

Planetary Science Communication through Public Events

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Abstract

The team of Planetary Sciences and Remote Sensing at Freie Universität Berlin (www.fu-berlin.de/planets) is involved in international space missions such as *Mars Express*, *Cassini* at Saturn, and *Dawn* at Vesta and Ceres. Science communication through educational and public outreach activities is a basic component of our research. In particular, we take part in several outreach events over the year and we provide image data and models to exhibitors.

1. Workshop concepts for pupils

The *Girls' Day* is a national future career day in Germany that takes place annually at the end of April. It is especially aimed to promote training and studies of IT, handcraft, natural sciences and technology, disciplines in which women are typically underrepresented. Since 2011 we are engaged with planetary science workshops in the *Girls' Day*. Up to now, five hands-on workshops have been designed which target mainly pupils aged 10-12. The topics cover the structure of the solar system (Fig. 1), geologic processes on planets, and digital as well as three-dimensional images. All workshops begin with a general introduction that provides overview and background information to the subject.



Figure 1: Pupils taking part in a workshop about distances and rotations in the solar system.

The introduction is followed by practical work such as drawing, creating models, and performing measurements or experiments (Fig. 2). This part is realized in small groups of 2-4 girls. To support understanding and for documentation reasons special worksheets have been designed that have to be filled in by the pupils during the course of the workshop. In the last part, the results are presented by each group to all participants, to foster interactive collaboration and exchange among the kids.

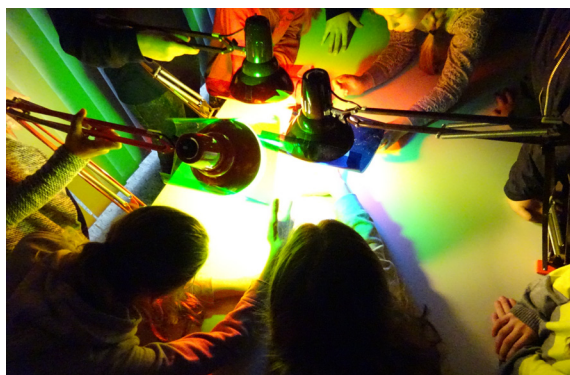


Figure 2: Pupils performing light experiments with Red/Green/Blue colors.

To follow up each workshop with their teachers in class, the participants receive some additional take-home material what we have prepared beforehand (handouts, flyers, booklets, red-blue anaglyph glasses and images). Finally, we evaluated the workshops with questionnaires: Most of the participants gave our workshops a credit of “very good”, in particular the girls enjoyed working in small groups and filling in the worksheets.

2. Long Night of the Sciences

Yearly at the beginning of June the science event *Long Night of the Sciences* (Lange Nacht der Wissenschaften) takes place in Berlin at the Freie Universität and many other universities and research centers. From 5 pm to midnight, laboratories and lecture rooms are open to the public. Young and old are likewise invited to see where and how research is

being done. The departments of the Freie Universität Berlin present themselves with their projects and involvements, give presentations, and answer questions. The Planetary Sciences and Remote Sensing Team has been taking part in this event since 2006. Last year a modern 3D beamer with shutter-glasses for cinema-mode projection of our Mars movies was purchased. More than 500 visitors saw the 3D animated flights over the surface of Mars. In addition, we provided a large Mars landscape panorama as background for smartphone-pictures. For kids we also made astronaut costumes and helmets available (Fig. 3).



Figure 3: Kids become “astronauts on Mars”.

3. Participation in exhibitions

With various planetary anaglyph images, which generate a 3D impression of the landscape when viewed using red-green or red-blue glasses, we have compiled a mobile exhibition for display at, e.g., observatories, planetariums, or institutions (Fig. 4).



Figure 4: Anaglyph exhibition.

In 2014 we prepared high resolution space imagery for the exhibition *Mars Attacks* of the Kunstverein Salzgitter, in which artist Sven Reile presented oil

paintings of the Earth moon, the Martian moon Phobos, and asteroids. In addition, a 1:1 model of the High Resolution Stereo Camera (HRSC) onboard the ESA mission Mars Express was provided (Fig. 5).



Figure 5: Model of the HRSC on loan for the arts exhibition *Mars Attacks* in Salzgitter.

In 2018 the *Mars Express* mission teams are celebrating 15 years successful launch of the orbiter. On this special occasion we are planning an exhibition of Mars images together with the Planetarium Hamburg.

4. Motivation for public outreach

With public events in planetary sciences we fulfill multiple tasks: to enable open access to planetary mission data, to communicate science results, to present possible fields of study to pupils and students, and to create a public confidence in science to justify public funding in the end. We want to become aware of the public perspective of planetary sciences by establishing a dialogue with citizens, to help improve accessibility to and understanding of the outcome of planetary missions.

Acknowledgements

Image credit: Planetary Sciences (Figs. 1, 2, and 4), Bernd Wannemacher (Fig. 3), Dr. Klaus Berner (Fig. 5). This work was supported by the DLR Space Administration on behalf of the Federal Ministry for Economic Affairs and Energy, grants 50OH1503 (*Cassini*), 50OW1505 (*Dawn*), and 50QM1702 (*HRSC on MarsExpress*). We want to thank our former team members that were involved in the accomplishment of the science events.