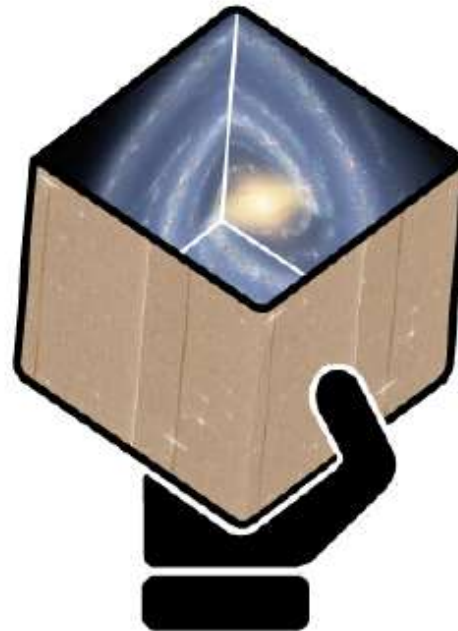


SOBRE LA PRIMERA Y SEGUNDA PUBLICACIÓN DE DATOS

(based on a presentation by A. Brown)



<http://www.cosmos.esa.int/web/gaia/release>

- **1st release (summer 2016):** (α, δ, G) for all well-behaved sources, variable, TGAS $(\alpha, \delta, G, \mu, \pi)$
- **2nd release (end 2017):** $(\alpha, \delta, G, \mu, \pi, G_{BP}, G_{RP}, v_{rad})$ for all well-behaved sources
- **3rd release (2018):** Binary orbits, Classification + astrophysical parameters
- **4th release (2019):** Variable classification + epoch photometry, Solar system, Non-single star catalogue.
- **Final release (2022):** Full astrometric, photometric and radial-velocity catalogues, variable stars, non-single, classifications, astrophysical parameters, exoplanet list, epoch data for all sources, ground-based observations for data-processing.

Astrometry

α , δ for all sources (> 1 billion)

ϖ , μ_{α^*} , μ_{δ} for TGAS sources (~ 2 million)

Covariance matrices (standard errors and correlations)

→ formal errors ‘inflated’ to realistic values

Statistical information to judge astrometry quality

Photometry

Mean G -band fluxes and errors for all sources

G magnitudes in VEGAMAG system

Photometric zero-points for VEGAMAG and AB

No pass-band calibration, transformation to other systems will be provided

Statistical information to judge photometry quality

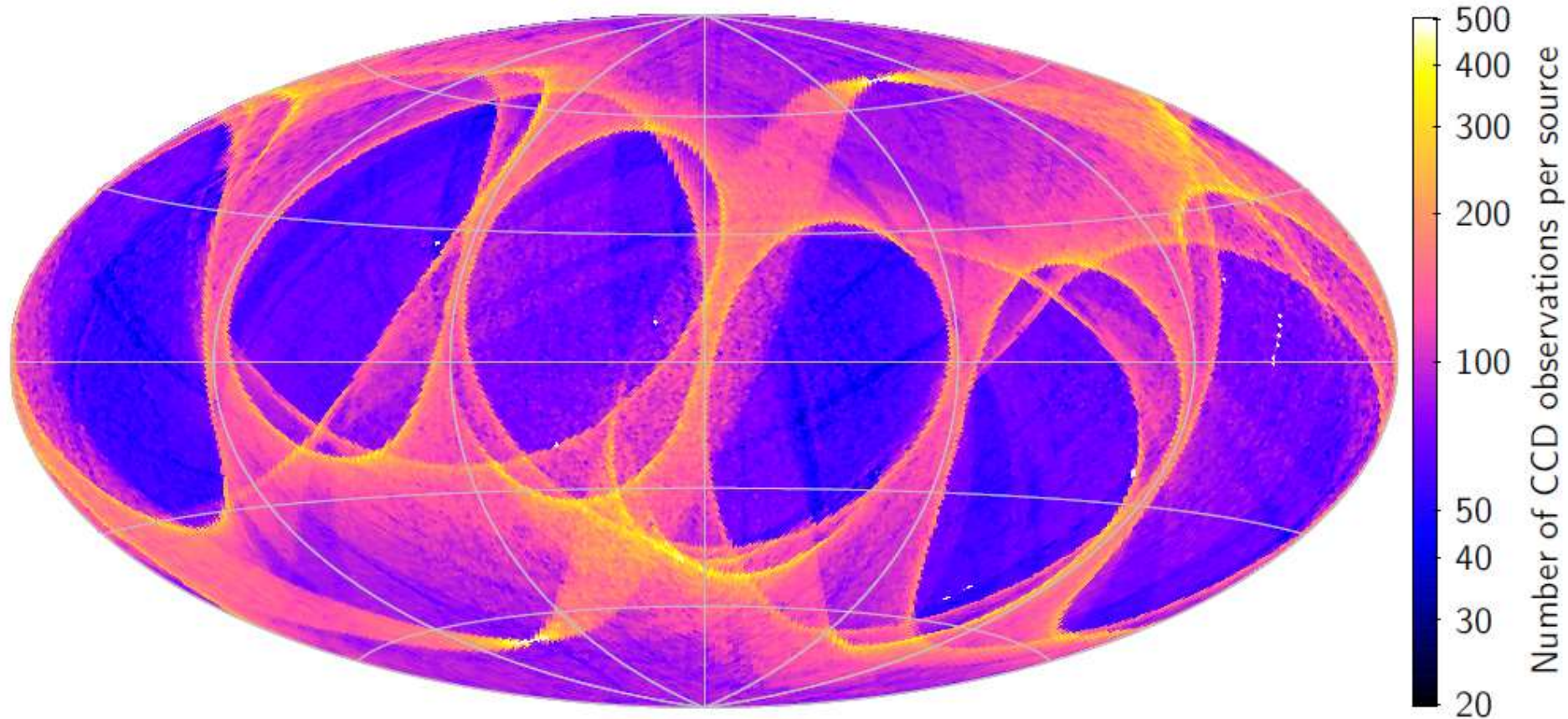
Variable star data

G -band light curves for selected RR-Lyrae and Cepheids

Classification information for these variables

Statistical information on G -band time series

- ◆ Gaia-DR1 results will be immensely valuable
 - ▶ most accurate sky-map to date at HST-like resolution
 - ▶ large increase in parallax information
 - ▶ much more accurate proper motions for Hipparcos stars
- ◆ Experience from scientific use of the data will benefit future improvements of the Gaia data processing



General

- 14 months of input data used
- $\sim 2.3 \times 10^{10}$ transits across focal plane
- all sources treated as single
- preliminary validation of astrometry and photometry completed

Astrometric processing

- ◆ Finished, results in main data base at ESAC
- ◆ positions for > 1 billion sources ($m \lesssim 20$)
- ◆ parallax and proper motion for 2 million Hipparcos and Tycho-2 stars ($m \lesssim 11.5$)
- ◆ reference frame aligned to ICRS, astrometry at epoch J2015.0
- ◆ basic angle variation correction derived from on-board metrology

Photometric processing

- Finished, results in main data base at ESAC
- mean G -band magnitudes for all sources
- Light-curves for selected RR-Lyrae and Cepheids, mainly around ecliptic poles
 - ▶ Light-curve processing (classification and characterization) finished, data to be integrated into MDB

Gaia-DR1: next steps

1. Integrate processing results into main data base (done)
2. Final validation of the results by independent DPAC team (CU9, ongoing)
3. Agreement by Gaia Science Team and DPAC Executive on Gaia-DR1 contents
 - ▶ **contents of Gaia-DR1 subject to validation and GST/DPACE approval**
4. Prepare documentation (ongoing)
 - ▶ including Gaia-DR1 papers for A&A edition
5. Provide details on data model and statistical information on contents
6. Open the Gaia archive (end of summer 2016)
7. Go crazy with the data...

Filtering before release




- Contents of Gaia-DR1 are not a 1-to-1 copy of main data base contents
- Filtering of results will be done based on validation at the AGIS, PhotPipe and VariPipe level, and at global level (CU9)
- YOUR FAVOURITE SOURCE(S) MAY THUS NOT APPEAR IN Gaia-DR1

Examples

- ◆ Omit sources with too few observations
- ◆ Omit sources without astrometry and/or photometry
- ◆ Upper limit on errors in parallax, position, photometry
- ◆ Omit sources suffering from specific problems in the data processing (e.g., data gaps)
- ◆ No high proper motion stars ($\mu > 3.5 \text{ arcsec yr}^{-1}$) due to technical issue
- ◆ ...



- Online archive @ ESDC (ESAC Science Data Centre)
 - ▶ catalogue mirrored at CDS, ASDC, ARI, AIP, as well as STScI, USNO, NAOJ, SAAO, ObsPM
 - ▶ these data centres may layer their own services on top of Gaia catalogue
- Online (interactive) and offline documentation
 - ▶ archive contents and the meaning of the tables
 - ▶ how was the processing done
 - ▶ how were the results validated
 - ▶ A&A papers providing ‘condensed documentation’
 - ▶ science verification papers on open clusters and Cepheids
- Query tools for the archive (ADQL, TAP)
- Visualization tools
 - ▶ pre-computed views of large data sets
 - ▶ web-client with linked views, option to visually generate catalogue queries
- Pre-computed and validated cross-match with:
 - ▶ Hipparcos-2, Tycho-2, 2MASS PSC, GSC2.3, PPMXL, UCAC4, SDSS DR10/DR12, AllWISE, URAT-1, RAVE

http://gaia.esac.esa.int/archive/

→ EUROPEAN SPACE AGENCY  ABOUT ESAC  SIGN IN 

gaia archive

HOMESEARCHSTATISTICSVISUALIZATIONHELPDOCUMENTATION




Welcome to the Gaia Archive Core Systems interface


DISCLAIMER: This archive is currently in **prototype status** and provides **simulated Gaia data**.

Gaia is an ambitious mission to chart a three-dimensional map of our Galaxy, the Milky Way, in the process revealing the composition, formation and evolution of the Galaxy. Gaia will provide unprecedented positional and radial velocity measurements with the accuracies needed to produce a stereoscopic and kinematic census of about one billion stars in our Galaxy and throughout the Local Group. This amounts to about 1 per cent of the Galactic stellar population.

The GACS (Gaia Archive Core Systems) are a set of subsystems developed for the Gaia project by the ESAC Science Data Centre that allows to search, download and explore the Gaia data



Top Features




Search

Query for Gaia sources using an ADQL (Astronomical Data Query Language) interface in an asynchronous mode (UWS).




Statistics


Show statistics of Gaia tables.



Help

For questions, suggestions or problem reports, contact the Helpdesk.





Documents

Links to GACS and related Gaia documentation.

COPYRIGHT 2000 - 2016 © EUROPEAN SPACE AGENCY. ALL RIGHTS RESERVED. (v0.7)

http://gaia.esac.esa.int/archive/

→ EUROPEAN SPACE AGENCY ABOUT ESAC SIGN IN

gaia archive

HOME SEARCH STATISTICS VISUALIZATION HELP DOCUMENTATION

Simple Form ADQL Form Query Results

Position File

Name
 Equatorial

Target in Circle Box

Name for Radius

Search in: Gaia Source Tycho-Gaia Astrometric Solution (TGAS)

▶ Extra conditions

▶ Display columns

Max. number of results:

[Reset Form](#) [Show Query](#) [Submit Query](#)

SEE THIS AFTERNOON'S SESSION

- Planned for autumn 2017
 - ▶ DPAC schedule under heavy revision
- Astrometry and photometry based on roughly 22 months of data
 - ▶ Gaia stand-alone astrometric solution (unlike TGAS, no priors needed)
 - ▶ 5-parameter astrometry for all sources
- Broad band colours ($G_{\text{BP}} - G_{\text{RP}}$)
 - ▶ improved photometric calibrations
 - ▶ proper pass-band calibrations
- Median radial velocities for bright ($G_{\text{RVS}} < 12$) stars
- More variable star results
 - ▶ Cepheids, RR Lyrae all sky, LPV, short time scale variables, exercise exo-planet transit algorithms, QSO variability
- Astrophysical parameters
 - ▶ attempt determination T_{eff} and A_0 from ($G_{\text{BP}} - G_{\text{RP}}$) or publish relation between T_{eff} and ($G_{\text{BP}} - G_{\text{RP}}$)
 - ▶ from BP/RP spectra: T_{eff} , A_0 , $[\text{Fe}/\text{H}]$, $\log g$ ($[\text{Fe}/\text{H}]$, $\log g$ only for brighter stars)
 - ▶ for TGAS stars release M_G
 - ▶ attempt radius and luminosity determination for TGAS sources

THANK YOU