Euro-VO
European astronomy

• A rich landscape including the two European Agencies, ESA and ESO, and national programmes

• Several of the founding parents of the astronomical VO

• Challenge: coordinate/federate VO projects
  – Different research/funding systems
  – Different projects
The Euro-VO

• European funding: a complex system which evolves continuously
  – Organized into successive Framework Programmes
  – Calls and « instruments »

• Euro-VO: a series of projects which progressively built the landscape

• Structured in phases in three successive Framework Programmes
  – Phase A (FP5): AVO, OPTICON Interoperability WG
  – Development (FP6): VO-TECH, EuroVO-DCA
  – Transition to operations (FP7): EuroVO-AIDA
In 2002

- **January Strasbourg**
  First Interoperability meeting - VOTable

- **June Garching**
  - Conference *Toward an International Virtual Observatory* (ESO/ESA/NASA/NSF)
  - Creation of IVOA, the Alliance of funded VO projects
Data available at selected point are highlighted in tree.

Field of view outlines are plotted automatically.

Image metadata.
The European vision

Data Centre Alliance
Populates the VO with data and services
FP6 Coordination Action to help data providers and gather feedback

Technology Centre
Distributed
• FP6 VO-TECH Infrastructure Design Study
• ESA-VO (et al.)

Euro-VO
Best effort alliance
8 partners

Facility Centre
Support to users Registry
The European view in FP7

Euro-VO AIDA
Astronomical Architecture for Data Access
I3, eInfrastructure, Scientific Digital Repositories
Networking, Service and R&D
8 partners, 2.7 M€,
30 months February 2008 – July 2010
Consortium members

- CNRS, France (CDS, France VO)
- European Space Agency
- European Southern Observatory
- INAF, Italie (Trieste, VObserve.it)
- INTA, Spain (SVO)
- U. Groningen (NOVA)
- The University of Edinburgh (AstroGrid)
- U. Heidelberg (ARI, GAVO)
EuroVO-AIDA objectives

EuroVO-AIDA ensures the transition of the European astronomical Virtual Observatory to operations

- Large scale deployment by data centres
- Construction of a community of science users
- Technical activities: definition/evolution of interoperability standards (DAL/DM), relevance of new technologies

and Liaison with other communities

Outreach towards higher education and public
Welcome to the Euro-VO AIDA Astronomical Infrastructure for Data Access

This is the web-based collaboration area of the Euro-VO Astronomical Infrastructure for Data Access project. This project is supported by EU in the framework of the FP7 infrastructure Scientific Research Repositories initiative (project RI2121104). It started on 1 February 2008, for a duration of 30 months.

Highlights

- **EURO-VO in the ICT results**: e-Infrastructures give real boost to virtual observatories - Issued on 8 October 2008.
- Fourth Euro-VO Technology Forum: 22 - 24 September 2009, Trieste
- Data Centre Workshop on how to publish data in the VO: 22-26 June 2009, ESAC, Villanueva del Castillo
- **EuroVO-AIDA Hands-on workshop**: 30 March - 2 April 2009, ESO, Garching
- Third Euro-VO Technology Forum: 16 - 18 March 2009, Strasbourg Due to a strike warning on March 19, the meeting will be held March 16 -18
- Full Harvestable EuroVO Registry of Resources has been released (13 Mar 2009)
- EuroVO-AIDA Workshop MultiWavelength astronomy and the Virtual Observatory: December 1-3 2008, ESAC, Villanueva del Castillo
- **Second Euro-VO Technology Forum (with VO-TECH)**: 29 September - 2 October 2008, Cambridge, UK
- First Euro-VO Technology Forum (with VO-TECH): March 17 - 19 2008, Strasbourg

François Genova, 29 September 2008, Cambridge
Governance

• Board/Work Package Management Team
• Scientific guidance
  – Scientific Advisory Committee
  – Internal Science Team: the project scientists, which participate in all EuroVO-AIDA activities
Science Advisory Committee

The EURO-VO Science Advisory Committee (SAC) is composed of leading European researchers outside mainstream VO projects. It also includes at least one representative from a non-European VO project. The selection of the EURO-VO SAC is done by the EURO-VO Executive Board based on input from the EURO-VO Facility Centre (FC), Data Centre Alliance (DCA), Technology Centre (TC), and ESA VO Scientists. Members are invited to actively participate in the meetings of the EURO-VO SAC, which will happen approximately twice a year. The participation in the meetings is financed by the EURO-VO Project. The EURO-VO SAC Chair is selected by the EURO-VO Executive Board. The EURO-VO FC Scientist acts as EURO-VO SAC Secretary. The EURO-VO DCA, TC, and ESA VO Scientists are also "de facto" members of the EURO-VO SAC.

The EURO-VO SAC advises the EURO-VO Project in the following areas:

- High-level science requirements for the EURO-VO;
- Promotion of VO science in Europe;
- VO tools and their astronomical applications;
- Existing European astronomical archives with suggestions for improvements;
- EURO-VO Science Operation concepts;
- Progress review of EURO-VO.

The EURO-VO SAC includes the following astronomers:

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<thead>
<tr>
<th>Name</th>
<th>Affiliation</th>
<th>E-mail</th>
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<tbody>
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<tr>
<td></td>
<td>de Cantabria, Spain</td>
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</tbody>
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Françoise Genova, 29 September 2008, Cambridge
Support to/feedback from users

• Science Initiatives
• Workshops
  – Topical meeting on Multiwavelength astronomy
  – Hands-on meeting (PhDs, post-docs)
• On-line tutorials
Calls for proposals: ‘Complex’ usage of VO

Within the framework of AIDA (Astronomical Infrastructure for Data Access), the European Virtual Observatory project is seeking proposals from teams carrying out archival astronomical research or projects that could benefit from the virtual observatory concept. The virtual observatory tools and applications allow researchers access to nearly all the world's large data archives such as ESO, EDA, or CID. They also allow users to access a huge variety of data and catalogues and to perform their own analyses of images, spectra and other data. Successful applicants will receive support from EVO-AIDA in using the VO facilities and software to carry out their projects.

Françoise Genova, 29 September 2008, Cambridge
First ‘Community feedback’ Workshop (D2.2)
The European Virtual Observatory EURO-VO

The EU-VO project aims at deploying an operational Virtual Observatory (VO) in Europe. Its objectives are to provide technology take-up and VO-compliant resource provision, building the technical infrastructure and to support its utilization by the scientific community.

Technical downtime
The EU-VO-DCA and EU-VO-AIDA pages linked above are currently experiencing technical problems. We are working to restore these pages.
Registration for the EU-VO-AIDA school is not affected.

News & Highlights

Second EU-VO-AIDA School
26-28 January, 2010. The Virtual Observatory (VO) is opening up new ways of exploiting the huge amount of data provided by the ever-growing number of ground-based and space facilities. The goals of the School, held at the Observatoire de Strasbourg are to expose European astronomers to the variety of VO tools and services available today so that they can use them efficiently for their own research.
To achieve these goals, VO experts will lecture and tutor the participants on the usage of such tools. Real life examples of...
News & Highlights

Second EuroVO-AIDA School
25-28 January, 2010. The Virtual Observatory (VO) is opening up new ways of exploiting the huge amount of data provided by the ever-growing number of ground-based and space facilities. The goals of the School, held at the Observatoire de Strasbourg are to expose European astronomers to the variety of VO tools and services available today so that they can use them efficiently for their own research.

To achieve these goals, VO experts will lecture and tutor the participants on the usage of such tools. Real-life examples of scientific applications will be given, some of them selected from the science cases that participants will be asked to submit at the time of registration. A large fraction of the time will be dedicated to hands-on exercises, which will allow participants to become fully familiar with the VO capabilities.

Deadline for registration is November 20, 2009. For more details, visit the workshop’s web page.

Swiss VO day
The Geneva observatory in collaboration with the EURO-VO is organizing the Swiss VO day, to take place on January 21, 2010, in Geneva. The workshop will host about 30 Swiss astronomers and will follow the same format as the ESO and Spanish VO days, namely short introductory talks and hands-on sessions.

VO day in Tour
The Euro VO-AIDA project, INAF-OATs in collaboration with INAF-SI (VCObs.it) and other INAF structures and Italian University, organize for the Italian community in several INAF structures, a day and a half long workshops devoted to the VO. The aim is to expose astronomers to the variety of VO tools and services available today with a particular care on Italian VO experiences and tools. The VO day in Tour officially starts in Trieste on November 30, with several future dates already fixed. A preliminary page of this initiative can be found at http://www.as.oats.inaf.it/voday.

Second EuroVO-AIDA Research initiative:
Within the framework of AIDA (Astronomical Infrastructure for Data Access), the EURO-VO project is seeking proposals from teams carrying out astronomical projects that may benefit from the Virtual Observatory concept. The projects are to make use of the Virtual Observatory tools and applications, that allow users to access a huge variety of reduced multiwavelength data and perform high-level analysis of images, spectra and large tabular datasets. The successful projects will receive support from EURO-VO astronomers to complete their goals. Interested teams should send their applications no later than July 15, 2009. More details can be obtained from the contact persons.

Subscribe to the EURO-VO mailing list to receive the latest EURO-VO Announcements.

Françoise Genova, 29 September 2008, Cambridge
Euro-VO activities are used as template for project activities
Support to data providers

- Census of European data centres
- Data Centre Workshop to teach how to publish data in the VO
- The end of a cycle
Tools resulting from outreach user requirements (D5.1)

Françoise Genova, 29 September 2008, Cambridge
Euro-VO Registry of Resources (from ESA registry)
Technology activities

• Bi-annual Technology Forums
  Very useful to discuss activities and build collaborations

• Standards
  Maby presentations in the coming days

• ‘New technologies’
  – Web 2.0 for data centres (CDS)
  – Semantics and ontologies (INAF with CDS)
  – Data mining (UEDIN)
User interface – view annotations

Françoise Genova, 29 September 2008, Cambridge
Euro-VO Results

• A very significant increase in collaboration
  – Technical collaboration, e.g. on the definition of standards and tools
  – Different kinds of meetings which have shaped the collaborations and relations with data centres and users

• Attention given to non-partner European countries to help them shape their own politics
The future

• Define articulation/balance between national/Agency level and European level
• Sustainability of national/Agency projects
• Sustainability of the European layer
  – Strongly dependent on European funding opportunities
  – Continuing European/international coordination is mandatory

• New projects emerging in ‘neighboring’ disciplines (HELIO, Europlanet, VAMDC)
• The VO is part of the Astronet Roadmap
ASTRONET was created by a group of European funding agencies in order to establish a comprehensive long-term planning for the development of European astronomy. The objective of this effort is to consolidate and reinforce the world-leading position that European astronomy has attained at the beginning of the 21st century.

The success of present-day European astronomy has been built by combining previously scattered resources into multilateral partnerships, the most important of which are ESO for ground-based optical astronomy and ESA for space astronomy. Developing this concept and its impact and expand it to all domains of astronomy and all of Europe requires a shared, comprehensive Science Vision and roadmap for future infrastructures in astronomy. In parallel, the barriers which impede coordinated joint projects among countries must be identified, and ways to overcome these barriers must to be proposed and tested.

To do so, ASTRONET will cover all astrophysical objects from the Sun and Solar system to the global structure of the Universe, as well as every observing approach, in space and from the ground, and from radiation at any wavelength to astroparticles and gravitational waves. It will address the whole "food chain" from the early universe to stars and black holes, and finally to remnants of stellar nucleosynthesis.

The Press Conference for the Infrastructure Roadmap was held on November 25, 2008 at the Academy of Sciences (Paris) at 10:00 AM. For more information, the ASTRONET Infrastructure Roadmap and the Executive Summary Brochure are now available in PDF format.
Theory, Computing and Data Archiving

The development of theory and computing capacity must go hand-in-hand with that of observational facilities. Systematic archiving of properly calibrated observational data in standardised, internationally recognised formats will preserve this precious information obtained with public funds for future use by other researchers, creating a Virtual Observatory (VO).

The Virtual Observatory will enable new kinds of multi-wavelength science and presents new challenges to the way that results of theoretical models are presented and compared with real data. Along with other initiatives, the Roadmap proposes that a European Astrophysical Software Laboratory (ASL), a centre without walls, be created to accelerate developments in this entire area on a broad front.
6.6 Recommendations

I. Relevant to VO

1. Provision of a public VO-compliant archive should be an integral part of the planning for any new facility. We recommend that data centres provide science-ready data.

2. Providers of astronomical tools should make them VO-compliant so they can easily talk to other VO tools and can be accessed within the VO environment.

3. The infrastructure established with EC support will need to be sustained by the national funding agencies to allow continuity of the VO.

4. The development of the VO should be coordinated with evolution of the generic e-infrastructure, and that evolution should reflect the domain-specific needs of astronomy.

5. To prepare for the challenges posed by large surveys, multi-wavelength astronomy and the VO, modelling codes need to be made modular.

6. Substantial investments are required in software that simulates mock data with the observational biases inherent in current and future facilities. Publication of such software in VO-compliant form should become an integral part of the construction of any instrument.