EPN 2024 RI

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Project Co-ordinator: Prof Nigel Mason, University of Kent

Executive Summary / Abstract:

We have developed a dynamic, interactive Virtual Exhibit on Mars Sample Return, using augmented reality to bring the Natural History Museum martian meteorite collection and the surface of Mars to life.

http://frommars2earth.org

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1. Approach

Virtual Exhibit link: frommars2earth.org.

The virtual exhibition was developed by scientists (Peter Grindrod and Sara Russell) at the Natural History Museum, using their extensive martian meteorite collections. A postdoctoral researcher (Aimee Smith) was hired to (1) devise a photogrammetry method and setup for capturing 3D data, (2) make 3D models of a range of meteorites (7 martian, 3 iron, 2 lunar, 3 other) from the NHM collection, (3) researched all content, including interviews with external experts, (4) developed the exhibit structure, (5) drafted the exhibit text and sourced images and other 3D models. An external developer designed the exhibit website, implemented the backend 3D software required for the 3D models, and provided the overall website. A second developer made small changes to the design, content, and structure of the website. The team at the University of Kent (Anita Heward and Callum Piper) and DFET (Victoria Southgate and Seda Ozdemir Fritz) reviewed and edited the text to make it suitable for a public audience.

The design of the exhibit is optimised for mobile phones and tablets, where augmented reality can be used to maximum effect, but is also designed to be an interactive experience on laptops. The exhibit website allows users to interact with a number of elements on the website, and, through augmented reality, to place 3D models of into their own physical space, providing a new insight into these objects (e.g. meteorites, Mars rover, Mars helicopter). The interactive elements are provided on a front page, which is optimised for fast loading, and can be explored in isolation. But each interactive element provides a link to more detailed information, provided by a second website layer through a content management system that can accommodate future changes. An underlying theme is an emphasis on how Mars Sample Return relies on a diverse team of scientists and engineers, and on extensive international cooperation.

The information is aimed at the interested public, including adults and teenagers, and is multi-layered, to include links to that links to more detailed information at a level that would be of interest to undergraduate and graduate students working in planetary sciences and related fields.

The landing page from which the ‘virtual galleries’ are accessed includes 3D models that can be explored through AR and/or on screen. The main sections include:

- The Red Planet
- Martian Meteorites
- Mars Sample Return Campaign
- Exploring Mars and Jezero Crater
- About the Samples
- Showcase Research

Given the recent uncertainly surrounding the NASA contribution to the NASA-ESA Mars Sample Return, we have designed the exhibition to be about Mars samples on Earth, both

meteorites and samples that will be returned by the NASA/ESA Mars Sample Return campaign.

2. Outputs

The virtual exhibition has undergone a ‘soft launch’ in July 2024 while feedback is gathered from the wider community and branding is finalised. A public launch will take place in September 2024 alongside Europlanet Science Conference (EPSC).

As well as the website itself, a poster about the virtual exhibition will be presented at EPSC on 13 September 2024.

3. Sustainability

The aim of the exhibit is to be a long-term resource for the community exhibit, that can be added to and updated as the Mars Sample Return programme evolves. To allow for this, the interactive front page has been designed to be fixed changing, whereas the detailed content is hosted in a commonly-used content management system that allows freedom for content editing and creating as necessary.