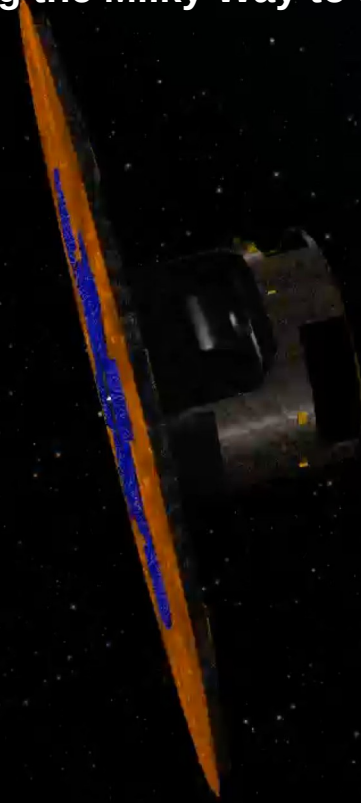


Gaia Outreach

MW-Gaia: Bringing the Milky Way to schools2021



Stefan Jordan

Astronomisches Rechen-Institut

Zentrum für Astronomie

Universität Heidelberg

Gaia scanning the sky for Gaia EDF
S. Jordan & T. Sagristà with Gaia SK

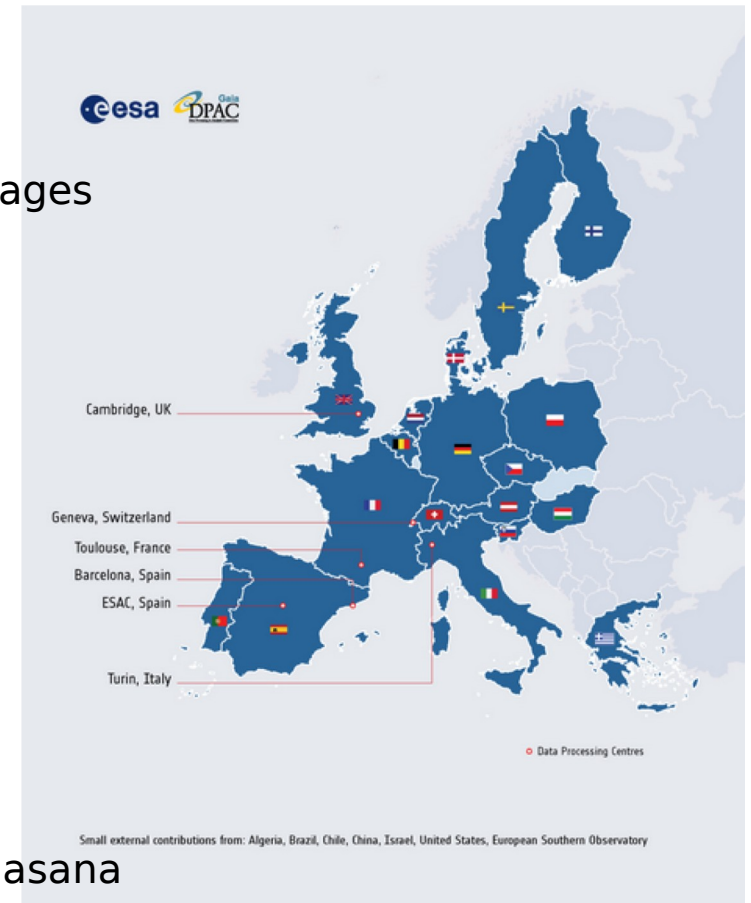
DPAC: Gaia Data Processing and Analysis Consortium

Responsible for the production of the Gaia catalogues

- More than 400 astronomers and software engineers
- Divided into nine Coordination Units and many work packages



About half of those working on Gaia
DPAC Consortium meeting in Padua (1-5.10.2018)
DPAC = Data Processing and Analysis Consortium
Responsible for DPAC outreach: Stefan Jordan, Eduard Masana



ESA Gaia Cosmos Page

Home Data Mission People & Institutes News & stories Science Results Resources Questions

GAIA MISSION STATUS
2499 days in science operations
93,070 GB of science data gathered
176,711,029,305 transits observed

UPCOMING EVENTS

- 1 - 4 June 2021**
Gaia EDR3 workshop (Virtual)
- 7 - 11 June 2021**
The predictive power of computational astrophysics as a discovery tool (Chamonix - France)
- 28 June - 2 July 2021**
European Astronomical Society- Annual Meeting (Leiden, The Netherlands)

[View Conference / Event Calendar](#)

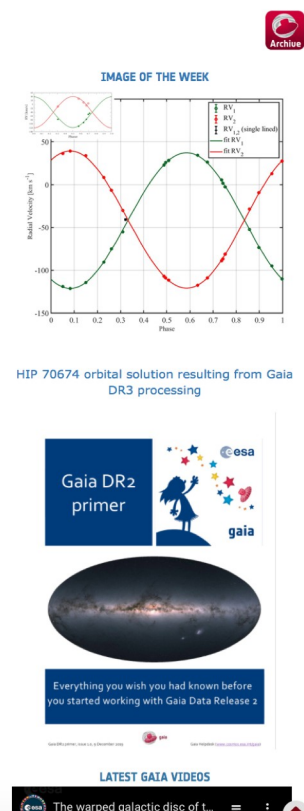
NEWS & HIGHLIGHTS

- 20/05/2021 Downtime of some Gaia services**
An unexpected downtime affected some Gaia services. Some emails to DPAC mailing lists might have been delayed.
- 21/04/2021 Postdoctoral research position open**
Postdoctoral research position open at the Institute for Astronomy in Heidelberg. More info here.
- 10/03/2021 Gaia EDR3 crossmatch tables released**
The remaining crossmatch tables: GSC 2.3, APASS dr9, RAVE dr5, 2MASS PSC XSC, and allWISE are now all available from the [Gaia Archive](#). They are also available from the bulk download section. The data release documentation has been updated accordingly. Make sure to get the most up to date version from our documentation pages.
- 08/03/2021 Gaia-TESS collaboration kicks off**
TESS (Transiting Exoplanet Survey Satellite) is a NASA space mission surveying nearby bright stars in search of extrasolar planets, pushing ahead the fast-growing and exciting study of planets outside our solar system. TESS finds planets that cross our line of sight to their host stars, causing a periodic dimming of the observed light of the system. TESS is issuing a monthly list of newly discovered candidates of transiting exoplanets. However, TESS angular resolution allows light of each target star to be blended with the light from nearby sources. Therefore, follow-up photometric observations are required in order to exclude apparent transits caused by blending with nearby eclipsing binary stars, before further confirmation observations should be performed.
The Gaia mission has been accumulating brightness measurements of billions of stars, with a high angular resolution, producing distinct brightness time series for all sources whose light might be blended with the TESS planet-host candidate. Therefore, Gaia can quickly identify false positive candidates and even confirm true planets in some cases, synergistically combining the capabilities of two of the astronomical space flagships of the USA and Europe - TESS and Gaia.
The analysis of the Gaia relevant data is done at Tel Aviv University by Aviad Panahi, Tsevi Mazeh and Shay Zucker as members of the Gaia DPAC/CU7 team, and the results are reported to the [TESS Quick Look Pipeline](#) manager at MIT and [TESS Follow-up Observing Program Working Group \(TFOPWG\)](#) coordinator.
- 03/02/2021 Lodewijk Woltjer Lecture for Amina Helmi**
The [European Astronomical Society \(EAS\)](#) announced yesterday that the [2021 Lodewijk Woltjer Lecture](#) has been awarded to Prof. Amina Helmi of the University of Groningen for advancing the understanding of how the Milky Way assembled using dynamical simulations combined with Gaia observations of distances, velocities, ages and chemical abundances of stars. Amina Helmi is a member of the Gaia Data Processing and Analysis Consortium and plays a role in the validation of the Gaia data.
- 03/02/2021 New release of the Gaia Data Release Documentation**
Today a [new release of the data release documentation for Gaia EDR3](#) was published, in anticipation of the release of the second part of the crossmatch tables, which is expected very soon now.
- 16/02/2021 EAS meeting 2021 - Gaia: The (2) Billion Star Galaxy Census: The Science of EDR3 and the promise of DR3**
Registration and abstract submission is now open for the [EAS 2021 meeting 28 June - 2 July 2021](#). As part of the EAS meeting, a two-day [MW+Gaia / GREAT / Gaia](#)

OBJECTS IN THREE DIMENSIONS
for the Gaia Scientific Community

IMAGE OF THE WEEK

HIP 70674 orbital solution resulting from Gaia DR3 processing



LATEST GAIA VIDEOS
The warped galactic disc of L...

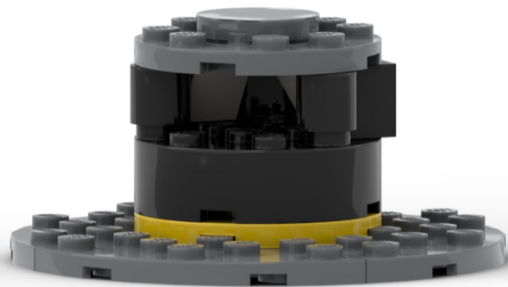


<https://cosmos.esa.int/web/gaia>

Building a mini Gaia with Lego

The Gaia Space Telescope

Mapping over a billion objects in our Milky Way



https://www.cosmos.esa.int/documents/29201/4897379/pacecraft_building_instructions.pdf/815451ed-dd5a-d58cdf1-0c7ffc564f7c

<https://www.cosmos.esa.int/gaia>
design Courtesy William Taylor



Outreach for the newest Gaia catalogue: Gaia Early Data Release 3

Main focus on four science demonstration papers:

- The Gaia Catalogue of Nearby Stars: The 100 pc sample
- The 3D structure and properties of the Magellanic Clouds with Gaia EDR3
- The Galactic anti-centre in EDR3
- Acceleration of the solar system from Gaia astrometry



<https://www.cosmos.esa.int/web/gaia/edr3-st>

Local events on the occasion of Gaia EDR3 in 15 countries

<https://www.cosmos.esa.int/web/gaia/edr3-events>



FOLLOWING THE JOURNEY OF STARS ACROSS THE SKY



COORDINATION UNIT 3



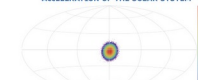
GAIA CATALOGUE OF NEARBY STARS



CUS - A HUMAN STORY



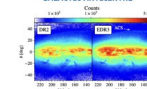
ACCELERATION OF THE SOLAR SYSTEM



GAIA DPAC



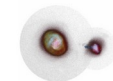
GALACTIC ANTICENTRE



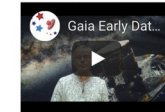
GAIA EDR3 VS GAIA DR2



A DIVE INTO THE MAGELLANIC CLOUDS



GAIA EDR3 INTRO MESSAGE - ESA GAIA



GAIA EDR3 INTRO MESSAGE - GAIA DPAC



QUESTIONS AND ANSWERS



Hertzprung-Russel Diagram with Gaia EDR3



<https://youtu.be/QKXhtzjLZlI>



Gaia EDR3 stars closer than 125 pc or 400 lightyears Rohrbasser, K. Nienartowicz, L. Eyer, ESA/Gaia/D

Gaiaverse: In Several Languages (mentioned by Carme Jordi yesterday)

The screenshot shows the Gaiaverse website interface. At the top, the word "GAIERVERSE" is displayed in red. Below it, a navigation menu includes "ABOUT US", "THE GAIA MISSION", "NEWS", "RESOURCES", "TOOLS", "BLOG", and "CONTACT". A search icon is located in the top right corner. A sub-header reads "Brought to you by the GENIUS project" with a link to "Choose your community!" and a list of language options: EN, FR, DE, IT, ES, CA, SL, JA, MK, HR, EL, EU, PT.

The main content area is divided into several sections:

- NEWS** (red background): "GAIA MEMORY GAME" with the text "You want to train your memory? Gaia mission can help you with that while having fun!!" and an image of GAIA mission cards.
- NEWS** (dark blue background): "Gaia detects a shake in the Milky Way" with a sub-structure visualization image and text: "Gaia data help to discover substructures which were unknown so far in the Milky Way."
- NEWS** (dark blue background): "Gaia creates richest star map of our Galaxy – and beyond" with a Milky Way image and text: "ESA's Gaia mission has produced the richest star catalogue to date, including high-precision measurements of nearly 1.7 billion stars"
- RESOURCES** (red background): "ACCESS TO GAIA ARCHIVE" with a network diagram icon.
- TWITTER** (white background): "Gaiaverse" with a "Follow" button. It features two tweets: one from @ESAGaia about the GaiaDR2 release and one from @esascience about the Gaia-GOSA tool.
- BLOG** (white background): "Latest Post" with a link to "Gaia-GOSA, an interactive tool for ground-based observations" and a brief description of the tool.

At the bottom, there is a link: "GO TO THE OFFICIAL GAIA MISSION".

Currently not very active but will be used for the MW-Gaia outreach in the future.



<https://gaiaverse.eu>

Short explanation videos from Cambridge (already mentioned by Fraser Lewis yesterday)

Gaia in one minute

This is a series of six cartoons about Gaia. The first four cartoons listed below were created by Angel Eye Media and the Gaia team in Cambridge. You may download these cartoons in a range of formats from <http://sms.cam.ac.uk/collection/1638609>.

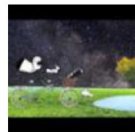
The other two cartoons were produced for Gaia by the Open University as episodes of "[60 Second Adventures in Astronomy](#)" series.

Why we need Gaia



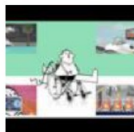
How old are the stars?
[Watch cartoon](#)

What's the big deal about Gaia?



Just how do you go about creating a 3D map of a galaxy?
[Watch cartoon](#)

How do we benefit from space?



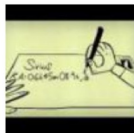
What's the pay-off for me?
[Watch cartoon](#)

Can I be part of Gaia?



Find out how you can get involved in Gaia and contribute to new and exciting discoveries in our Galaxy and beyond.
[Watch cartoon](#)

Taking a Galactic Census

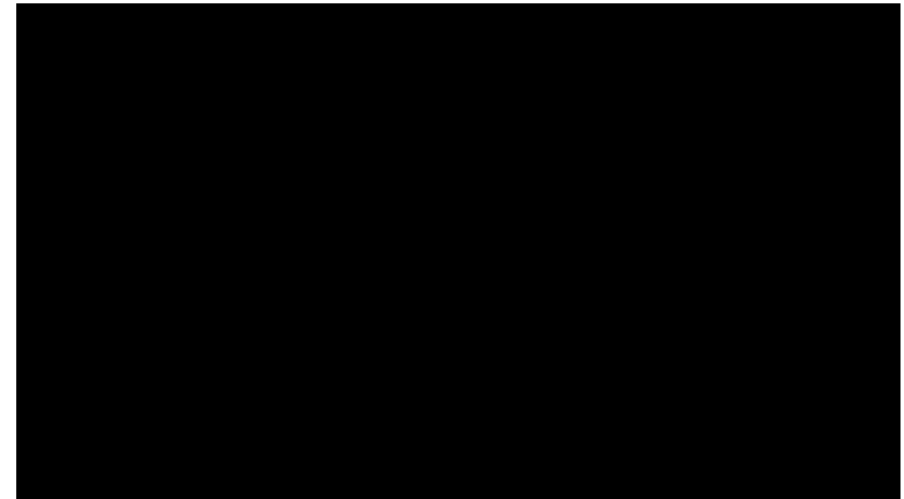


How do you take a census in space?
[Watch cartoon](#)

Gaia and the Killer Asteroids



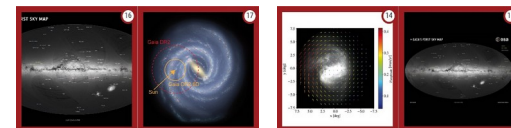
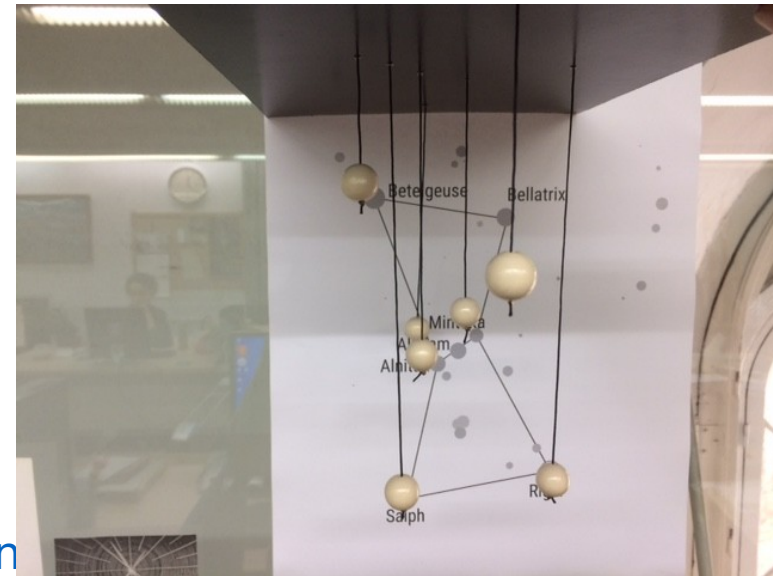
How will Gaia help us spot Killer Asteroids?
[Watch cartoon](#)



<https://www.gaia.ac.uk/multimedia/gaia-one-minute>

Gaia Teaching tools from University of Barcelona

- Bookmarks
- Memory Game: <https://gaia.ub.edu/?p=10302>
- 3 D constellations for schools: <https://serviastro.ub.edu/en/projects/constellations-in>
- Instructions to build (in Spanish): <https://serviastro.ub.edu/sites/serviastro/files/fitxers/019-09/constcast.pdf>



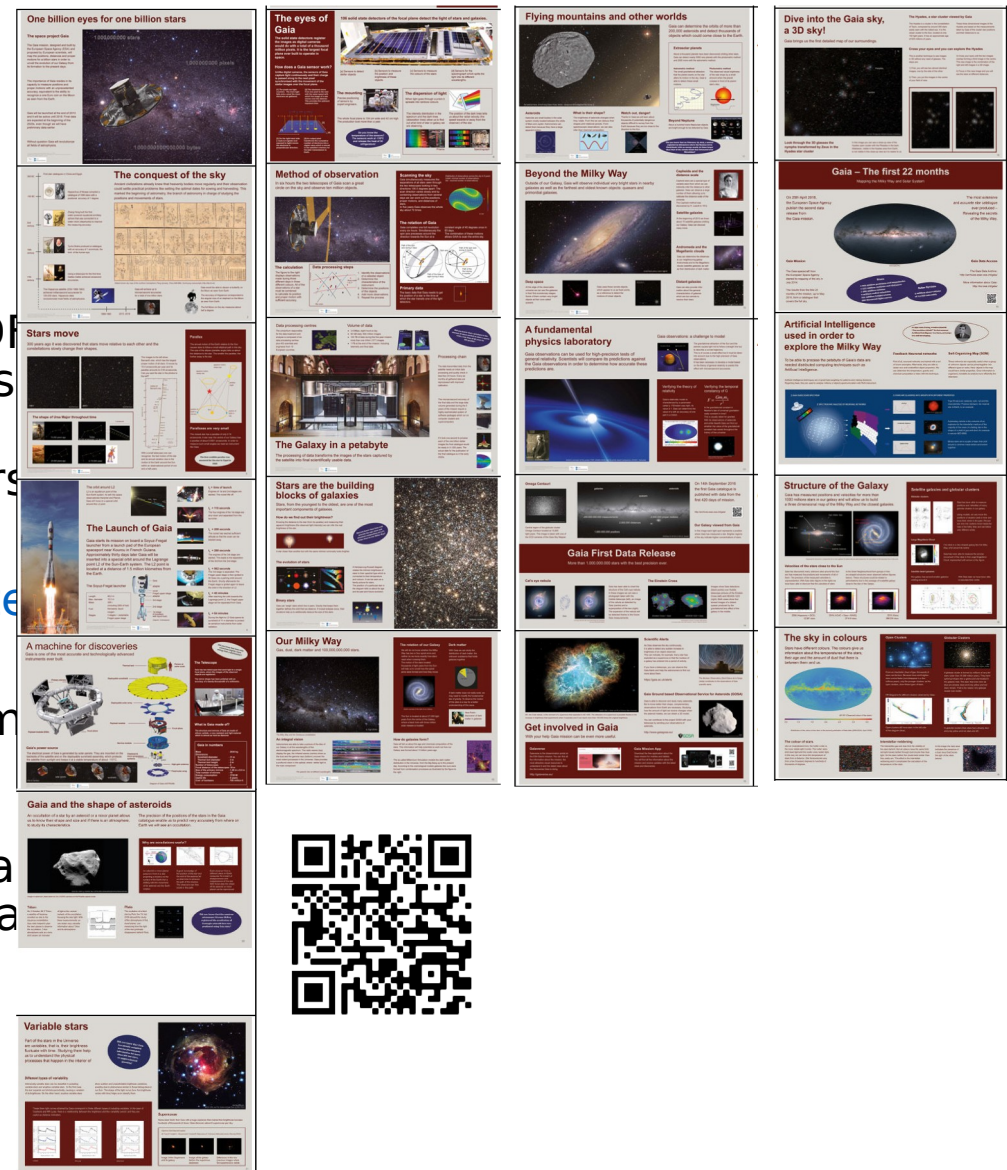
<http://www.ub.edu/laubdivulga/festacienciaub/festacienciaVII/bombolla-3d.html>

Gaia Posters

A set of 22 Gaia posters in English in PDF format. High and low resolution versions of the first 16 posters are provided (high resolution versions of the first 16 posters can be downloaded from

<https://gaia.geo.tu-dresden.de/GaiaPosters>

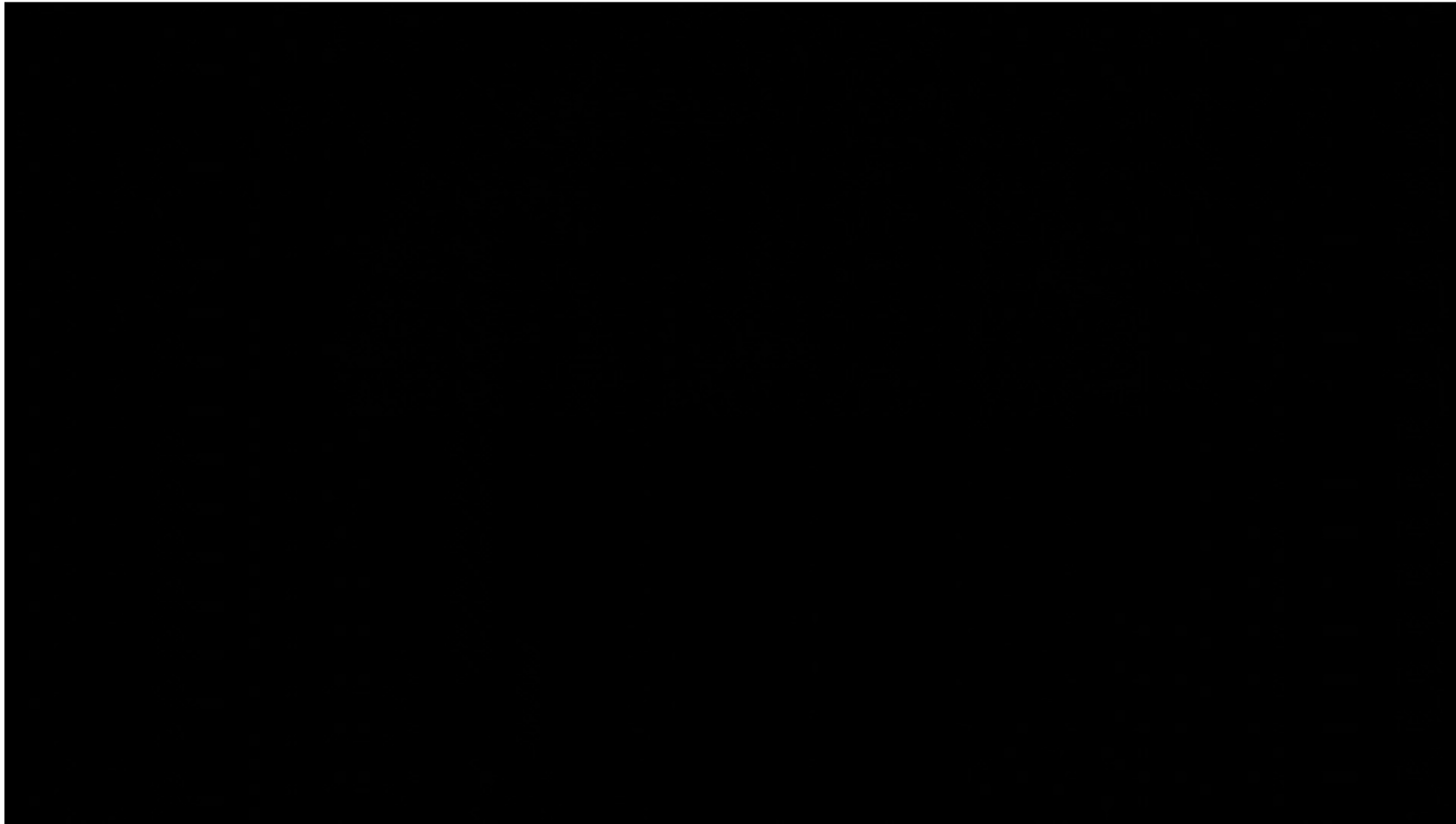
The posters, based on the original Gaia posters in Spanish prepared by the team from the **University of Barcelona**, were translated into English, improved, and technically implemented by the joint team from **ARI/ZAH**, University of Heidelberg and **Lohrmann Observatory**, Technische Universität Dresden



<https://youtu.be/qdW53IYXObI>



Gaia Sky Teaser Trailer



Gaia Sky tutorials:

<https://odysee.com/@GaiaSky>



Gaia Sky Teaser:



<https://t1p.de/godu>



GAIA SKY

An open source 3D universe simulator with support for more than a billion objects

Download Gaia Sky 3.0.3

linux | windows | macos | tgz
release date: 2021-02-25



Gaia Sky is a real-time, 3D, astronomy visualisation software that runs on Windows, Linux and macOS. It is developed in the framework of **ESA's Gaia mission** to chart about 1 billion stars of our Galaxy in the Gaia group of the **Astronomisches Rechen-Institut (ZAH, Universität Heidelberg)**.

- **Free and open source** - Gaia Sky is open and free, and will stay this way. Contribute to the development and translations.
- **From Gaia to the cosmos** - Move freely through the cosmos or explore the Solar System in a seamless manner!
- **Gaia** - Observe Gaia in its orbit and discover its movement in the sky and its attitude.
- **Virtual Reality** - The whole Universe in VR!
- **6D exploration** - Represents star positions but also proper motions and radial velocities, if available.
- **Planetary surfaces** - Explore surfaces with elevation maps (using tessellation, if available).
- **3D-ready** - With 6 stereoscopic modes: Anaglyphic (red-cyan), VR headset, 3DTV (H and V), cross-eye and parallel view.
- **360 mode** - With spherical (equirectangular), cylindrical and Hammer projections.
- **Planetarium projection mode** - MPCDI for real-time usage in multi-projector systems. Ready to produce videos for full domes from the desktop app.
- **Use your data** - Download pre-packed datasets (**Gaia eDR3**, NBG, SDSS, OADR2, etc.) or use your own, in **VOTable**, **FITS**, **CSV** and other formats (**STIL**).
- **Real-time filters** - Filter any dataset by distance, magnitude, galactic, ecliptic, equatorial coordinates, and more.
- **SAMP aware** - Implements **SAMP** commands to interoperate with SAMP-ready software such as Topcat and Aladin.
- **Navigate the galaxy** - Support for controllers and gamepads makes navigating the Galaxy a piece of cake.
- **Record and play your camera paths** - Ready to record and play camera paths off-the-shelf.
- **Scriptable and extensible** - Use Python to script and extend the capabilities of the Gaia Sky.
- **Internationalised** - Translated so far to English, German, Spanish, French, Catalan and Slovenian.



<http://www.zah.uni-heidelberg.de/gaia/outreach/gaia>



Nobel Prize Laureate George Smoot



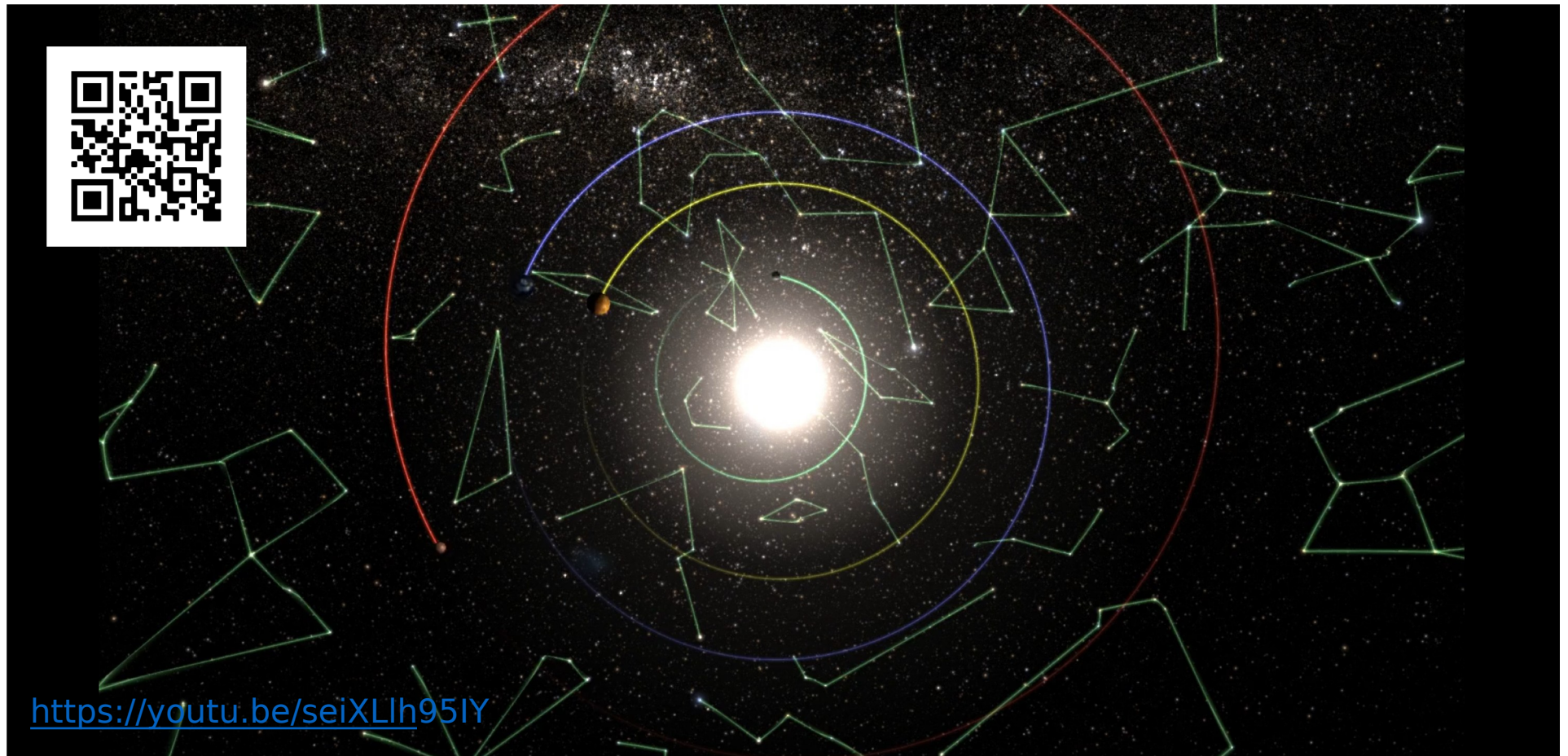
ESA Astronaut (SpaceX Crew-3) Matthias Munsch

Flying through the Galaxy with Gaia Sky



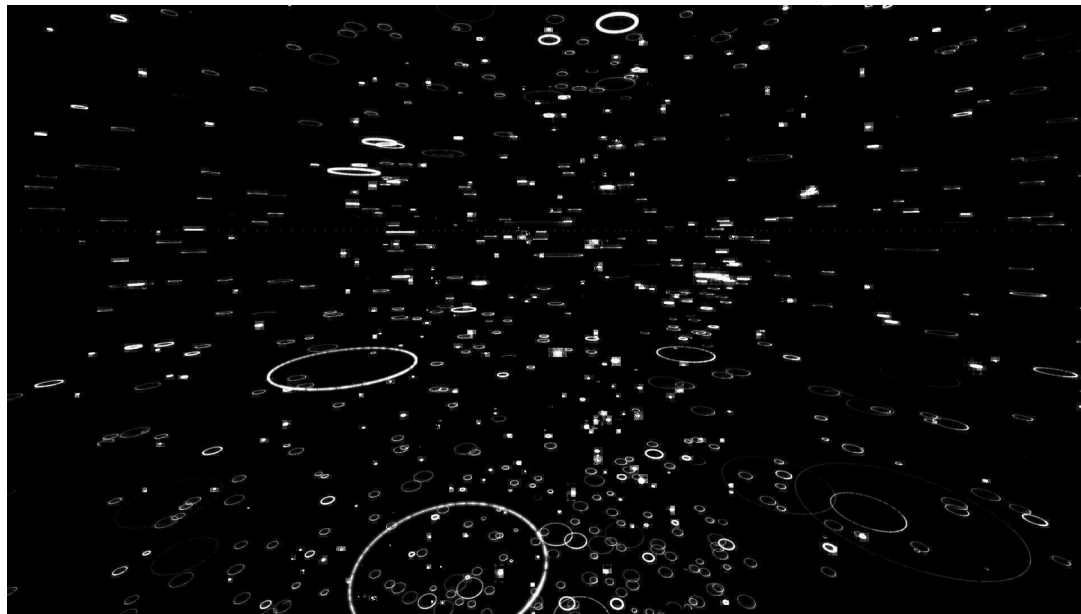
<http://www.zah.uni-heidelberg.de/gaia/outreach/gaiasky>

Video where we assume that the parallax are 100 000 times larger than in reality

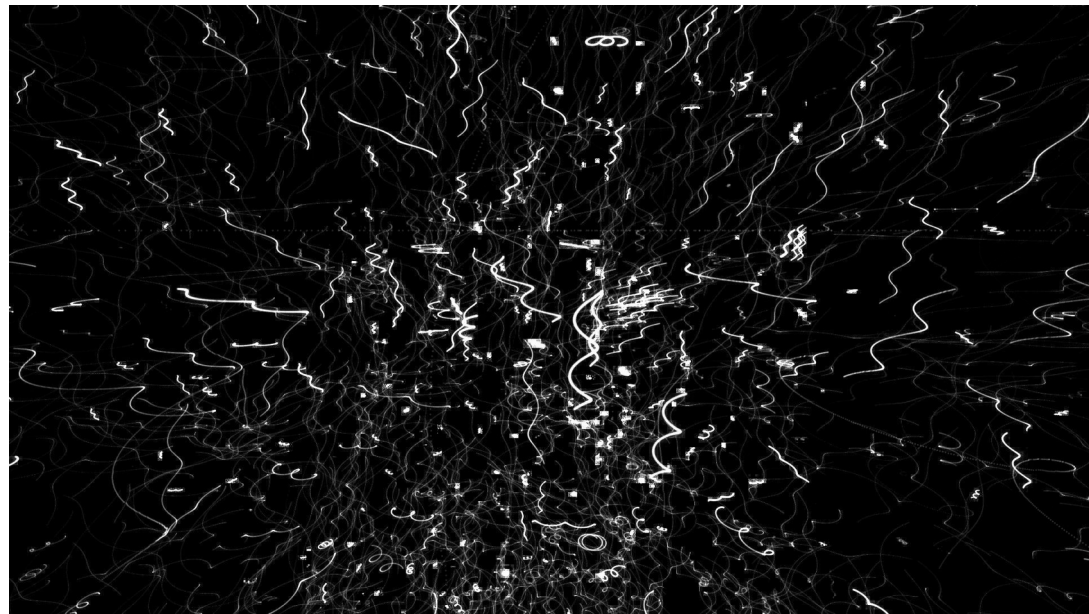


Video where we assume that the parallaxes are 100 000 larger than in reality

“Long exposures”



without proper motion, just parallax



parallax + proper motion

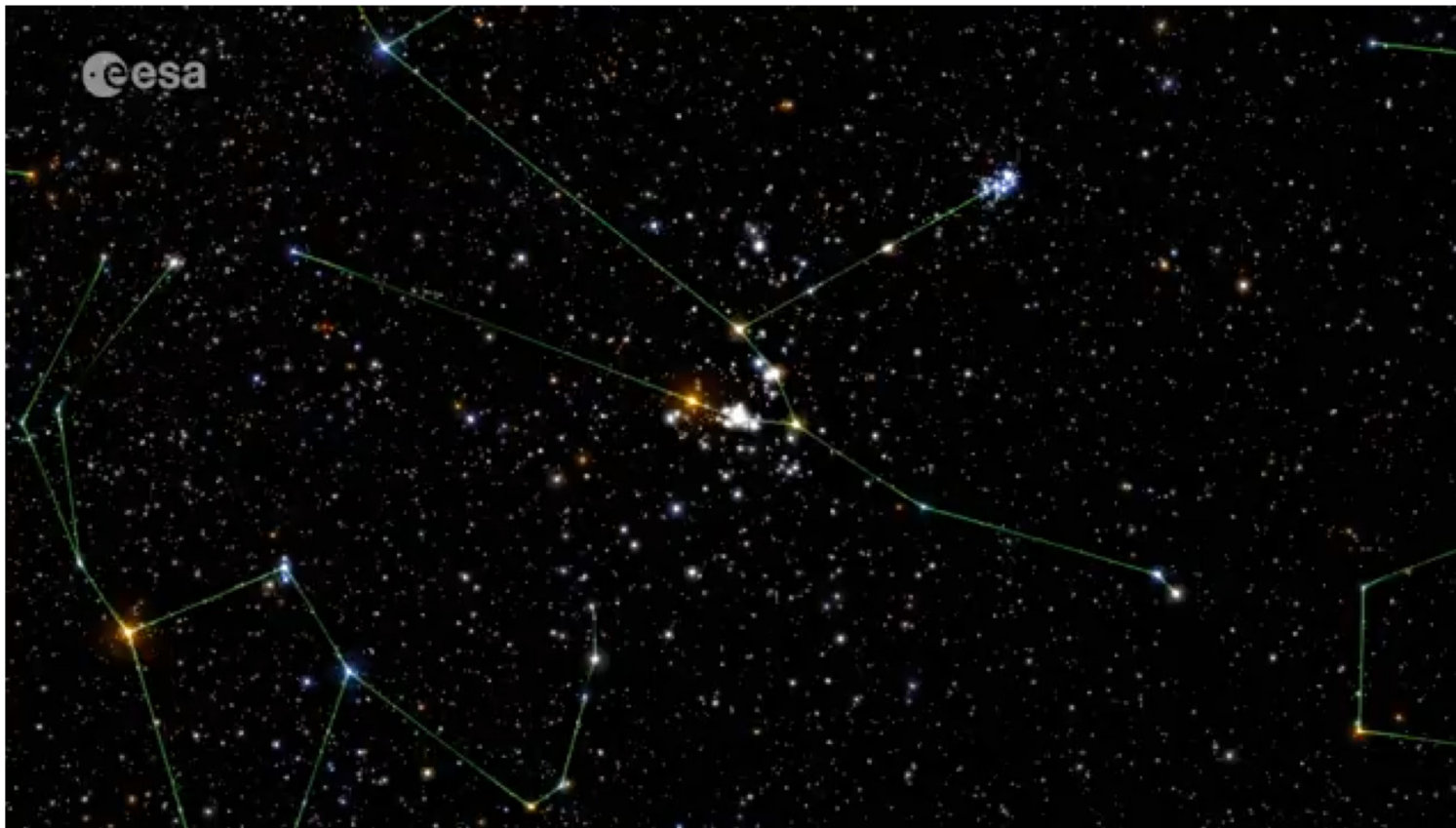


<https://youtu.be/seiXLh95IY>

Gaia Sky Videos Showing Gaia EDR3 Science

Example: Locating the Hyades tidal tails (more than 100 000 views)
<https://youtu.be/dn2Qdrz9JDo>

More Gaia Sky videos can
be found on
<https://t1p.de/nyyu>



If you want to view the newest Gaia videos, subscribe to our **YouTube channels**

Stefan Jordan: <https://www.youtube.com/channel/UCaQGWvf5PvJ-AMj>



Gaia Sky/Toni Sagristà: <https://www.youtube.com/user/toninoni>



Follow Stefan Jordan on Twitter: <https://twitter.com/StefanJordanARI>

(Unpaid) Offer

- We do not have anyone to manage DPAC Gaia Outreach for Schools
- Is there anyone interested to manage this, alone or in a small team?
- Of course there would be (non-financial) support by the outreach team .
- If you are interested, please write an Email to
 - Stefan Jordan (jordan@ari.uni-heidelberg) and
 - Eduard Masana (emasana@fqa.ub.edu).