

Gaia mission outreach activities.

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Abstract

Gaia is an European Space Agency (ESA) mission in charge of charting a three-dimensional map of the Milky Way. In addition to its huge impact on all fields of Astrophysics that is already taken place, Gaia is a very good opportunity to do astronomical outreach activities for the general public. In this sense, we have prepared, together with other people from the Gaia community, different materials and activities to bring Gaia to a wide audience, from schools to amateur astronomers. In this paper we present some of these materials.

1 Introduction

Gaia is an European Space Agency (ESA) mission in charge of charting a three-dimensional map of our Galaxy, the Milky Way. In doing so, it provides a census of about one and a half billion stars, which amounts to about 1.5 per cent of the Galactic stellar population. The second Gaia Data Release (Gaia DR2) was published on April 2018.

From the beginning of Gaia, outreach and educational activities around the mission has been considered as key activities. Gaia is a great opportunity to bring science in general and Astronomy in particular to the students and general public. The 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 material and activities developed to this aim.

2 *Gaiaverse*

The *Gaiaverse* portal (<http://gaiaverse.eu>) is devoted to the outreach of Gaia in the framework of the GENIUS project, an European project (finished in 2018) whose aim was to contribute to the design, implementation and operation of the Gaia archive system. GENIUS

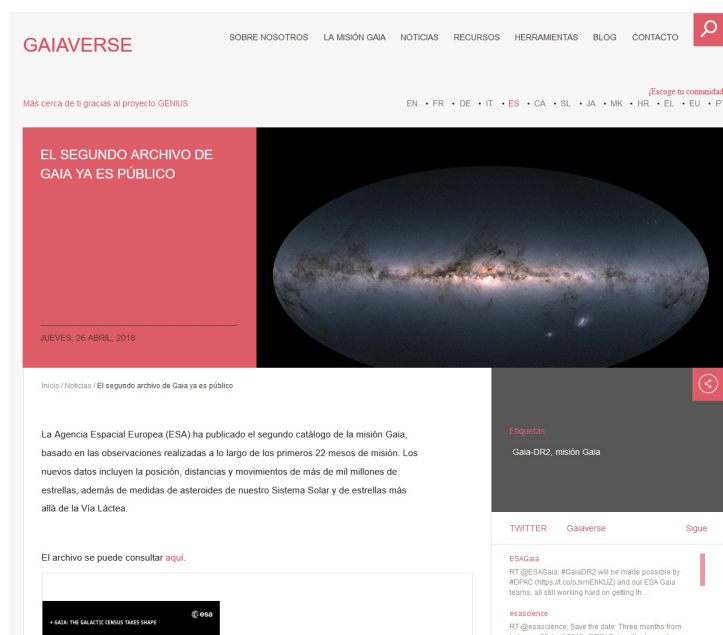


Figure 1: The *Gaiaverse* portal.

aims at becoming a hub of Gaia’s spreading knowledge by collecting all kind of outreach materials such as presentations, videos, posters, brochures, tools, news... which are all available through this portal, *Gaiaverse*.

The portal is translated to eleven languages (English, French, German, Italian, Spanish, Catalan, Slovak, Japanese, Macedonian, Croatian and Greek). A version in Euskara is currently under development. The contents in each languages could not be exactly the same. For instance, some local news could be present in only one version of the portal. In this sense, we prefer to speak of ”eleven communities” more than ”eleven languages”.

Gaiaverse is addressed to the general public. It is complementary to the official ESA’s portal (http://www.esa.int/Our_Activities/Space_Science/Gaia). It has several sections, from the latest news of the mission, to a repository of outreach material. The portal is administrated by the Universitat de Barcelona (UB) and the Consorci de Serveis Universitaris de Catalunya (CSUC).

3 One billion eyes for a one billion stars

The exhibition *One billion eyes for a one billion stars* was originally designed and created in 2013 at the Universitat de Barcelona. At the beginning it was composed by 14 posters, covering both the scientific and the technical aspects of the Gaia mission. With the release of the first (September 2016) and second (April 2018) Gaia catalogs, new posters were added to explain the contents of the catalogs and the first scientific results of the mission.

Currently the exhibition is composed of 20 posters. Apart from the whole exhibition,



Figure 2: One of the posters of the *One billion eyes for a one billion stars* exhibition.

two possible itineraries with less posters are available, one of them focused in the technical aspects behind the mission and other focused in its scientific aspects. The exhibition is translated to English, Spanish, Catalan and German. A on-line version is available at <http://www.am.ub.edu/twiki/bin/view/ServiAstro/ExpoGaia>.

4 Gaia Data Release 2: A guide for scientists

This set of 15 videos has been created by Stefan Jordan, from the Astronomisches Rechen-Institut (ZAH, Universität Heidelberg) and Klaus Jäger. Each video covers a different topic of the mission, explained by an specialist in the field, all of them directly related to Gaia consortium. The videos are addressed to people interested on the contents of the Gaia DR2 and how to use it. They are available at <https://www.cosmos.esa.int/web/gaia/guide-to-scientists>.

5 Gaia Sky

Gaia Sky is a real-time, 3D, astronomy visualisation software that runs on Windows, Linux and macOS. It is developed in the Gaia group of the Astronomisches Rechen-Institut (ZAH, Universität Heidelberg). Gaia Sky is an open source project. It offers the possibility to generate videos for outreach, showing for instance the proper motion of the stars or allowing to travel across the Milky Way. The current version uses the Gaia-DR2 data. For more information, visit <https://zah.uni-heidelberg.de/institutes/ari/gaia/outreach/gaiasky>.

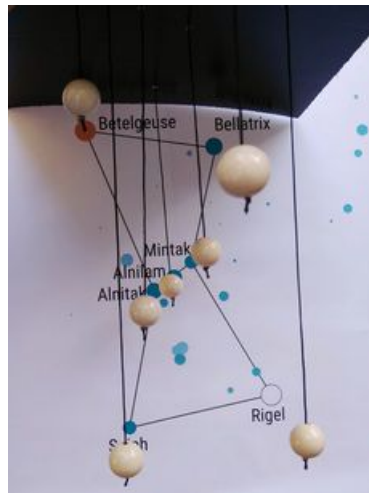


Figure 3: 3D model of the Orion constellation.

6 Other material and activities

- Bookmark - rule with the distance scale of the Universe.
- Memory game with 20 pairs of images related to the Gaia mission.
- 3D constellations. This activity for the schools allows to built a 3D model of the Orion constellation to emphasize the different distances of the stars of the constellation. Also allows to change the point of view of the observer. See figure 3.

Acknowledgments

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