GENIUS

Technical Overview

gaia

Gaia DPAC
Data Processing & Analysis Consortium

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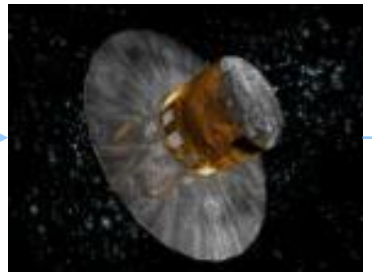
Universitat de Barcelona

GENIUS Statement of work

*GENIUS is **designed to boost the impact** of the next European breakthrough in astrophysics, the Gaia astrometric mission.*

*GENIUS is aimed at **significantly contributing to the development of this archive** based on the following principles: archive design driven by the needs of the user community that will scientifically exploit the Gaia results; provision of exploitation tools to maximize the scientific return; ensuring the quality of the archive contents and the interoperability with existing and future astronomical archives; cooperation with the only other two astrometric missions in the world, Nano-JASMINE and JASMINE (Japan); and last but not least, the archive facilitates outreach activities.*

Industry/ESA CSG/ESOC

(2013)

One consortium: the DPAC

The final responsibility of the mission is in the hands of ESA

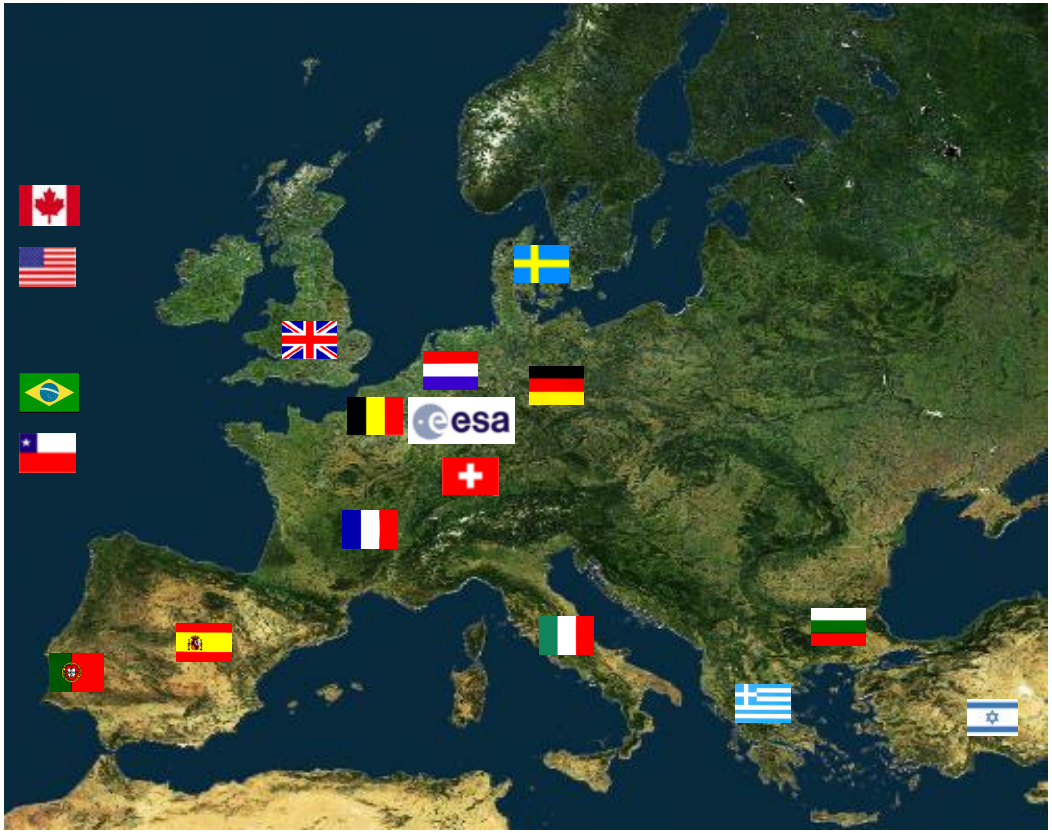

Data reduction is a responsibility of the scientific community, funded by the member states

← GENIUS

Data Processing and Analysis Consortium

- Formed to answer the Announcement of Opportunity (AO) for Gaia data processing
- Involves large number of European institutes and observatories (~450 people, >20 institutes)
- The science community must fund the majority of the Gaia processing (not ESA)

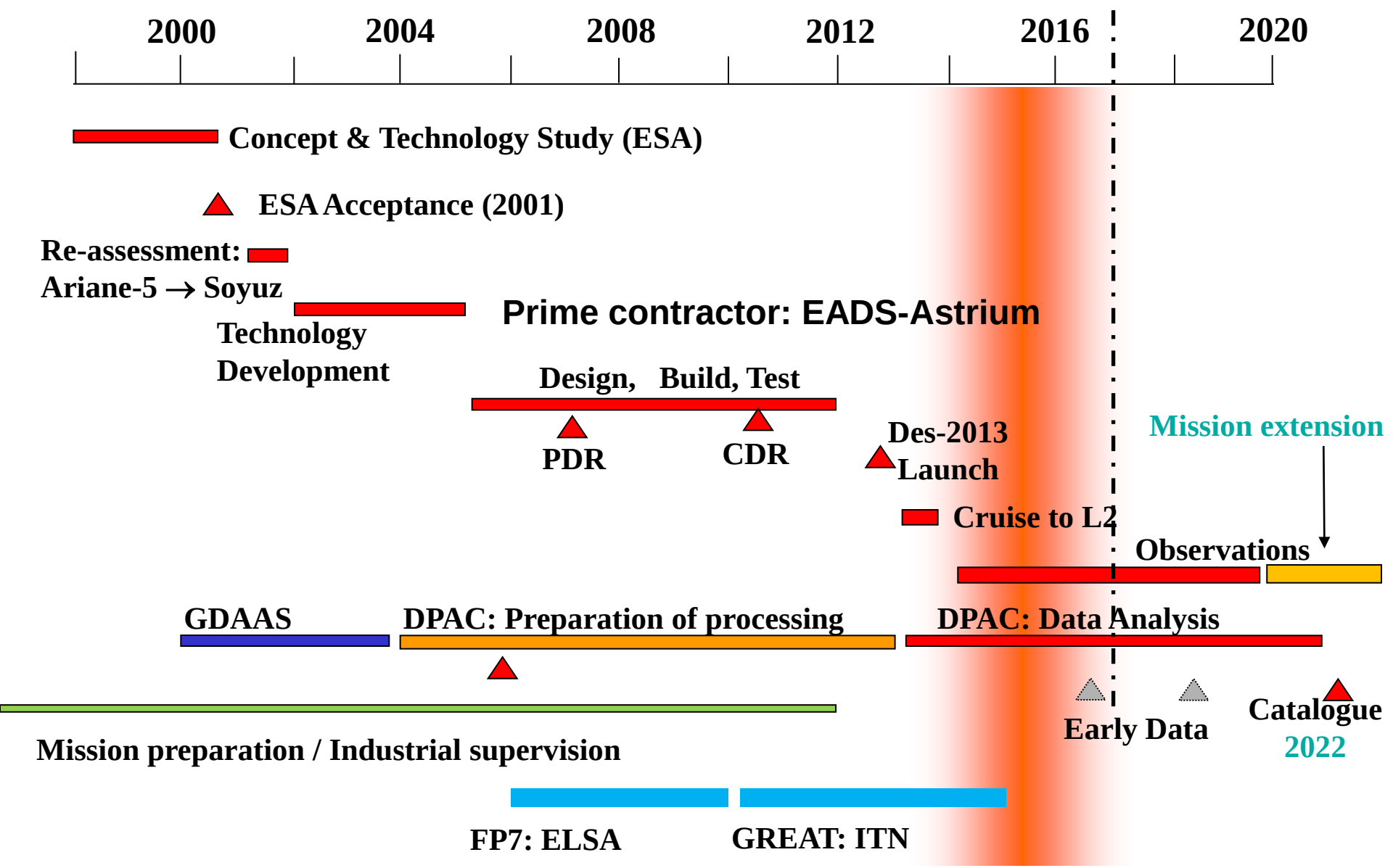
- ~450 members
- 24 Funding Agencies
- 93% in the 10 largest



- With a 5 years mission, ~33% of DPAC cost will be dedicated to Operations

MLA duration:	2007-2022
FTEs/year up to 2011:	270
Average yearly cost:	~30Meuros
Global cost:	~500M€

GENIUS in the overall picture



CU9

The CU9 is in charge of designing, implementing and operating the Gaia archive. It is responsible of actually making the Gaia data available to the scientific community

The first archive prototype was available in June 2014

An FP7 project (GENIUS) has been granted to ICCUB to work on the archive (end March-2017)

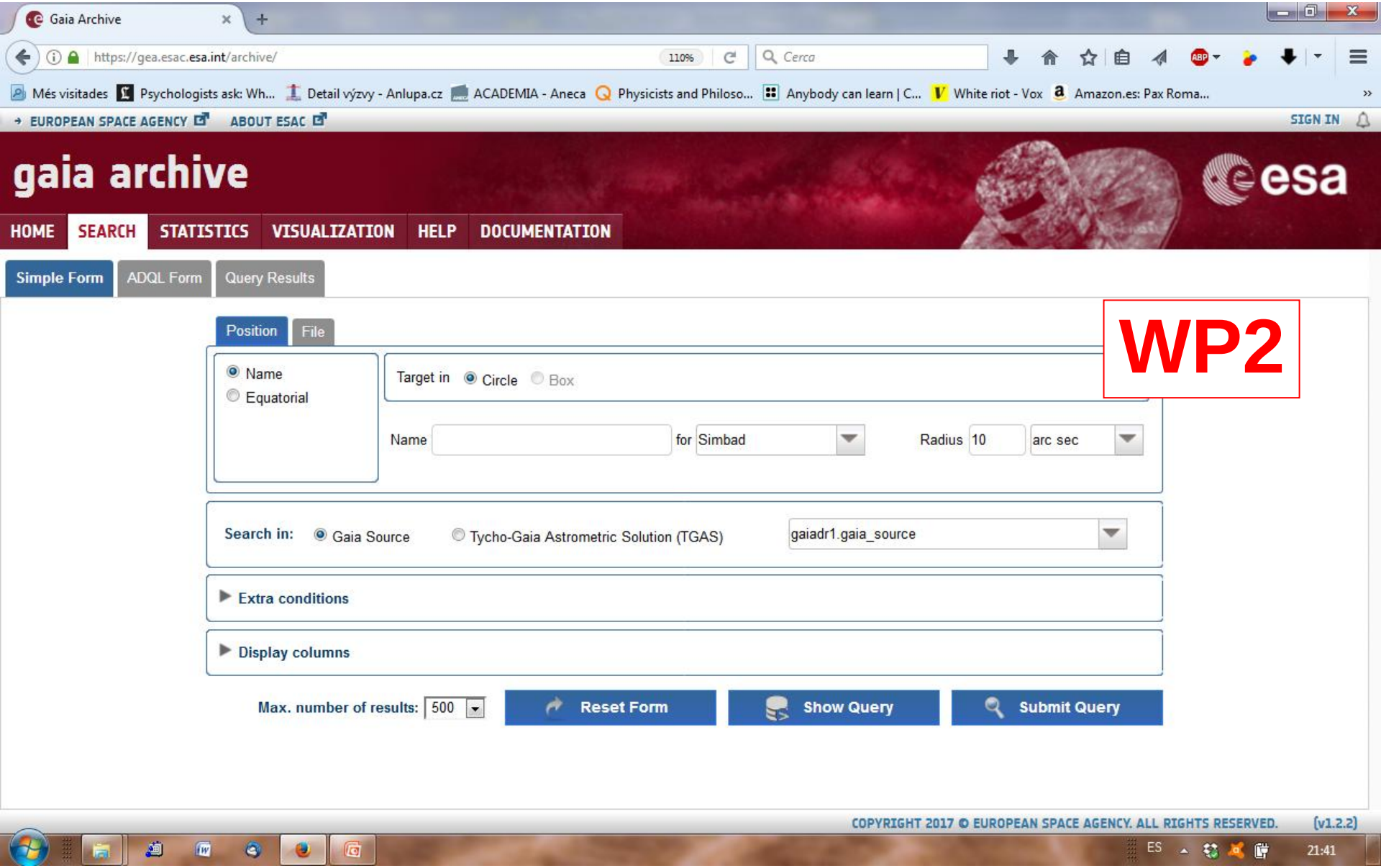
CU9 work areas

- Documentation
- Archive architecture
- Validation
- Operations
- Education and outreach
- Science enabling applications
- Visualization

CU9 work areas
Areas of GENIUS contributions

- **Documentation**
- **Archive architecture**
- **Validation**
- **Operations**
- **Education and outreach**
- **Science enabling applications**
- **Visualization**

The archive: https://gea.esac.esa.int/archive/



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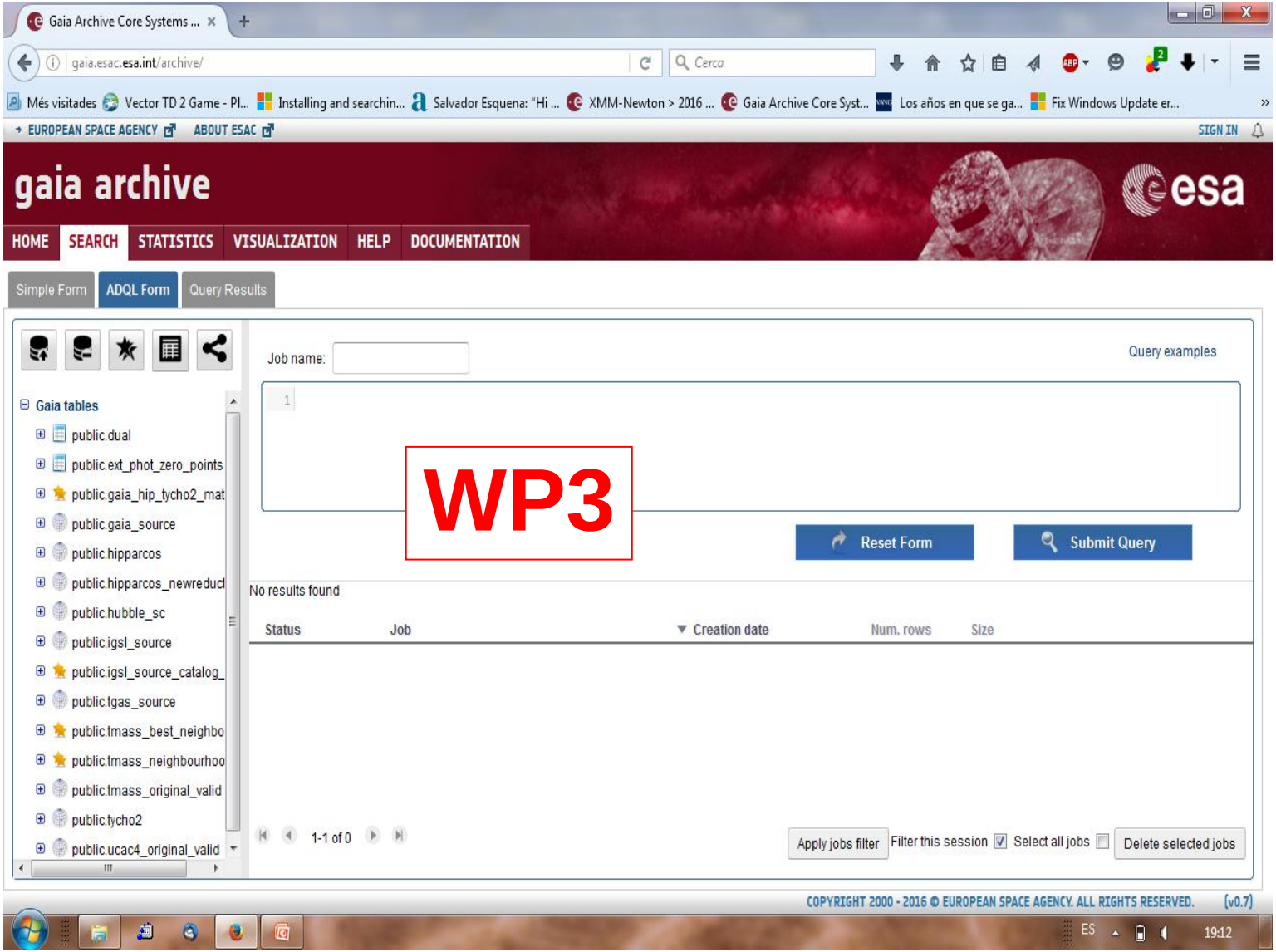
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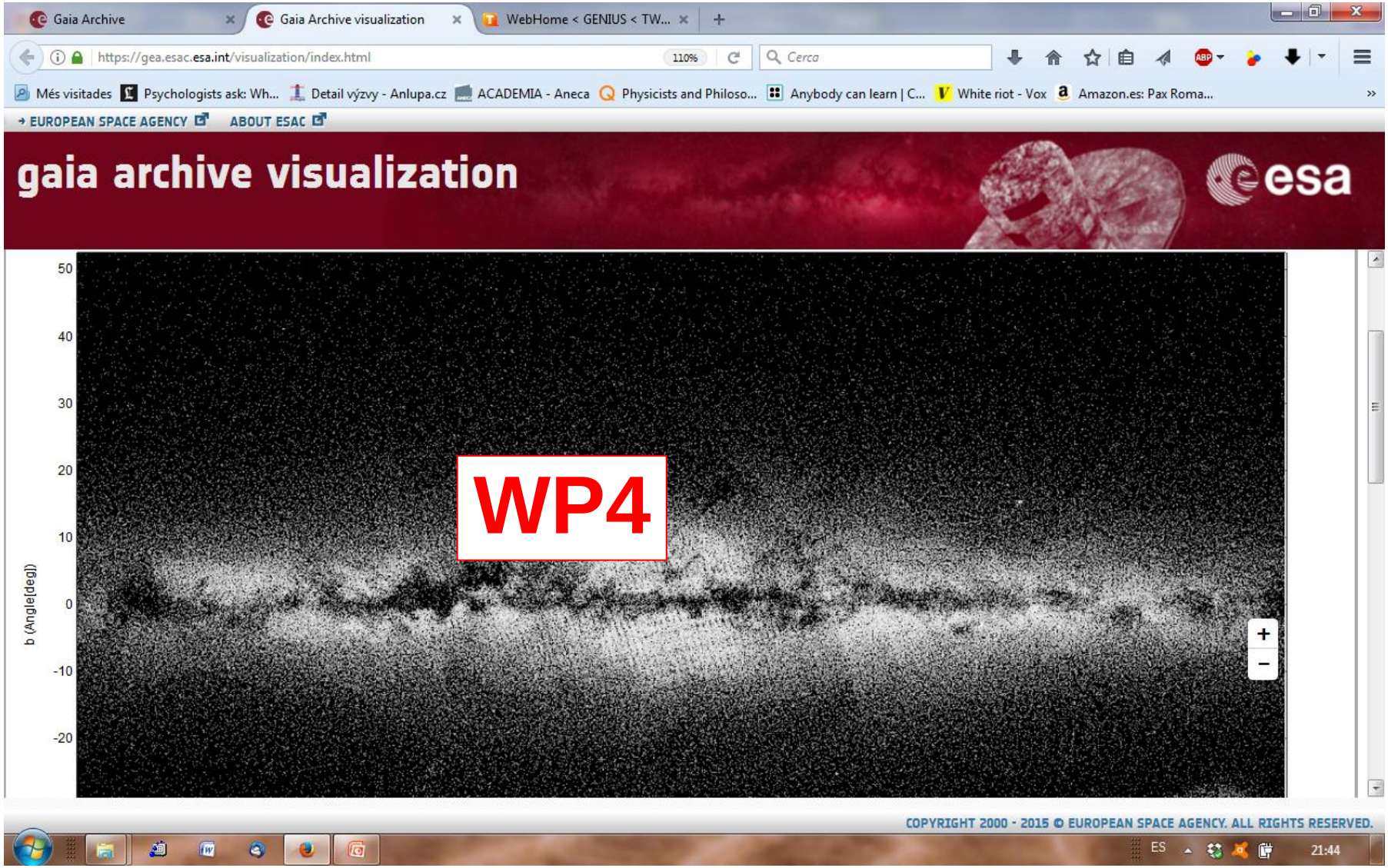
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WP4
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WP4

⊙ Clusterix 2.0 ⊙

***Clusterix** 2.0 is an interactive web-based application to calculate the grouping probability of a list of objects using proper motions and the non parametric method described in Galadi-Enriquez et al. 1998. It also allows the possibility of gathering physical parameters (parallaxes, radial velocities, proper motions,...) from Vizier and estimating effective temperatures, surface gravities and metallicities using VOSA.*

Step 1/3: Information gathering (coordinates and physical parameters)

Search by Id
Usage: ID
Radius arcmin
Catalogue GAIA/DR1

Search by Coordinates
Usage: RAJ2000(deg),DEJ2000(deg)
Radius arcmin
Catalogue GAIA/DR1

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Search by file?
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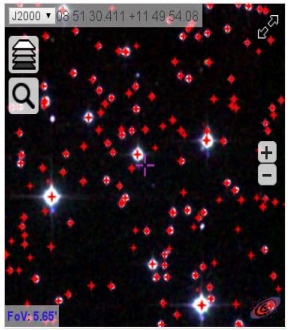
Membership from proper motions



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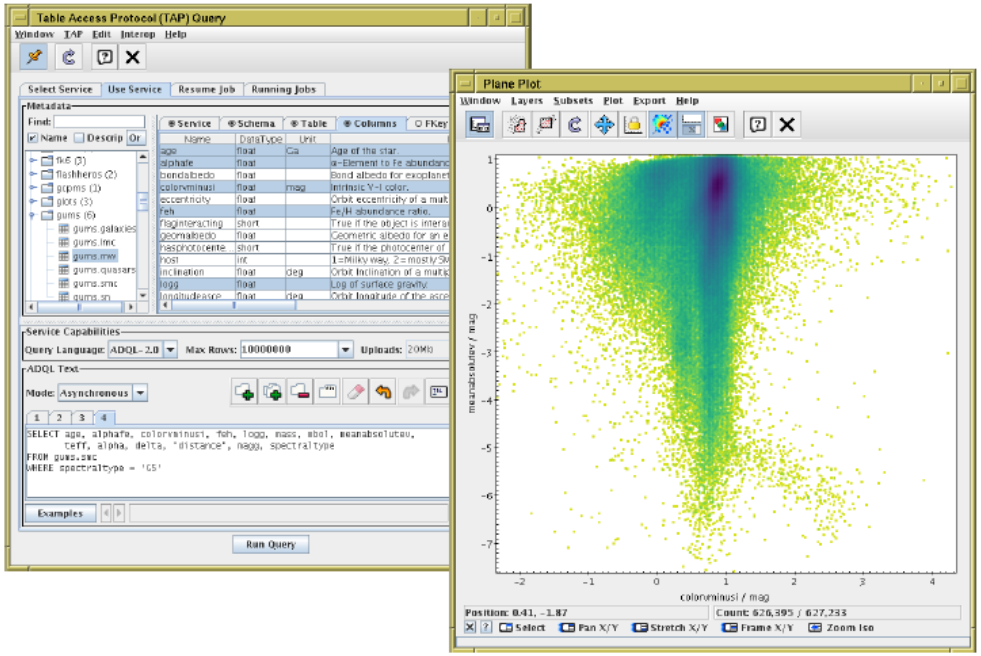
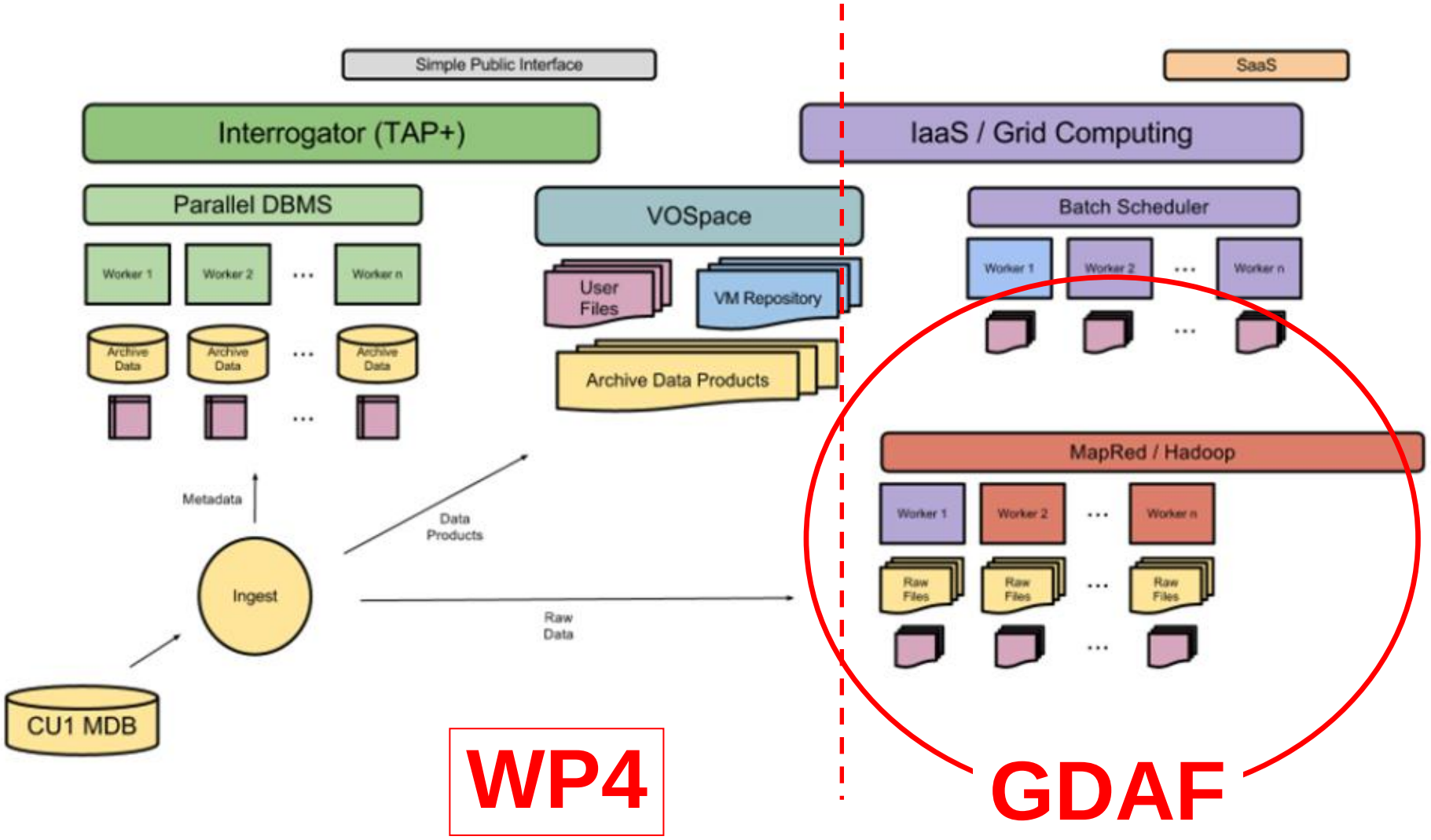
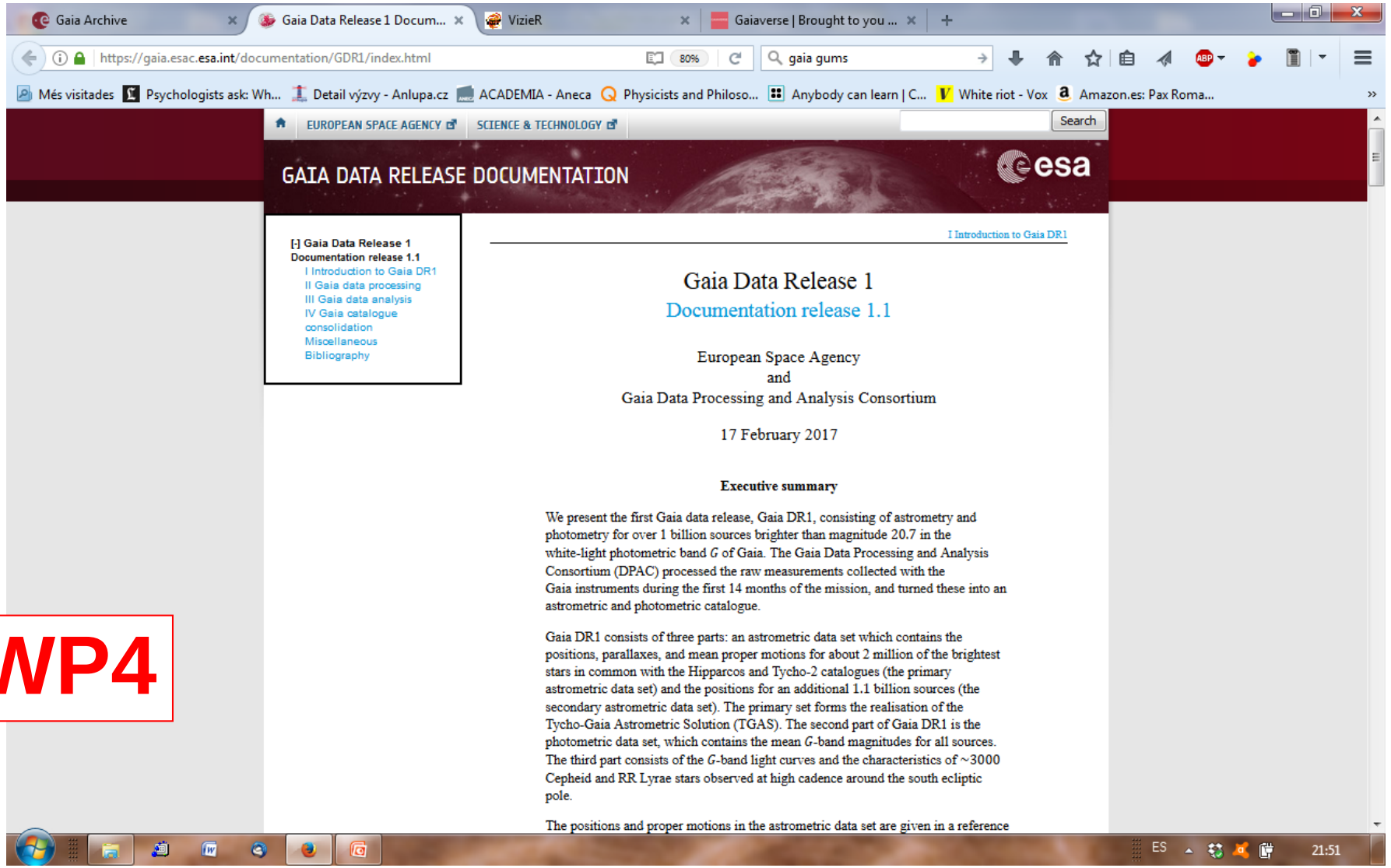


Archive architecture at SOC

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Documentation release 1.1
I Introduction to Gaia DR1
II Gaia data processing
III Gaia data analysis
IV Gaia catalogue consolidation
Miscellaneous
Bibliography
I Introduction to Gaia DR1
Gaia Data Release 1
Documentation release 1.1
European Space Agency
and
Gaia Data Processing and Analysis Consortium
17 February 2017
Executive summary
We present the first Gaia data release, Gaia DR1, consisting of astrometry and photometry for over 1 billion sources brighter than magnitude 20.7 in the white-light photometric band G of Gaia. The Gaia Data Processing and Analysis Consortium (DPAC) processed the raw measurements collected with the Gaia instruments during the first 14 months of the mission, and turned these into an astrometric and photometric catalogue.
Gaia DR1 consists of three parts: an astrometric data set which contains the positions, parallaxes, and mean proper motions for about 2 million of the brightest stars in common with the Hipparcos and Tycho-2 catalogues (the primary astrometric data set) and the positions for an additional 1.1 billion sources (the secondary astrometric data set). The primary set forms the realisation of the Tycho-Gaia Astrometric Solution (TGAS). The second part of Gaia DR1 is the photometric data set, which contains the mean G-band magnitudes for all sources. The third part consists of the G-band light curves and the characteristics of ~3000 Cepheid and RR Lyrae stars observed at high cadence around the south ecliptic pole.
The positions and proper motions in the astrometric data set are given in a reference
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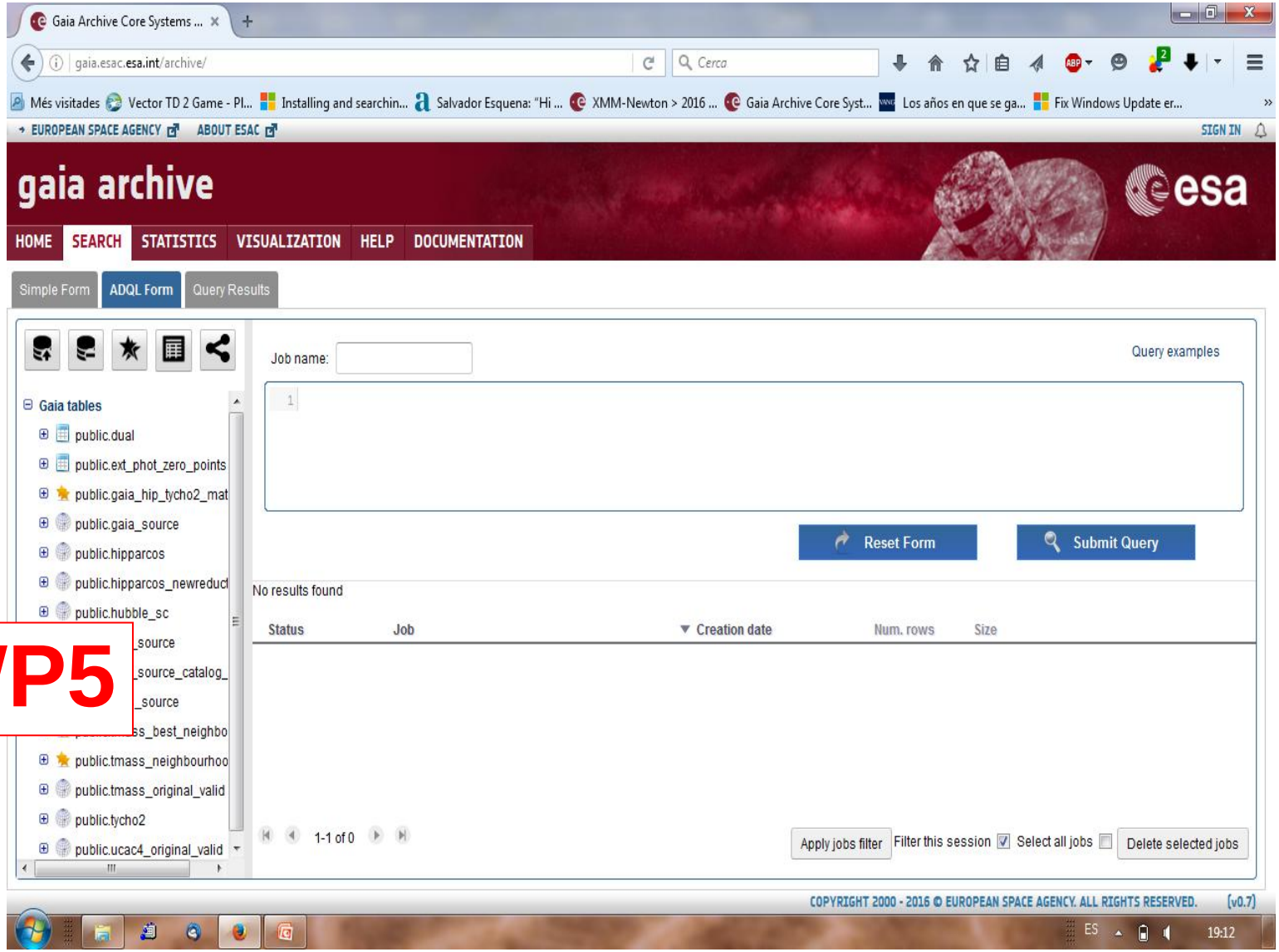
WP4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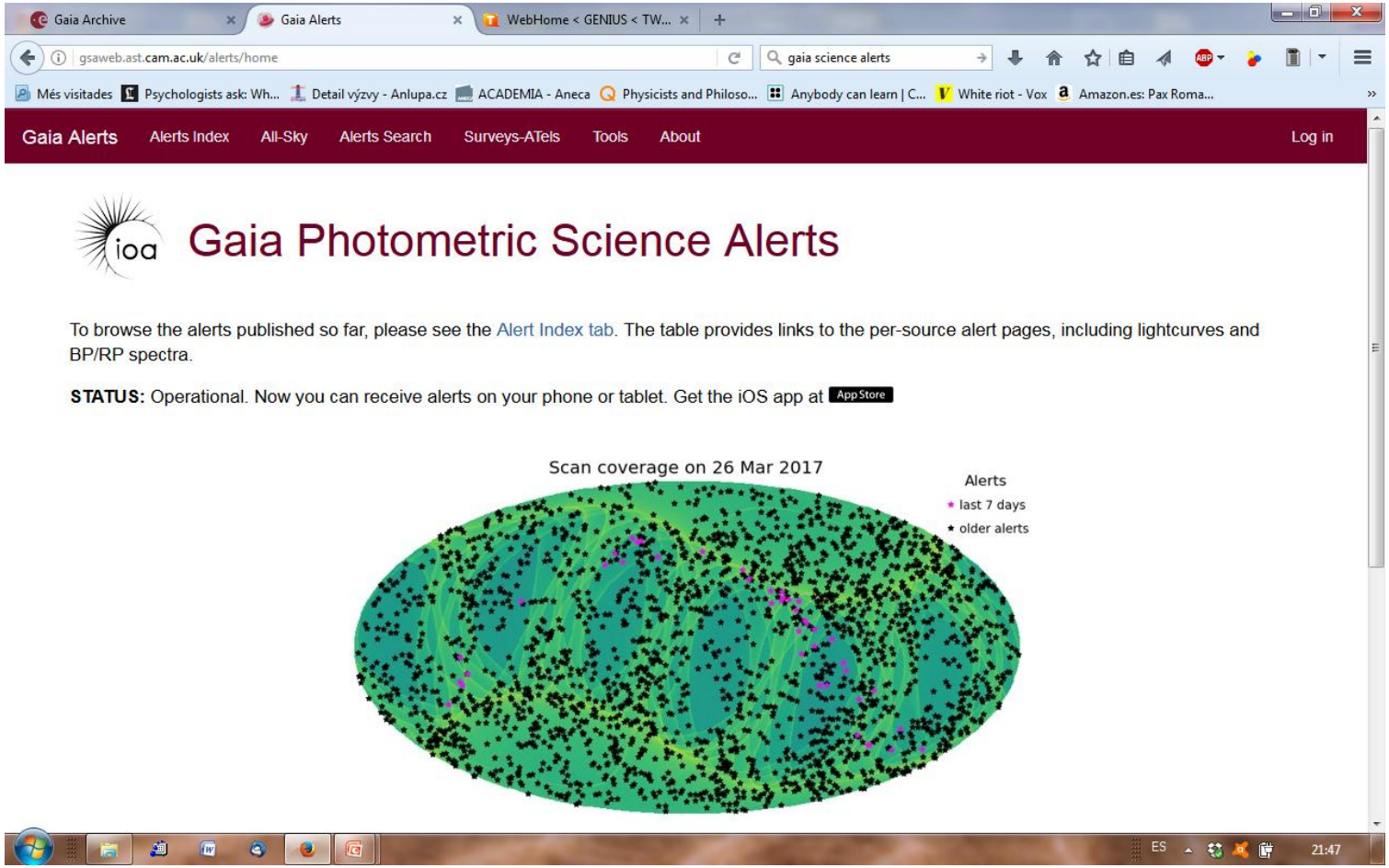
WP5

WP6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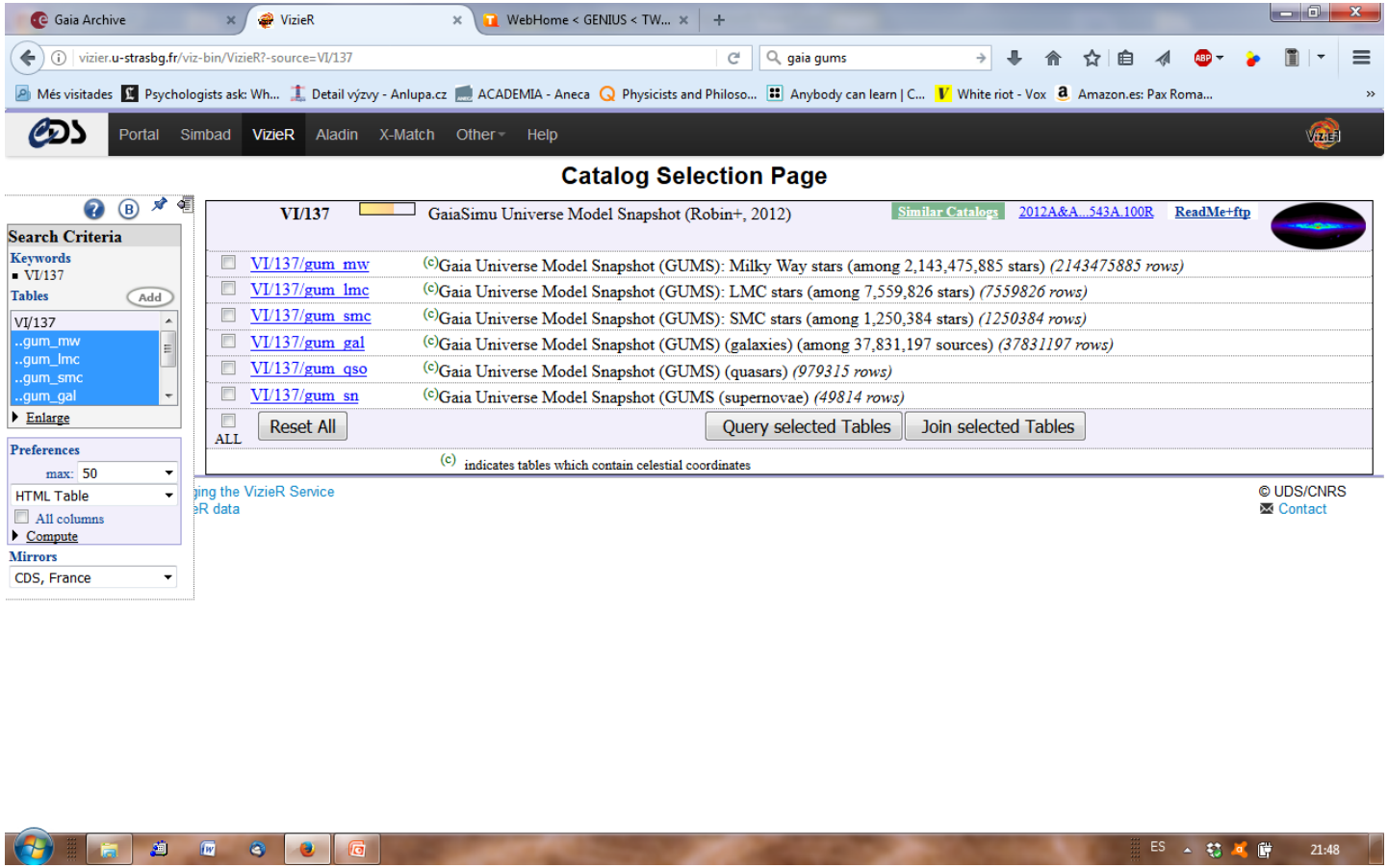
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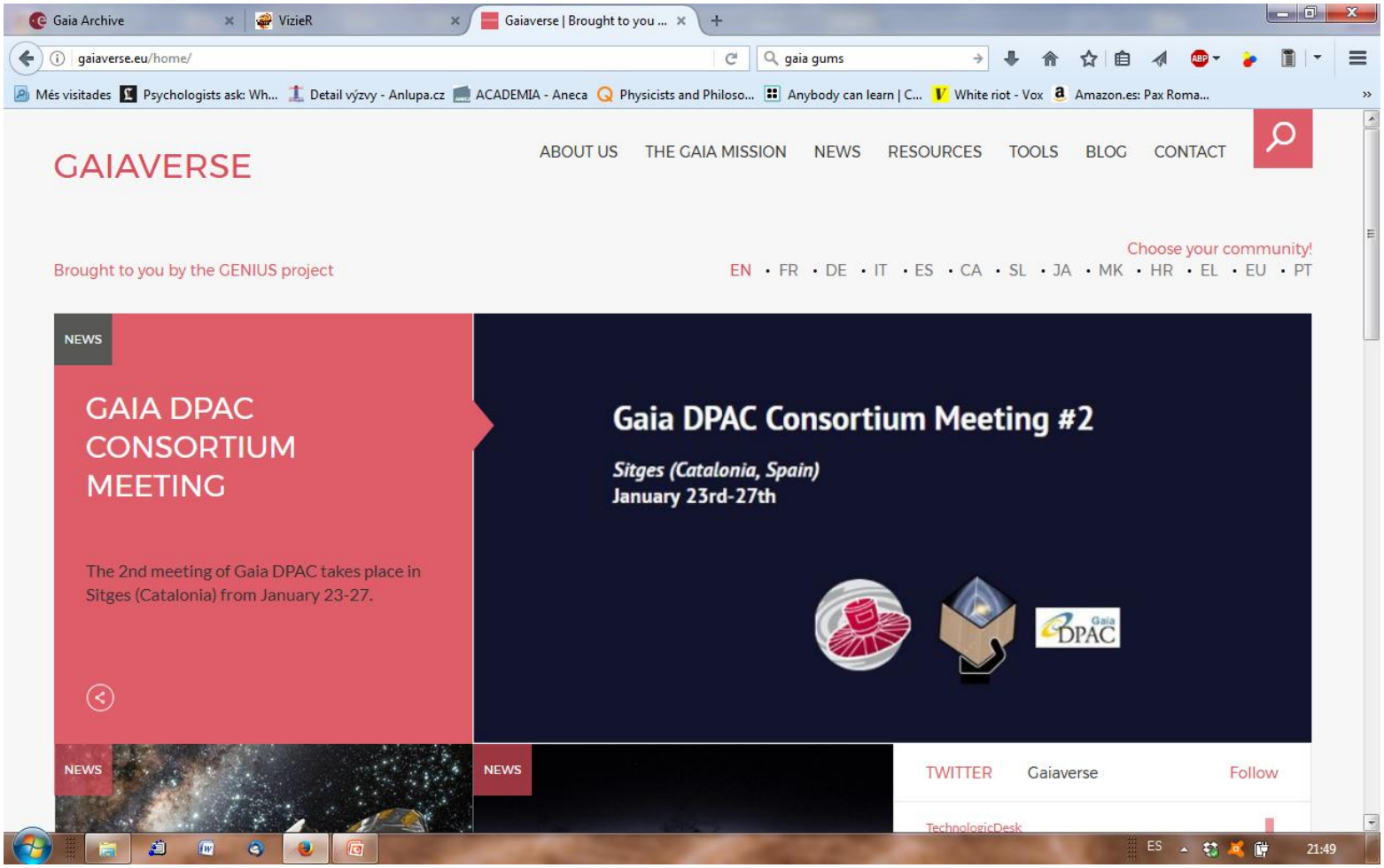
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NEWS
GAIA DPAC CONSORTIUM MEETING
The 2nd meeting of Gaia DPAC takes place in Sitges (Catalonia) from January 23-27.
Gaia DPAC Consortium Meeting #2
Sitges (Catalonia, Spain)
January 23rd-27th
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Summary:

after three years of work GENIUS has made a relevant contribution to Gaia and its archive