EuroPlaNet Outreach Sessions Through a Lens:
Engaging Planetary Scientists in the Communication of Science

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Key Words

Conferences
Science Communication
EPO Sessions

Summary

Although European scientists are active in space sciences and technology, comparatively little effort is being put into communicating space achievements to the public. While the American National Aeronautics and Space Administration (NASA) is well known in Europe, its counterpart, the European Space Agency (ESA), is poorly recognised. The need to seek strategies that will help forge relationships between the research community and European citizens has been recognised by numerous bodies, and initiatives to move public engagement further are, for many, now part of their activities. EuroPlaNet, the European Planetology Network, is an example. Among other activities, EuroPlaNet organises an annual scientific meeting, the European Planetary Science Congress (ESPC), which covers a wide range of planetary and space science topics, and also incorporates outreach sessions where professionals of science communication can discuss and share best practices. This paper will explore the contribution of outreach sessions to strengthening the relationship between science and society. We present here an overview of the sessions during the period 2006–2008, and discuss our views on the value of outreach sessions at scientific conferences.

Introduction

Space technology and activities have an increasing and important value in our lives. One might expect to see a public that is generally well informed and supportive. Studies aimed at understanding the public's general knowledge and attitudes to space activities show that there is a general awareness of space science and technology. But European citizens, specially the young, have little knowledge about space issues, and more precisely of European space programmes and achievements (Ottavianelli, 2002; Jones, 2007). Harriet Jones (2007) showed that, when asked to list space exploration organisations, less than 0.5% of the British 13–15 year old students involved in the study listed ESA. This is despite the strong participation of the UK in the Mars Express mission and the publicity given to its (albeit failed) Beagle 2 lander, as well as the Cassini mission to Saturn and its (highly successful) Huygens probe, to give just two recent, high profile examples. (See Jergovic and Miller, 2008, for a review of the UK press coverage of these missions.)

Although the level of detailed knowledge is lower than might be expected, given the extensive press coverage, "astronomy and space" is one of the areas that attracts a great deal of public interest. Indeed, when comparing the Eurobarometer survey results from 2001 and 2005, the most significant rise in interest by the public can be observed for "astronomy and space", which has increased from 17% to 23% of Europeans saying that this is an area that interests them.

One of the main reasons identified for the poor awareness of space matters is the lack of good communication by those directly involved in science. For example, in 2007, *the Space Policy Journal* stated that "Space agencies and public outreach — must try harder" (Brown, 2007). The same issue discussed a series of recommendations for an "active strategic communications effort" by space actors to engage the public more and then enhance support for space exploration (Finarelli and Pryke, 2007). Furthermore, the tendency in Europe is for planetary and space scientists and engineers to talk only with their peers and not to get their message across to the public. It seems that Americans are far more efficient in communicating space sciences than their European counterparts (Lorenzen, 2007). Even though the promotion of the public understanding of science

is now recognised in Europe as part of a scientist's professional duty, and national governments and several governmental agencies are involved in it (Royal Society, 1985; Gregory and Miller, 1998; European Commission, 2001; European Commission, 2007) it seems that communication does not come immediately to the minds of European scientists. It is worth saying that Europeans believe scientists put too little effort into informing the public about their work; however, they are still regarded as the best qualified to explain science to society (Eurobarometer, 2005).

One indicator of these differences in the attitudes towards public communication between the US and Europe is the enormous discrepancy between the number of images of the European Mars Express mission and the American Phoenix mission made available on the dedicated websites for each of the missions. After almost five years of operation, a mere 549 of ESA's Mars Express images are online, against the 35 560 images that the Phoenix mission released to the public in the five months of operation of its lander[1]. According to the opinions of European museums and planetarium operators polled by ASTRONET's Infrastructure Roadmap (Bode 2008), images and videos relating to astronomy and space are needed, and a "central repository of visual material" would be of special interest to them. The importance of producing interesting and high quality communication products is recognised by ASTRONET as one of the best ways to improve the communication–cultural differences between the US and Europe.

Detailed reports have called for the development of sustained programmes of public engagement with space science. In May 2007, the Global Exploration Strategy (Framework for Coordination, 2007), a vision for robotic and human space exploration, agreed that space exploration is a "global partnership in service of society", and that a programme to engage the public and encourage students is vital. National governments have also shown interest by publishing their own civil space strategies. For example the UK Civil Space Strategy Report (2008) states that "improving public understanding of science is a top-level government objective".

As an answer to this demand, many individual and governmental bodies have been designing schemes to encourage scientists to communicate more with the public. An example is the strategy employed in Britain by the Research Councils, particularly the Science and Technology Facilities Council (STFC), which is responsible for such scientific areas as space and astronomy, in supporting their research grant holders in their public engagement work (grant awards schemes, support for communication skills training courses, delegation of scientists as schools liaison officers, and involvement of PhD students with schools and the public). By many measures, it is worth noting that this strategy has generated a notable increase in both the number of scientists communicating and the number of activities in the recent past (Pearson, 2001). Another example is the programme of training courses on science communication skills already adopted by numerous countries such as Portugal, the UK and Australia. This is also found at a broader level. The European Commission (EC) has been very supportive of public engagement. A case in point is the ESConet Trainers project, which organises workshops in science communication for EC-funded scientists[2]. Indeed, the EC made has made outreach a *sine qua non* for funding and science communication is now an essential ingredient in any EC-funded project. EuroPlaNet[3] is an example. It was created in 2005, with the aim of supporting and gathering planetary scientists together; but it also integrates initiatives to improve the public understanding of planetary environments.

EuroPlaNet

One of the widely perceived failings of the planetary sciences in Europe is that the community is very fragmented, divided along national boundaries, and tending to look towards the United States for partners. This is despite the existence of the European Space Agency, which is becoming increasingly important as a focus for space missions and European team-building. The European Commission funded project, EuroPlaNet, set out to build an organisation that could achieve the long-term integration of planetary sciences across Europe. In its second year (2006) EuroPlaNet inaugurated an annual European Planetary Science Congress (EPSC). EPSC is a vital "dissemination platform", aimed not just at planetary scientists in Europe and elsewhere in the world, but at the "users" — industry, politicians and the public at large.

EuroPlaNet also undertook to develop engagement between European space and planetary scientists and the public at large. The network sponsored the production of several outreach products, products that can be found on the EuroPlaNet website[4]. EuroPlaNet's outreach team decided that there should also be outreach sessions dedicated to public engagement activities at the EPSC. Although this is not a new approach, the incorporation of outreach sessions in scientific congresses can be seen as part of a process of "redesigning" scientific meetings over time.

Outreach sessions at scientific meetings

The "redesign" of scientific meetings has been very effective in strengthening relations between science and society. It has often picked up on ideas that go back to the early days of the 19th century, when science was starting to come into its own. For example, right from its foundation in 1831, the British Association for the Advancement of Science (BAAS) combined scientific sessions with lectures aimed at the general public, which were given by notable scientists of the day such as Michael Faraday, John Tyndall and Thomas Henry Huxley.

The American Association for the Advancement of Science (AAAS), now the world's largest scientific society, is renowned for its annual meetings, attended by more than 10 000 participants every year. When it was founded in 1848, the idea behind the AAAS annual meeting was similar to that of the BAAS. Somewhere along the way, the "public" side of the meeting was lost: in 1951, the AAAS Board criticised it as being too scientific and "old-fashioned" and recommended that the Association focus renewed attention on the relations between the public and science (Arden House, 1951). In 1955, Warren Weaver, the then president of the AAAS, pushed the meetings to take on a new role in reaching out the public, and since then the meetings have been a major event for the host city, strongly focused on the general public.

The example of the BAAS and AAAS annual meetings has, belatedly, been adopted by Europe. In 2004, ESOF, the EuroScience Open Forum, held its first biennial meeting. Like the BAAS and AAAS, ESOF has a very broad scientific programme, with many public events (Enserink, 2004). The meeting has been successful, with an increase in the number of sessions and participants, both scientists and non-scientists, since it started: 1300 participants in 2004 in Stockholm, and some 4500 in Barcelona in 2008 (Enserink, 2008). The scheme has been adopted by others and public events are now common at broader scientific congresses. This can merely be an evening event for the local community scheduled outside of the main congress programme.

Incorporating outreach sessions into more narrowly focused scientific meetings provides places where science communication professionals associated with the scientific discipline in question can meet for

discussions and share best practices. This is happening more and more at meetings that discuss issues of high public interest, such as the environment. And astronomy and space sciences have also taken a lead and held outreach sessions at major meetings. Examples are the American Astronomical Society (AAS) meeting, the Astronomical Society of the Pacific (ASP) meeting, the International Astronomical Union General Assemblies (IAU GAs) and the International Astronomical Congress (IAC).

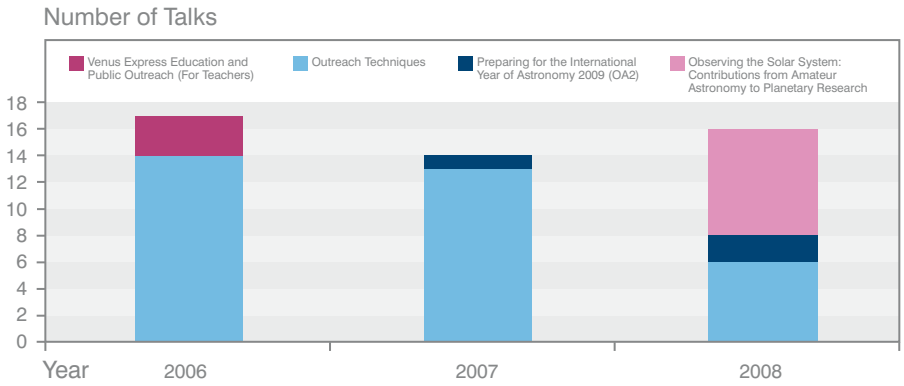

Figure 1 – Talks given at the ESPC for the period 2006-2008.

One of the motivations for organisers to make time for outreach sessions in what are usually very crowded conference timetables is that they can provide a good opportunity for scientists to come into contact with current outreach activities, with a view to encouraging them to do more in future. Although, this is not a new phenomenon, the true value for both the scientific community and other communicators has received little attention. So are these networking opportunities helping scientists and science communicators to work together better to share discoveries with the public? This article looks at the experiences of the EPSC outreach sessions.

European Planetary Science Congress outreach sessions

The annual EPSC covers a wide range of planetary and space science topics, including outreach sessions. The three five-day meetings held so far (Berlin 2006, Potsdam 2007 and Münster 2008) have proved that European planetary scientists do want to meet together on "home soil", with around 600 scientific abstracts submitted and an average of 500 participants every year. The EPSC programme is very much put together in a "bottom-up" manner. Each year a call goes out to members of the EuroPlaNet community for them to suggest topics on which they would like to see sessions, and — once the sessions have been decided — there is a subsequent call for scientists and groups of scientists to propose talks and posters. So the programme very much reflects what is on the minds of European planetary scientists during the previous six to nine months.

Studies based on a relatively young conference are clearly not very reliable. But adding up the number of sessions gives some idea of the importance that is being attached to various activities. Major themes in the 2008 EPSC, for example, included Saturn's moons, Titan and Enceladus, the Moon itself and Mars. Comparing year-on-year also indicates changing priorities; a hot topic in 2006 and 2007 was the magnetosphere of Saturn, as probed by Cassini and from the ground, but this area had cooled somewhat by 2008 (Figure 1).

The 2006 EPSC showed that participants were very keen to have outreach activities discussed. A whole day was scheduled for outreach sessions, and there were 26 accepted contributions for the main open session on Outreach Techniques (see Table 1). In the event, several of these presentations were either not given, as the speakers were unable to attend, or were "merged" by the session organisers because one speaker or group had offered a number of talks, and time simply did allow for all to be presented. Scientists involved with Venus Express organised a special session for local teachers, so that they could be presented with the latest findings from Earth's "evil twin" planet, and be given materials that they could use in the classroom. A final evening session turned into a discussion about a topic that had caught the public imagination across the globe — whether or not Pluto should have remained as the ninth full planet or should have been "demoted" to dwarf planet status.

In 2007, there were just two timetabled sessions, one on Outreach Techniques, as before, and one workshop on preparations for the 2009 International Year of Astronomy (IYA2009). The general session on techniques attracted 14 accepted contributions (see Table 1). These showed a somewhat more reflective nature, with phrases such as "the good, the bad and the ugly", "learning" and "challenges" showing that the contributors were not simply out to "wow" the audience with the latest tricks of the trade, but were also genuinely trying to pass on wisdom hard won from looking at what did not work, as well as what did (always a more pleasant job).

The EPSC outreach sessions have to compete with several more traditional science-focused sessions all running in parallel. At the 2008 meeting in Münster, the involvement of the local university, and the attraction of a European astronaut, brought several hundred local citizens to the congress venue for the evening public meeting held outside of the main congress schedule. This talk was given in German, unlike the rest of the congress, for which English was the only accepted language.

As with 2006, EPSC 2008 saw three outreach sessions (see Table 1). With IYA2009 so close, there were six accepted contributions under the heading "Preparation for IYA2009". Agencies such as ESA and NASA presented their plans and discussed potential co-operations during the IYA2009. An example is the interest manifested by ESA in contributing throughout its IYA2009 activities to the JPL's project "Cassini Scientist for a day program" — an essay competition primarily for students aged 5–11 in the United States, which has recently been adopted in Britain, with a version for UK students aged 11–18. ESA also shared that its IYA2009 resources are adaptable and easily translated into other languages. Examples are *The Lives of Galileo* (a cosmic comic book) and the *Eyes on the Skies* (DVD movie and book), which have been designed for the public at large.

In 2008, only three accepted contributions were listed in the general Public Outreach session. However, there was considerable interest in the session on the Contributions from Amateur Astronomy to Planetary Research. This session, with ten accepted contributions (again, not all were given), built on the growing interest and involvement of the amateur community with EuroPlaNet, a trend that the new network will build on in the years from 2009 onwards under FP7.

Participation in the EPSC outreach sessions

Until recently, science communicators were mostly not involved in scientific con-

Table 1. Outreach sessions at ESPC for the period 2006-2008.

2006 Sessions[5]

Outreach Techniques Session (OA1)

- UK goes to the Planets
- An outreach experience
- A Virtual Tour of the Universe
- Hands-on Universe – Europe
- A quantative and qualitative analysis of science communication in the Greek mass media
- Communicating about space science and exploration: a two way street
- Dedicated Space Science Education Centres Provide the Model for Effective Outreach
- Mission to the Public: A Journalist's Experiences with European Astronomers and Space Agencies
- Cassini-Huygens Communication -Think Globally, Act Locally
- Cassini-Huygens Outreach: It takes a village to reach the world
- 3D animations explaining the rotation, libration, and tides of planets
- Mars in their eyes – a cartoon exhibition
- The Planetary Society and EuroPlaNet Outreach
- Astronomy journalist views

Venus Express Education and Public Outreach (For Teachers) Session (OA2)

- Introduction on the Science objectives of the Venus Express mission
- Demonstration on how actual data from the mission can be used to teach your students required physical science concepts.
- The unsolved mysteries of Venus learning modules.

2007 Sessions[6]

Outreach Techniques Session (OA1)

- Planetary Science from the Teaching Department of Paris Observatory
- An outreach activity at the frontier of science: the Planeterrella
- New opportunities in public outreach
- Virtual presence for mission visualization: computer game technology provides a new approach
- Communicating Astronomy in Europe: Strategies and Challenges in International Organisations
- Cassini Education and Public Outreach: Lessons Learned – It Takes A Village to Reach the World
- The good, the bad and the ugly – learning good practice in science communication through experience
- European Hands-on Universe
- Public and schools learning about the Solar System
- Communicating Astronomy with the Public
- The Pluto Affair: The good, the bad or the ugly?
- Media perspective – new opportunities for reaching audiences
- Film and Science Education: the combination

Preparing for the International Year of Astronomy 2009 Session (OA2)

- Communicating Astronomy: IYA2009 planning of outreach activities

2008 Sessions[7]

Preparing for the International Year of Astronomy 2009 Session (OA1)

- Virtual space exploration: let's use web-based computer game technology to boost IYA 2009 public interest
- European participation in the JPL Cassini Scientist for a day program
- ESA's plans for IYA2009
- Copernicus Project for the International Year of Astronomy
- What's Up? Use the night sky to engage the public through amateur astronomy in IYA
- How to engage the Media in International Year of Astronomy

Public Outreach Session (OA2)

- Bootleg Postcards, the unofficial biography of Spirit and Opportunity
- Public's opinion on space exploration in Germany

Observing the Solar System: Contributions from Amateur Astronomy to Planetary Research Session (OA3)

- Making data from amateur astronomers scientifically useful
- Modern techniques of planetary imaging in use by amateurs and their application to the study of the atmospheric dynamics of Jupiter and Saturn
- JUPOS: amateur analysis of Jupiter images with specialized measurement software
- Seasonal Change on Titan's - HST, Cassini and Amateur Observations
- Stormy season on Saturn?
- Equinoxes on Jupiter and Saturn in 2009: call for observations
- Venus in Infra Red light - ground to ground with amateur equipment
- Measurement of stellar occultations

gresses themselves. Activities to foster public awareness, understanding, and engagement with science have been normally discussed in science communication congresses organised for that purpose, such as the international Public Communication of Science and Technology (PCST) biennial congress or the BAAS Science Communication conference.

The outreach sessions at EPSC, however, have proved to be a good place to generate fruitful discussions: outreach experts give presentations (~15 minutes each) followed by questions from participants. When asked, many of the participants said that they valued having focused discussions about communicating astronomy. Furthermore, they said they would participate in future as it is an excellent opportunity to be aware of what others are doing in the field. Moreover, participants appreciated that integrating the outreach sessions into a general scientific conference provided immediate contact for those involved with the latest achievements in the discipline and created stronger links within the planetary scientific community.

Average attendances at the daytime sessions, during the main congress itself, have been reasonable, but not spectacular — 30–40 — with participants from scientific institutions and space agencies such as ESA and NASA, artists, science journalists and amateur astronomers. The location of all three EPSCs in Germany is not an accident. This has been arranged so that eastern European countries such as Romania, Hungary, Ukraine and Russia could be well represented. Indeed, they have contributed to the outreach sessions. There has also been a good representation from the United States and Australia.

One issue of note is that, while outreach and media professionals have been well represented in these sessions, not many working scientists have been present. This is not completely surprising given that many other EPSC sessions occur at the same time, but it does show that the outreach sessions are not a priority for most of them. Clearly there is still a great deal to do to sensitise and encourage more scientist participants to attend the outreach sessions.

Conclusions

It is our aim here to reflect on the role the EuroPlaNet outreach session's initiative might play in reinforcing links between science and society.

The first is that the EuroPlaNet outreach sessions appear to have made a name for themselves. They have been successful in stimulating debate and discussions between professional communicators such as journalists, public information officers, astronomy amateurs, artists and the scientists themselves. We believe that they are a good opportunity for professionals working on the same scientific discipline to share resources and materials with one another and keep them in touch with the latest scientific achievements through contact with the broader scientific community.

Even though the number of attendees at the sessions has been more or less constant over the three-year period, they were mostly

professionals of communication. The lower numbers of scientists present indicate that EuroPlaNet will have to work hard to deliver on its promises to engage the scientific community in future years. With the added emphasis on "users" — industry, politicians and ordinary citizens — envisaged under the EC's FP7 programme, such outreach sessions have the potential to develop public engagement in planetary science still further. In addition to being a forum for discussion, these sessions may also recruit and empower planetary scientists to play an active role in initiatives directed towards the communication of science.

Looking into the future

The EuroPlaNet project has changed from a purely networking activity to a research programme that will deliver results through the Joint-Research Activities/TransNational. EuroPlaNet will have a dedicated outreach/media team of three part-time workers, who will be proactive in bringing outreach opportunities to the attention of the planetary science community and the public. One of EuroPlaNet's planned outreach activities is to offer training in communication skills aimed at young researchers and PhD students. Giving them opportunities to develop their communication skills may encourage them to do more in future. Another strategy is the creation of a Media Centre aimed at strengthening relations between scientists and the media. This will work as a platform to seek out European sources of news in astronomy and space science, and to let the public know what Europe is doing in space and planetary sciences. We believe that these and other EuroPlaNet initiatives might help to forge relations between science and society and result in a more informed public supportive to space sciences and science in general.

Acknowledgments

We acknowledge the Portuguese Science and Technology Foundation (FCT) for funding Marta Entradas's research at UCL, UK. We also thank Norma Morris, Anita Heward and Jean-Pierre Lebreton for helpful discussions about this paper.

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Notes

[1] Mars Express Mission's gallery available at: http://www.esa.int/SPECIALS/Mars_Express/index.html-Phoenix Mars Mission's gallery available at: http://phoenix.lpl.arizona.edu/

[2] http//www.esconet.org

[3] EuroPlaNet membership consists of scientists working in 60 European institutes and space agencies representing 17 European nationalities. More information can be found on: http://europlanet.cesr.fr or www.europlanet-eu.org.

[4] http//www.europlanet-eu.org

[5] http//www.cosis.net/members/meetings/programme/session_programme.php?m_id=34&p_id=229&day=1&view=session

[6] http//www.cosis.net/members/meetings/programme/session_programme.php?m_id=47&p_id=288&day=1&view=session

[7] http//www.cosis.net/members/meetings/sessions/oral_programme.php?p_id=348&s_id=6021

Biography

Marta Entradas is a PhD student in Science Communication in the Dept. of Science and Technology Studies at University College London, UK. She is interested in the relationship between science and society, science communication, and public engagement with science and technology. She is also a trainer on ESConet (European Science Communication Network).

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