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Gaia outreach activities in Spain

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Abstract

For many years the Spanish teams involved in Gaia have done a big amount of outreach activities addressed to students and general public. The activities reach their maximum with the launch event on December 19th, 2013, but it will follow during the 5 years of mission. We describe in this paper some of those outreach activities. Note that it is not an exhaustive list, and for sure not all the activities developed by Spanish teams are mentioned here.

1 Introduction

Gaia is a cornerstone mission of the European Spatial Agency. It was launched on December 19th, 2013 from Kourou and, after a commissioning phase, it started its nominal observations in July 2014. The main goal of Gaia is to generate the most accurate up to date 6D map (position and kinematics) of the Milky Way, by observing one billion stars. Moreover, Gaia data will allow determine some physical parameters of the stars, as temperature or chemical composition. The impact of the Gaia mission will be substantial in almost of the fields of the Astronomy. Apart from the most obvious impact in the structure and dynamics of the Milky Way, fields as stellar evolution, exoplanet detection, determination of accurate orbits for solar system objects or even cosmology and fundamental physics will take profit of the final Gaia data.

But Gaia is also a great opportunity to bring science in general and Astronomy in particular to the students and general public. The mentioned wide range of topics covered by the mission allows to explain to the public not only the technical aspects of the mission, but also such diverse topics as the Solar System history, the concept of parallax, the distance ladder or the General Relativity Theory.

In the next sections we show some of the outreach activities developed in Spain about the Gaia mission.

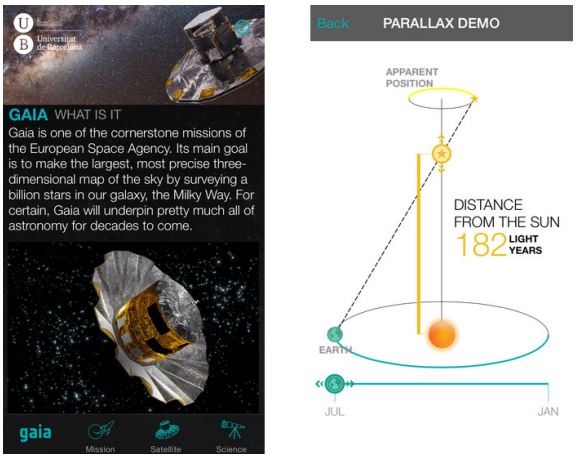

Figure 1: Two screens of the Gaia app.

2 The Gaia mission app

The Gaia Mission app is an interactive application for mobile devices designed to discover the details of the Gaia mission (see Fig. 1). All aspects of the mission are covered, from technical issues to the science behind it. The application is designed to keep users engaged during the whole mission and build interest on the mission achievements while stimulating enthusiasm for astronomy. It is available for both Android and iOs devices. Up to date (December 2014) has been downloaded more than 2 000 times.

3 The Gaia exhibition One billion eyes for one billion stars

The exhibition is made up of 12 panels, covering from the history of the astrometry to the scientific challengers of Gaia (see Fig. 2). It is available in Spanish, Catalan, English and German. The exhibition has been exposed in universities, primary and secondary schools, public libraries, etc. In some cases we have offered guided visits to the exhibition. It has been visited for more than ten thousands of people. There are several copies of the exhibition spread around Spain. If you are interested on it, visit `http://serviastro.am.ub.edu/twiki/bin/view/ServiAstro/ExpoGaia`.

4 A 3D model of the Gaia payload

Gaia has two telescopes composed by six mirrors each one, although two of them are shared by both telescopes. With this configuration the light suffers several reflexions before to reach the focal plane. Based on a 3D model of the Gaia payload, the Universidade da Coruña team added small mirrors to the model to show the optical path using a laser beam (see

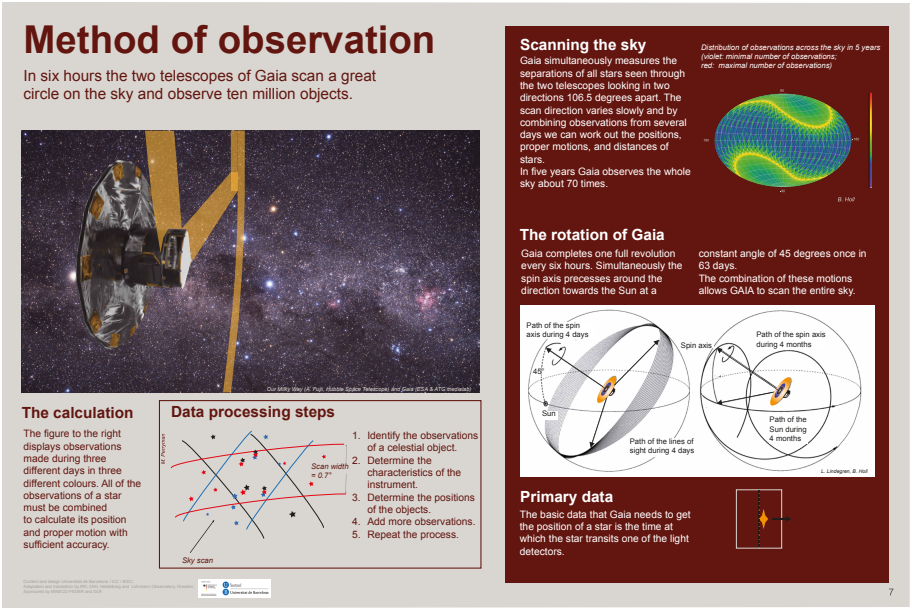

Figure 2: A panel of the *One billion eyes for one billion stars* exhibition.

Fig. 3). The model is used to show to the audience how the telescopes work and has been used together with the Gaia exhibition.

5 Videos

The video *La misión Gaia* shows the Spanish participation on the project. The video is split in five sections, and explains the details of the Gaia mission, with spectacular 3D animations and interviews with Spanish experts working on the mission (see `http://gaiavideo.ub.edu/`). The video was an initiative of the Universitat de Barcelona team with the collaboration of others Spanish teams involved in Gaia.

On the other hand, the Universidad Nacional de Educación a Distancia (UNED) has produced a 10 minutes video showing several aspects of the mission. It is available at `https://www.youtube.com/watch?v=sDRFO7K6-W8`.

6 Talks

The number of talks devoted to the Gaia mission in the last years is countless. To a greater or lesser extent, all the Spanish groups involved in the mission has organized such activities. The public is quite different, from students (primary, secondary and undergraduates) to general public, but also amateurs astronomers. Although is very difficult to estimate the number of assistants, probably it reach several thousands.

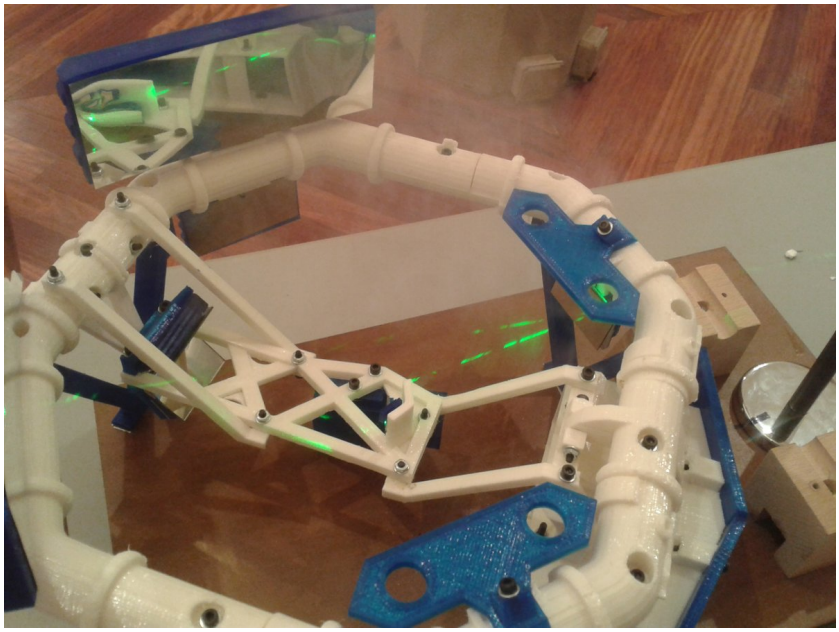

Figure 3: A 3D model of the Gaia payload showing the optical path.

7 The launch events

The Gaia satellite was launched on December 19th, 2013. The launch was broadcast thought ESA-TV and several faculties open the doors to allow the public to follow the event live. Also some primary and secondary schools followed the launch, with the help of one o more scientists working in the mission. In some places the event was complemented with talks about the mission and the Gaia exhibition.

8 Conclusions

The outreach activities organized by the Spanish Gaia teams is a good example of how an spatial mission as Gaia can be used to explain science to the students and general public.

Apart from the activities described in this paper, there was many others, as the publication of brochures and calendars. All those activities have contributed to a strong presence of Gaia in the communication media.

Acknowledgments

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