



The Spanish Network for Gaia Science Exploitation

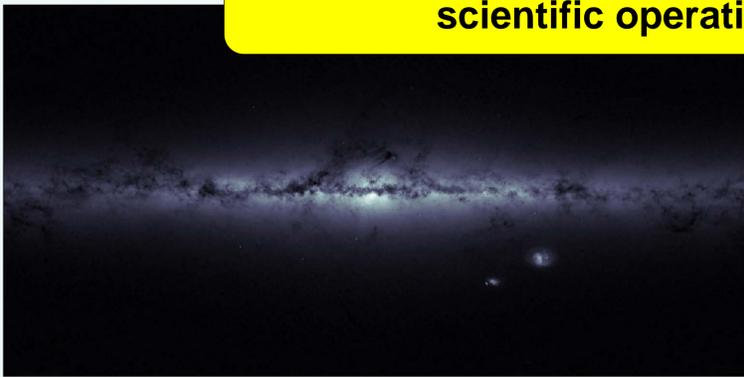
F. Figueras y C. Jordi, X. Luri and J. Torra on behalf of the REG Executive Committee and Gaia-UB team

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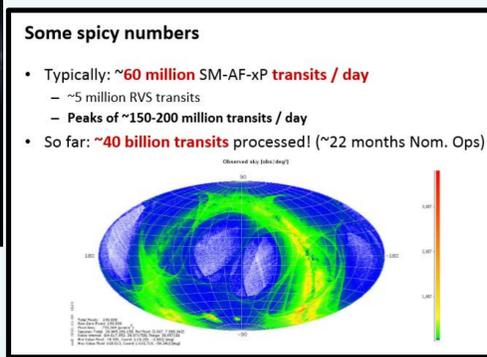
The "Red Española de Explotación Científica de Gaia" (REG) continues to intensify its activities facing the imminent publication of the first and second Gaia Data Releases (14 September, 2016 and Q4-2017, respectively). The network, supported by the MINECO under contract "Acciones de dinamización, Redes de Excelencia (2016-2017)", has as major priority the task to coordinate and support the collective activities developed by its more than 150 members.

At present, REG plays a prominent role in the preparation of the Spanish community for the use of the Gaia Data Archive (a task lead by the Spanish teams), in the work to exploit the Gaia-ESO Survey collected during the last four years and in supporting the preparation of the Science Case and Survey Plan for WEAVE, the new multi-object spectrograph for the WHT at Canary Islands (commissioning, 2018). These activities will be described together with the schedule of future national and international science meetings and the outreach activities being organized for the First and Second Data Releases.

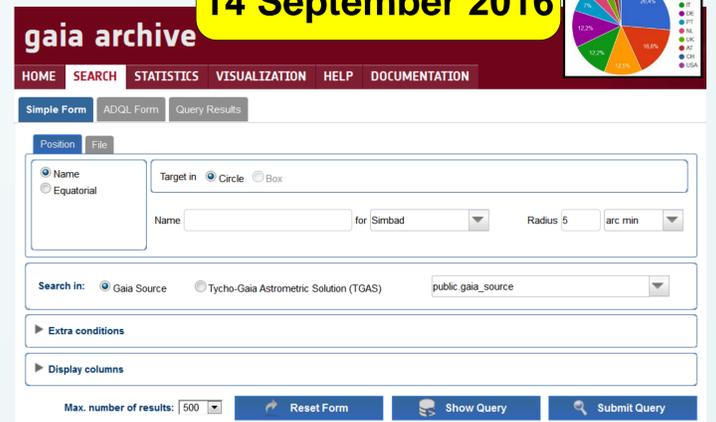
Gaia, more than 2 years of successful scientific operations



This image is based on Gaia housekeeping data. They include the total number of stars, used in the attitude-control loop, that is detected every second in each of Gaia's fields of view. Image shows density of stars across the sky from this housekeeping data.



Ready for 14 September 2016



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

REG Activities

For a full description of the ongoing work inside REG, see slides in the last REG meeting, 23-25 may 2016

Ongoing Spectroscopic and photometric Surveys, few examples:

Gaia ESO Spectroscopic Survey (GES)

For the stars that will be observed in the Gaia ESO Spectroscopic Survey (GES) with VLT-FLAMES, UVES and Giraffe

- Stellar atmospheric parameters (T_{eff} , $\log g$, ξ and $[\text{Fe}/\text{H}]$)
- Abundance determination
- Different tests with UVES archive spectra already started: *Edwards, 2014; Gillet, 2014; Soubiran, et al., 2014; A.A., 2014, 1225*
- See also "Testing the chemical tagging technique with open clusters" (Barco-Guarnido et al., 2015, A.A., 372, A.70)

→ Combined Gaia and homogeneous spectroscopic dataset fill 4D phase space (R, V, Z, V_z), plus stellar parameters, and chemistry for a very large number and variety of stars down to the 19 mag: see science plus legacy science

D. Montes et al.

The GALANTE survey

- Northern Galactic Plane
- ~2 nights/month in the T80
- Exposure times from 0.1 to 50 s
- Saturation ~ mag 6
- SNR ~ 100 at mag 17
- Seven filters:
 - F348M + F420N + F450N
 - F515N + F616M
 - F660N + F665N

Aims and observational strategy

- Obtain accurate v_r and chemical abundances for more than 20 chemical species from high-resolution spectroscopy of Northern GCs
- Observational strategy:
 - Selection of 20 GCs older than 0.3 Gyr (limiting magnitude $V \sim 15$)
 - Sample as large as that Clump stars per cluster
 - SNR ~ 70
- Observational facilities:

Instrument	Diameter	Spectral range	Resolution
UVES	8.2 m	3700 - 7800 Å	~45,000
Melisse/FLAMES	3.6 m	3700 - 8000 Å	~45,000
FLAMES/GIRAFFE	3.2 m	3900 - 8000 Å	~45,000

Ongoing work to prepare tools and statistical methods for Gaia data analysis

El entorno VO y cómo buscar datos complementarios a TGAS

Enrique Solano

¿Qué es Clusterix?

<http://clusterix.cerit-sc.cz/>

Orbit computation in realistic galactic potentials

Gaia + WEAVE

Gaia (end-of-mission) and WEAVE accuracies for the 6D (r, v) parameters 1 Gyr back on time integration of an K1II (or early A)V star

(X) = (30.5, 0) kpc, Perseus arm, AC (X) = (4.5, -1.0) kpc, Sagittarius arm, inner

MW potential (Domero-Gómez et al., 2015)

REG participation in future photometric and spectroscopic surveys, some examples being:

Large Surveys in the next decade

High precision **Astrometry** (+ phot + Spectro)

Gaia (G < 20) (2014-2022)

LSST (+4 mag) (SH, 2022-)

RV + abundances
Large spectroscopic surveys

APOGEE
Gaia-ESO
LAMOST
SEGUE
HERMES
EMIR
WEAVE
4MOST
...

Gaia+ (ready, 2022)

A complex system

EMIR

Plan to first light

- Just got the ATS from GRANTECAN
- Shipped on May 19
- Now at the GTC clean room
- 3 stages commissioning (+ SciVerPh - TBD)
- Com1 starting on June, 13.
- Tentatively, 1st call in shared-risk mode by Sept-Oct, 16
- EMIR is as complicated as it is powerful

WEAVE@ WHT, a MOS in the optical

Parameter	Value
Telescope, diameter	WHT, 4.2m
Field of view	2°
Number of fibers	3000
Fiber size	1.3" (goal 1.4")
Number of small IFUs, size	25, 9" x 9" (1.3" spaxels)
LIFU size	1.5" x 1.3" (2.6" spaxels)
Low-resolution mode resolution	4300-7200
Low-resolution mode wavelength coverage (Å)	3660-9840
High-resolution mode resolution	2856-23375
High-resolution mode wavelength coverage (Å)	4040-6850, 4730-5450, 5950-6850

Radial velocities ± 2 km/s $V=20$
Abundances $V \leq 17$

REG team is actively working on WEAVE Science Case and Survey Plan documents (commissioning is expected for 2018). REG participates in Stellar, Circumstellar, and Interstellar Physics Survey (SCIP); Galactic dynamics, Halo, Open clusters

WEAVE SCIP meeting, 8-9 march 2016, BCN

REG community participating in the European Gaia GREAT Network

The Gaia Research for European Astronomy Training (GREAT) network is a pan European science driven research infrastructure, which is facilitating, through focused interaction on a European scale, the fullest exploitation of the ESA Gaia 'cornerstone' astronomy mission.

Next meetings (see web):

GaiaChallenge IV, 10-14 October 2016, Nordita, Stockholm, "The aim of the Gaia Challenge is to prepare and discuss the exploitation of Gaia data, galactic dynamics"

Gaia Spring New York City, October 17-21, 2016

Gaia DPAC Consortium Meeting (~250 participants), Sitges, 23 - 27 January 2017

IAUS 330: Astrometry and Astrophysics in the Gaia Sky, Nice, April 24-28, 2017