs), and MSR outreach events;

- Identify participatory programmes where citizens and students can contribute actively towards mission science goals;
- Identify synergistic groups that we can engage to expand our reach;
- Identify evaluative program mechanisms to assess impact;
- Involve the international MSR team as our “faces of exploration” and expert advisors as we take on this amazing challenge.

MSR will involve a set of complex steps that will occur over a long timeframe and will necessitate the development of outreach strategies that will enable the public to fully engage, dialogue, and meaningfully participate with the science community during this endeavour. The discussions in Berlin were an important first step, but it will be important to consult and involve the international planetary outreach community if this is to become an effective global programme.

Continuing and expanding discussions

This presentation at EPSC aims to continue and broaden the discussion on MSR outreach strategy to include the wider planetary science and outreach communities in Europe and beyond.* The authors would welcome any thoughts, comments or suggestion.

*If the session conveners are able to allocate any additional time for discussion, it would be much appreciated.

⁴ Klug Boonstra presentation, 2nd MSR Conference: https://drive.google.com/file/d/1DF6kLm3NhOQfNc_tuSnyzSq47dY6LRRZ0/view

⁵ Heward presentation, 2nd MSR Conference: <https://drive.google.com/open?id=1qCCDuxiGnAIn1ydbLdrPf8IGmd6HAnFF>