

Euro-VO

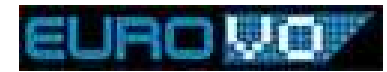


F. Genova, Interoperability meeting, 9 November 2009



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



F. Genova, Interoperability meeting, 9 November 2009



2MASS
ESO-WFI
Chandra
VLT-ISAAC
HST-ACS
DSS
My Data

Data Tree

- GOODS-WFI
 - DEEP2C-FV-PREVIEW 38.1 'x37.3' 2000-10-26
 - DEEP2C-FV 8.2 'x8.2' 2000-10-26
- GOODS-ACIS
 - ACISMCDPSN000 1.2 'x1.2' 1999-10-14
- GOODS-ISAAC
 - GOODS-10 2.5 'x2.5' 08/04/2002
 - GOODS-11 2.5 'x2.5' 08/04/2002
 - GOODS-14 2.5 'x2.5' 08/04/2002
 - GOODS-15 2.5 'x2.5' 08/04/2002
 - GOODS-20 2.5 'x2.5' 08/04/2002
 - GOODS-16 2.5 'x2.5' 08/04/2002
 - GOODS-21 2.5 'x2.5' 08/04/2002
 - GOODS-9 2.5 'x2.5' 08/04/2002
- GOODS-HST-ACS
 - F775W
 - epoch1
 - epoch2
 - epoch3
 - epoch4
 - epoch5
 - version1.0
 - CDF-SOUTH-SECT32-VERSIO
 - CDF-SOUTH-SECT25-VERSIO
 - CDF-SOUTH-SECT23-VERSIO
 - CDF-SOUTH-SECT21-VERSIO
 - CDF-SOUTH-SECT44-VERSIO
 - CDF-SOUTH-SECT14-VERSIO
 - CDF-SOUTH-SECT42-VERSIO
 - CDF-SOUTH-SECT12-VERSIO
 - CDF-SOUTH-SECT35-VERSIO
 - CDF-SOUTH-SECT33-VERSIO
 - CDF-SOUTH-SECT31-VERSIO
 - CDF-SOUTH-SECT24-VERSIO
 - CDF-SOUTH-SECT22-VERSIO
 - CDF-SOUTH-SECT45-VERSIO
 - CDF-SOUTH-SECT43-VERSIO
 - CDF-SOUTH-SECT13-VERSIO
 - CDF-SOUTH-SECT11-VERSIO
 - CDF-SOUTH-SECT34-VERSIO

Data available at selected point are highlighted in tree

Info Frame

CDF-SOUTH-SECT23-VERSION1.0

Observation_Name	CDF-SOUTH-SECT23-VERSION1.0
ObservingProgram_Name	GOODS-HST-ACS
FilterName	F775W
Size_alpha	4.1'
Size_delta	4.1'
Angular Pixel Size	0.029"
Origin	STSCI
OriginalCoding	FITS
CentralPoint_RA	03:32:38.72
CentralPoint_DEC	-27:48:18.3
DateAndTime	2002-08-01
Position Angle	0.0°

Cutout Target: 03 32 33.50 -27 47 36. Grab

Stick FoV in stack LOAD Close

Image metadata

A.V.O demonstration prototype v1.0

Load... Save... Plugins... Print... Help... Quit

Field: 03:32:25.77 -27:48:07.4 38.08'x37.2'

Field of view outlines are plotted automatically

Field of view outlines are plotted automatically

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

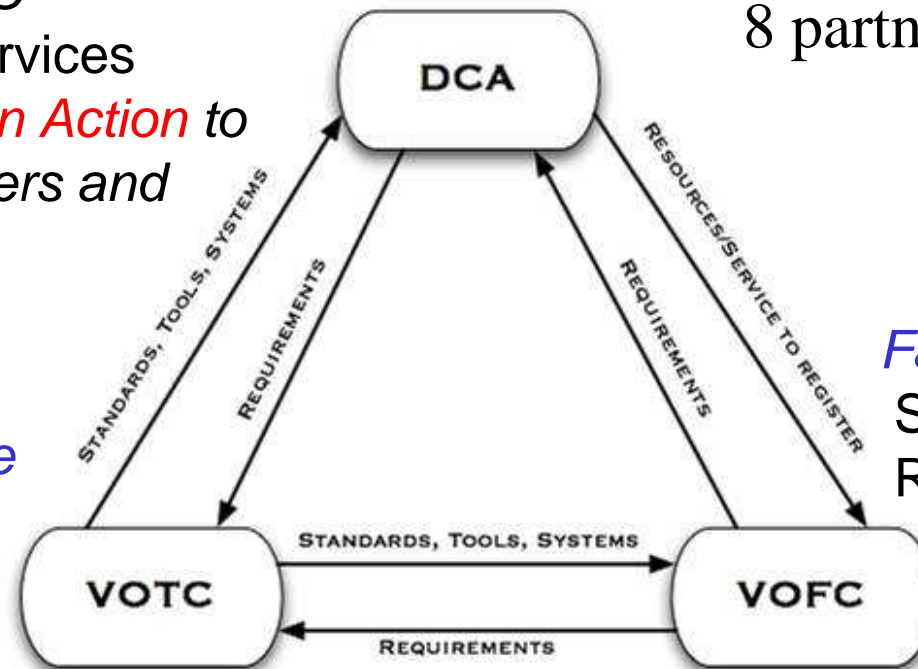
Distributed

- **FP6 VO-TECH**
Infrastructure
Design Study
- ESA-VO (et al.)



Euro-VO

Best effort alliance
8 partners

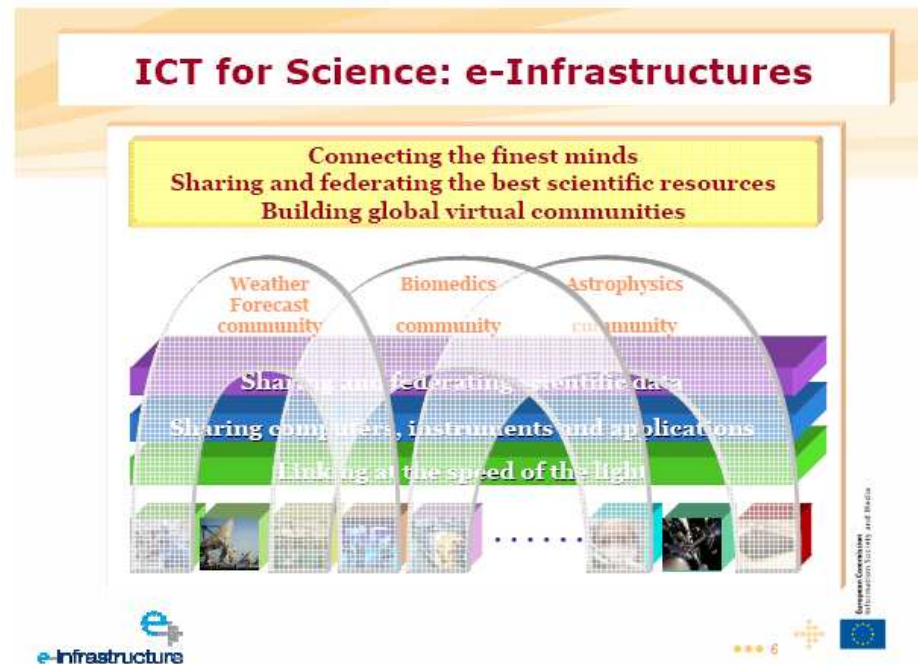


Facility Centre

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, VObs.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

WebHome < EuroVOAIDA < TWiki - Mozilla Firefox

http://cds.u-strasbg.fr/twikiAIDA/bin/view/EuroVOAIDA/WebHome

EURO VO AIDA Astronomical Infrastructure for Data Access

Jump Search

EuroVOAIDA

Log In or Register

EuroVOAIDA Web

- Create New Topic
- Index
- Search
- Changes
- Notifications
- RSS Feed
- Statistics
- Preferences

Webs

- EuroVOAIDA
- AidaVOWS2009
- VOSchool09
- VOSchool10
- Main
- Sandbox
- TWiki

Links

- Euro-VO
- VOA
- EuroVO-DCA
- VOTech

TWiki > EuroVOAIDA Web > WebHome (09 Oct 2009, MathiasDepretz) Edit Attach

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 2009.
- [Fourth Euro-VO Technology Forum](#): 22 - 24 September 2009, Trieste
- [Second EuroVO-AIDA Research Initiative](#). Deadline 15 July 2009.
- [Data Centre Workshop on how to publish data in the VO](#) 22-26 June 2009, ESAC, Villafranca 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, Villafranca del Castillo
- [Second Euro-VO Technology Forum \(with VO-TECH\)](#) : 29 September - 2 October 2008, Cambridge, UK
- [First EuroVO-AIDA Research Initiative](#). Deadline 15 June 2008.
- [First Euro-VO Technology Forum \(with VO-TECH\)](#): March 17 - 19 2008, Strasbourg

Governance

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

The screenshot shows a web browser window with the URL <http://www.euro-vo.org/pub/fc/sac.html>. The page features the EURO-VO logo and navigation links for VOTECH, EuroVO-DCA, and EuroVO-AIDA. A left sidebar contains a menu with categories: Science (with sub-items like Software, Recipes User Manual, Scientific Workflows, AIDA Research Initiative, Scientific Papers, Science Advisory Committee, Acknowledging, Helpdesk), Technical (with sub-items like Software, Registries, Tutorials, IVOA Standards), and Data Centres (with sub-items like Overview, Partners, Work Packages, Tutorials). The main content area is titled "Science Advisory Committee" and contains a paragraph describing the committee's composition and role. Below this, it lists the areas the committee advises on, followed by a list of member astronomers with columns for Name, Affiliation, and E-mail.

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 financially supported 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.

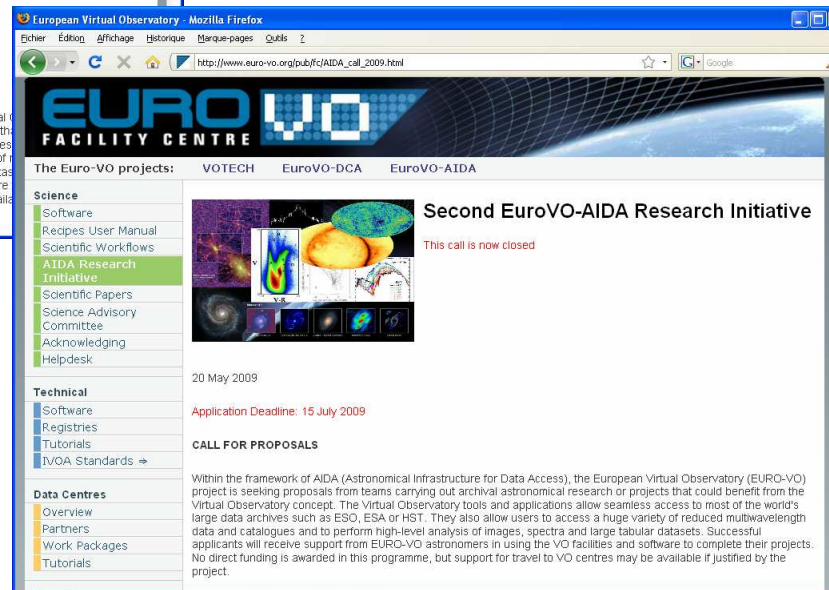
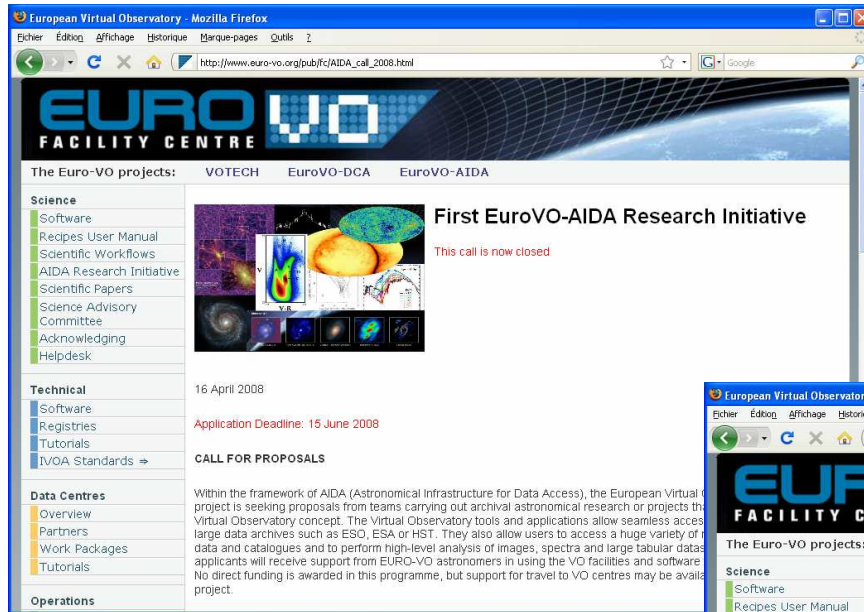
The EURO-VO SAC includes the following astronomers:

Name	Affiliation	E-mail
Francisco Carrera (Chair)	Instituto de Física de Cantabria, Spain	carreraf@ifca.unican.es

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





Workshop - Mozilla Firefox

http://MultiwavelengthVOWorkshopDec2008/

WebHome < EuroVOD... WebHome < EuroVOA... WebHome < Main < T... WebHome < Main < P... WebHome < Main < T...

2008: ESAC - Madrid, Spain

MULTI-WAVELENGTH ASTRONOMY & VIRTUAL OBSERVATORY
Workshop at ESAC, 1-3 Dec 2008

ESAC	ESA-VO	EURO-VO	IWOA	Weather
Purpose & Goals				
<p>Purpose & Goals</p> <p>What is the VO</p> <p>Venue</p> <p>Accommodation</p> <p>Invited Speakers</p> <p>Scientific Program</p> <p>Poster</p> <p>Registration</p> <p>Participants</p> <p>Proceedings</p> <p>Deadlines</p> <p>STOC</p> <p>LOG</p> <p>Contact</p>				
<p>The EURO-VO project, in the framework of the EURO-VO Astronomical Infrastructure for Data Access (AIDA), is organizing an international workshop at the European Space Astronomy Centre (ESAC).</p> <p>As new and older ground-based and space facilities will continue providing multi-wavelength data in a variety of formats and multi-chip instruments and large Surveys are expected to increase the data inflow by orders of magnitude, the VO is becoming indispensable for accessing and handling the exponentially increasing data volume. The goals of the workshop is to pinpoint the challenges multi-wavelength astronomy will be facing in the coming years and to identify how the unique capabilities intrinsic to the VO concept, such as simultaneous access to different archives, metadata describing the content and quality of the data packages or tools to e.g. cross-correlate the various datasets, can meet them.</p> <p>To achieve these goals, the workshop will bring together experts in multi-wavelength galactic and extragalactic astronomy and scientists and engineers actively involved in the international VO initiative.</p> <p>Among others the following topics will be addressed:</p> <ul style="list-style-type: none"> • Multi-wavelength science/surveys: present and future status, needs, tools, facilities. • Data quality in the VO (Metadata). • Building Spectral Energy Distributions (SEDs) in the VO. • Filters in the VO. • VO standards for the access of multi-wavelength data. • Photometry data model [IWOA data model "to come"]. • Smart queries in the VO (based on S/N, redshift, etc). • Cross-correlation in the VO. <p>In order to ensure an intense debate and a high level of interaction, a substantial fraction of the Workshop will be dedicated to round-table discussions focused on each of the above topics. The participants are</p>				
  				

First 'Community feedback' Workshop (D2.2)



European Virtual Observatory - Mozilla Firefox

Fichier Édition Affichage Historique Marque-pages Outils ?

http://www.euro-vo.org/pub/

Google

EURO VO

The Euro-VO projects: [VOTECH](#) [EuroVO-DCA](#) [EuroVO-AIDA](#)

Science

- Software
- Recipes User Manual
- Scientific Workflows
- AIDA Research Initiative
- Scientific Papers
- Science Advisory Committee
- Acknowledging
- Helpdesk

Technical

- Software
- Registries
- Tutorials
- IVOA Standards →

Data Centres

- Overview
- Partners
- Work Packages
- Tutorials

The European Virtual Observatory EURO-VO

```

graph TD
    FC[Facility Centre] --- DCA[Data Centre Alliance]
    FC --- TC[Technology Centre]
    DCA <--> TC
  
```

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

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

News & Highlights

NEW [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

European Virtual Observatory - Mozilla Firefox

Fichier Édition Affichage Historique Marque-pages Outils ?

http://www.euro-vo.org/pub/

VOA Standards

Data Centres

- Overview
- Partners
- Work Packages
- Tutorials

Operations

- Overview
- Partners
- Work Packages

About

- Introduction
- Presentations
- Structure
- Partners
- News
- Calendar
- Vacancies
- Glossary
- Q&A
- EC Support

Press Room

- Media

Links

News & Highlights

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NEW [Swiss VO day](#)
 The Geneva observatory in collaboration with the EURO-VO is organising 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.

NEW [VO day ... in Tour](#)
 The Euro VO-AIDA project, INAF-OATs in collaboration with INAF-SI (VObs.it) and other INAF structures and Italian University, organize for the Italian community in several INAF structures, a day and a half log workshops devote 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

JourneeOVLAB2009 < ASOVFrance < TWiki - Mozilla Firefox

Echier Edition Affichage Historique Marque-pages Outils ?

Log In or Register

ASOVFrance Web

- Create New Topic
- Index
- Search
- Changes
- Notifications
- RSS Feed
- Statistics
- Preferences

Webs

- ASOVFrance
- CASscientifiques
- Exposes
- GROUPEStravail
- JOURNEESpecifiques
- Liens
- LiensStic
- Main
- PresentationsOV
- Ressources
- Reunions
- Sandbox
- TWiki

Journée Observatoire Virtuel au Laboratoire d'Astrophysique de Bordeaux

24 septembre 2009, Bordeaux

Programme

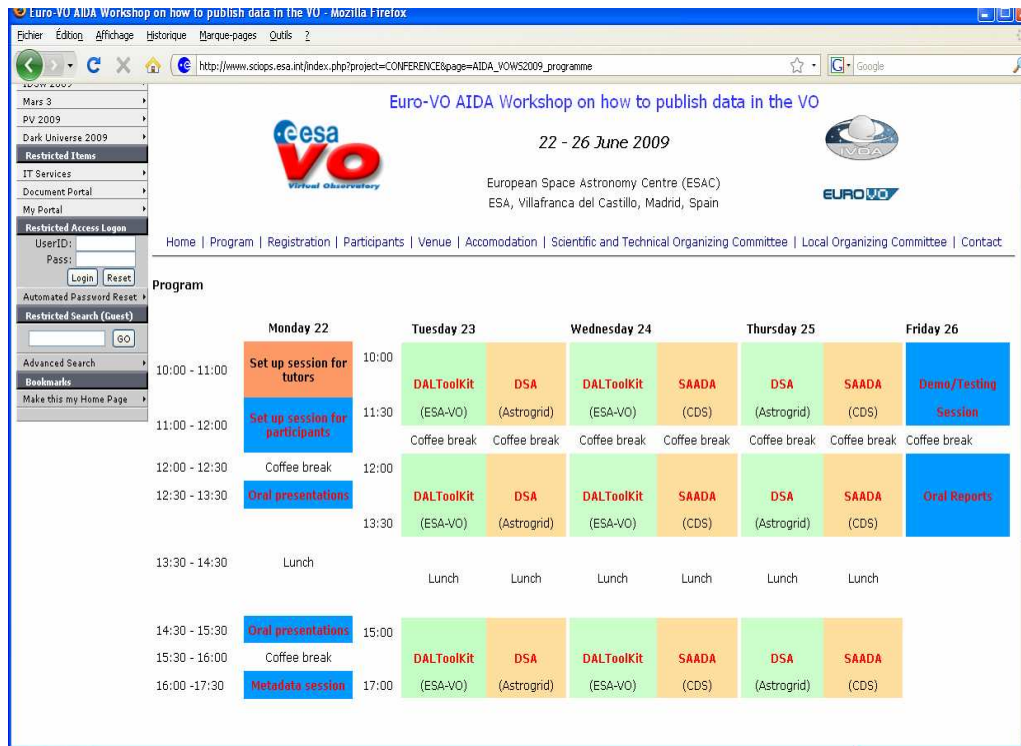
- **Matin** : présentations sur l'Observatoire Virtuel (9h30-12h30)
 1. Introduction à l'Observatoire Virtuel (C. Bot) [.pdf](#)
 2. Les standards de l'Observatoire Virtuel, supports de l'interopérabilité (T. Boch) [.ppt](#)
 3. Présentation des outils (C. Bot, T. Boch)
 - Outils du CDS (C. Bot) [.pdf](#)
 - Outils de l'OV (T. Boch) [.ppt](#)
- **Après-midi** : sessions "hands-on" (14h-17h)
 - Exercice "Orion KL": [Recherche des données \(images, spectres, catalogues\) disponibles pour un objet donné](#)
 - Exercice "Metadonnées": [Transformation d'un fichier texte en VOTable - Ajout des métadonnées](#)
 - Exercice "Spectres stellaires": [Utilisation de VODesktop et de VOSpec pour une recherche de spectres stellaires et leur visualisation](#)
 - Exercice "Exoplanètes": [Recherche Vizier par UCDS, selections avec TOPCAT, interrogation de SIMBAD par script](#)
 - Exercice "Brown Dwarfs": [Scripts Aladin](#)

Liste des logiciels utilisés durant la session "hands-on"

- [Aladin](#) : atlas interactif du ciel et portail VO
- [TOPCAT](#) : outil interactif de manipulation de tables (ajout de colonnes, tri, sélection, tracé de plot 2D, plot 3D, histogrammes, cartes de densité, etc)
- [STILTS](#) : pendant de TOPCAT en ligne de commande
- [VOSpec](#) : visualiseur de spectres
- [VODesktop](#) : outil du consortium [AstroGrid](#) permettant de rechercher des ressources VO (services d'images, de catalogues ou de spectres) dans l'annuaire de l'Observatoire virtuel ("registry"), et de les interroger

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

stellarium

Arcturus (α Boo) - HP 69673 A

Magnitudine: 0.15 (B-V: 0.82)
 Magnitudine assoluta: -0.11
 RA/DE (J2000): 14h15m39.7s/+19° 10'53.7"
 RA/DE (della data): 14h16m6s/+19° 8'19"
 Angolo orario/DE: 18h37m13s/+19° 8'19"
 Az/Alt: +62°39'48"/+19°56'54"
 Classe spettrale: K2IIIp
 Distanza: 36.71 Anni Luce
 Parallasse: 0.08895

Aladin v5.9 * UNDERGRADUATE MODE (based on v5.915) *****

File Edit Image Catalog Overlay View Help

Search

Target: NGC 891 [ok]

Examples:

M51 22 37 04.29 +34 24 58.5

Coma Cluster

NGC 891

M 101

NGC 1055

Full screen Preferences Help

Objects options

Tooltips activated

- Star (15)
- Galaxy (10)
- Nebula, PN, SNR (33)
- HII region
- IR object (2)
- UV object (23)
- Other types (27)
- Radio, HI, Maser (2)
- X-ray object (34)

Print Center image

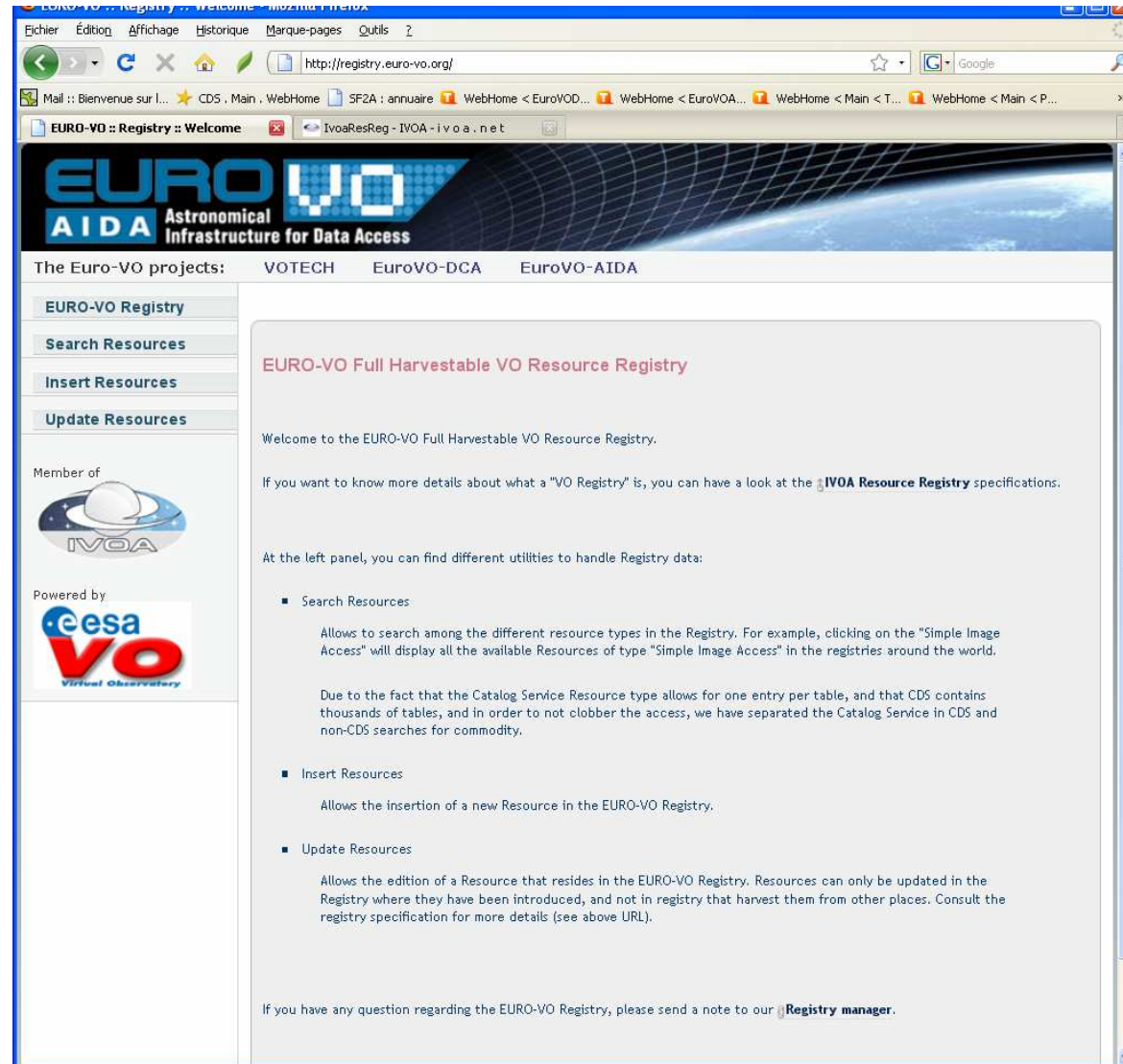
TYPE	OTYPE	MAIN_ID	RA	DEC	B	V	SP_TYPE	PMRA	PMDEC	BIBLIST	GALDIM_MAJ
Galaxy	RadioG	SB8_B0219+4207	02 22 32.40	+42 20 44.0						3	
Galaxy	PartoG	JBPS971NGC_891_1	02 22 24.21	+42 21 45.3						1	
Galaxy	PartoG	JBPS971NGC_891_2	02 22 30.78	+42 20 34.6						2	
Galaxy	Galaxy	ZOAG_G140_39-17_38	02 22 40.70	+42 22 40.0						1	
Galaxy	EmG	CXOSEXSL_1022205_0+422338	02 22 05.08	+42 23 37.7						3	
Galaxy	AGN	CXOSEXSL_1022210_B+422016	02 22 10.93	+42 20 36.1						3	

Tools resulting from outreach user requirements (D5.1)



Françoise Genova, 29 September 2008, Cambridge

Euro-VO Registry of Resources (from ESA registry)



The screenshot shows a web browser window displaying the Euro-VO Registry website. The browser's address bar shows the URL <http://registry.euro-vo.org/>. The website header features the Euro-VO logo and the text "AIDA Astronomical Infrastructure for Data Access". Below the header, there are navigation links for "The Euro-VO projects:" including VOTECH, EuroVO-DCA, and EuroVO-AIDA. A sidebar on the left contains a menu with "EURO-VO Registry", "Search Resources", "Insert Resources", and "Update Resources". It also includes logos for "Member of IVOA" and "Powered by Ceesa VO Virtual Observatory". The main content area is titled "EURO-VO Full Harvestable VO Resource Registry" and contains a welcome message, a link to IVOA Resource Registry specifications, and a list of utilities: "Search Resources", "Insert Resources", and "Update Resources", each with a brief description of its function.

Technology activities

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

http://cds-d...05bag%3D%3D

<&CDS.head 'View comments' "" "" >

userTest5 [Preferences](#) [Logout](#)

Comments about MCG+00-12-002 object

Add a comment | [Subscribe to this page](#) | [Stop mail surveillance](#)

Visualization and filter options

152 annotation(s) currently in list

View: include archived Threads: [expand/unexpand](#)

Sort by: [Date](#) Pages: [1](#) [2](#) [3](#) [4](#) [5](#) [6](#) [7](#) [8](#) [9](#)

bibest on 17/09/2009 at 2:52 pm There is a problem with this object, so I post an error notification.

▼ 1 reply

userTest5 on 17/09/2009 at 2:54 pm OK, the CDS team will see what can be done.

bibest on 17/09/2009 at 2:51 pm Here is an annotation.

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 : TOWARDS A STRATEGIC PLAN FOR EUROPEAN ASTRONOMY - Mozilla Firefox

Fichier Édition Affichage Historique Marque-pages Outils ?

http://www.astronet-eu.org/

www.astronet-eu.org search... search

ASTRONET

TOWARDS A STRATEGIC PLAN FOR EUROPEAN ASTRONOMY

Frontpage Networking Science Vision Infrastructure Roadmap Coordinated actions Private Area Site map 11-12-2008

ASTRONET

- Objectives
- Structure
- Project Management
- Contacts

ASTRONET ACTIVITIES

- Networking
- Science Vision
- Infrastructure Roadmap
- Coordinated actions
- Consortium Management
- Consortium Coordination
- Private Area

LINKS

- ASTRONET partners
- FP6
- FP7
- EC and astronomy
- European Astronomy
- Downloads
- Other links of interest

RESOURCES

- Document archive

WHAT IS ASTRONET ?



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 this 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 infrastructure and technology development to observation, including the

Latest Events

▶ **EUROPE'S 20-YEAR PLAN FOR ASTRONOMY UNVEILED :**

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.

▶ **ASTRONET JOINT CALL :**

The ASTRONET Joint Call Board recommends 5 proposals for funding by the national funding agencies. For more information.

▶ **ASTRONET SYMPOSIUM :**

The Astronet symposium presentations are now online.

▶ **PUBLIC RELEASE OF THE INFRASTRUCTURE ROADMAP :**

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

1. *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.