

DRACO – The Italian Datagrid for Research in Astrophysics and Coordination with the Virtual Observatory

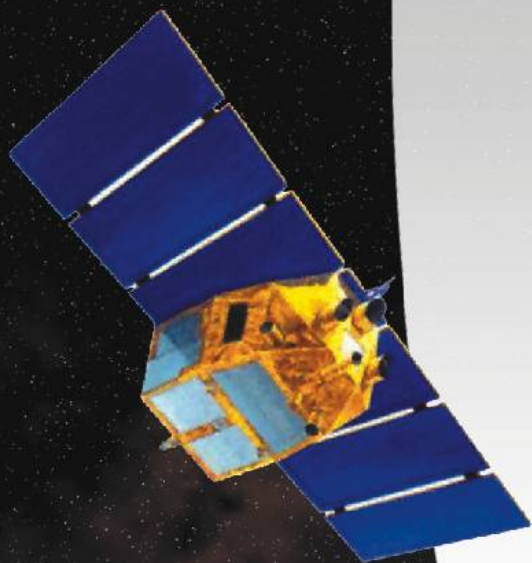
prepared by Fabio PASIAN

The Italian Datagrid for Research in Astrophysics and Coordination with the Virtual Observatory (DRACO) will provide the scientific community with a distributed multifunctional environment enabling the use of specialized (observational, computing, storage) Grid nodes. DRACO is part of the national cooperation named IG-BIGEST (Italian Grid for Business Industry Government E-Science and Technology): participation in this structure of the astrophysical community is guaranteed by INAF.

The formal project section title for DRACO is “Enabling platforms for high performance computational Grids oriented towards scalable virtual organizations” which has been approved and funded by the Italian Fund for Basic Research (FIRB). The astrophysical section of the project (work-package 10, coordinated by L.Benacchio/OAPd) is the implementation of three demonstrators that are to prove the feasibility of porting astrophysical applications within the framework of a national Grid structure. DRACO provides the framework through which the Italian astrophysical community can participate in the International Virtual Observatory Alliance (IVOA) effort. A reference person (F.Pasian/OATs) has been nominated by INAF as the contact point for VO activities.



The "Galileo" National Telescope (TNG) is 3.58m Alt-Az telescope equipped with an active optics system. Its two Nasmyth foci host 5 instruments that are permanently mounted and operating.



An artistic impression of the Beppo-SAX satellite, a project of the Italian Space Agency (ASI) in association with the Netherlands Agency for Aerospace Programs (NIVR), developed with the support of a consortium of institutes in Italy, The Netherlands and the Space Science Department of ESA (SSD).

The first three DRACO nodes are the INAF Observatories of Naples, Padova and Trieste. Tasks are divided between them as follows:

- Padova and Trieste are to provide access to the prototype TNG Long-Term Archive (LTA) developed as a dedicated pilot project, and to the GSC-II Catalog Consultation System (a web-based application accessing large astronomical catalogs, mainly the GSC 2.2). Maintaining interoperability with other data providers and repositories by co-ordinating with international efforts (OPTICON and IVOA) is a strict requirement.
- Naples is to provide astronomers with effective tools for remote access to the VST/OmegaCAM data reduction pipeline.
- Trieste is also involved in providing a Grid-enabled system allowing transparent access to observing facilities for the monitoring of observations and managing of targets of opportunity.

As an extension of the original core, DRACO intends to participate in the International Virtual Observatory effort. In particular, the Italian community taking part in the development of the Euro-VO project, and expects to contribute on the following topics:

- **Access** to the prototype TNG Long-Term Archive (LTA), located in Trieste, and soon to the full service;
- **Access** to the ASDC archive of high-energy data, located at ASDC (Frascati), and in general to the DIANA system;
- **Access** to a set of distributed radio data (EVN catalogue, Tingo 2MASS archive, ...);
- **Studying** access to small archives and databases;
- **Integration** of other data processing and scientific applications and extending the number of nodes (Observatories of Catania and Rome, Universities of Naples and Salerno) – a proposal for funding has been submitted to the Italian Ministry for Education and Research;
- **Visualisation** using the utilities provided by the Cosmo.Lab project, financed by the European Union as a part of its Fifth Framework Programme, and in particular ASTROMD, a software package for visualisation and analysis enabling 3D graphical representation;
- **"Machine learning"** which encompasses the use of neural networks, genetic algorithms, fuzzy-C sets; the "AstroMining" data mining tool will be used.

<http://wwwas.oat.ts.astro.it/draco/DRACO-home.htm>