



IPDA and other Alliances: the IVOA case

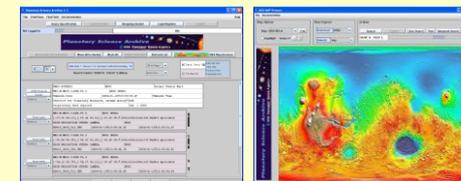
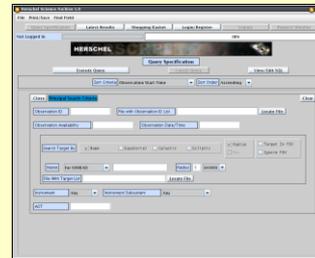
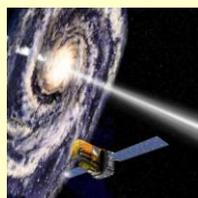
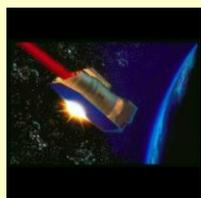
Pedro Osuna

Science Archives and ESA-VO Technical Coordinator

Science Archives and Computer Support Engineering Unit (SRE-OE)
European Space Agency

About us

- ❑ ESAC is the Centre where most of ESA Science and Robotic Exploration Directorate's Scientific Archives are developed, maintained and operated.
- ❑ ESAC Science Archives Team is giving support to various projects
 - <http://www.rssd.esa.int/index.php?project=ESAVO&page=archives>



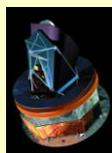
ISO Data Archive
Since December 1998

XMM-Newton Science Archive
Since April 2002

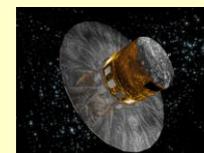
Integral SOC Science Data Archive
Since July 2005

Herschel Science Archive
Since April 2007 (in dev.)

Planetary Science Archive
Giotto, Mars Express
Rosetta, Venus Express
Smart-1, Huygens
Since March 2004



**Soho, Exosat, Planck, GAIA,
... in the future**



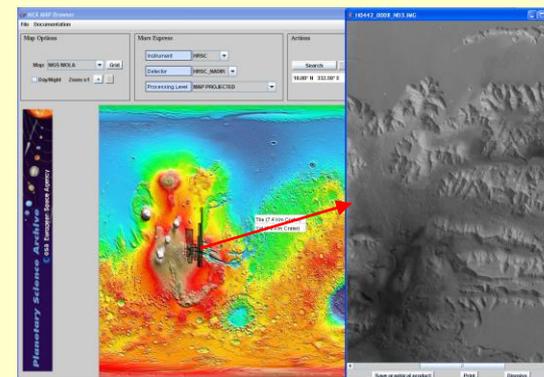
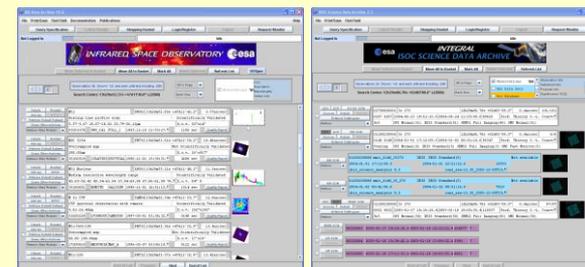
Archives at ESAC (cont'd)

❑ We give horizontal support to two divisions within ESA: Astronomy archives and Solar System Archives

- ❑ Scientific Archives geared to various users
 - Scientific Community (public access)
 - PI team and observers (controlled access)
 - Science Operations Team (privilege access)

- ❑ Common Architecture and Look and Feel
 - Better corporate image for ESA
 - Re-use of technical expertise

- ❑ User friendly access
 - Eg PSA Mars Map Browser



IPDA in relation with other International Alliances

- ❑ IPDA Chairman was invited to participate in last IVOA meeting in Trieste. Clear will from the IVOA to enhance communication with other Alliances

- ❑ Solar Physics data archives also invited to participate in this session

- ❑ Planetary Data and Astronomical Data share some objects and data; can benefit from interoperability among them

- ❑ How could we benefit from the experience in other areas (for instance, from IVOA):
 - We get the best from them and try to not make the same mistakes

International Virtual Observatory Alliance (IVOA)

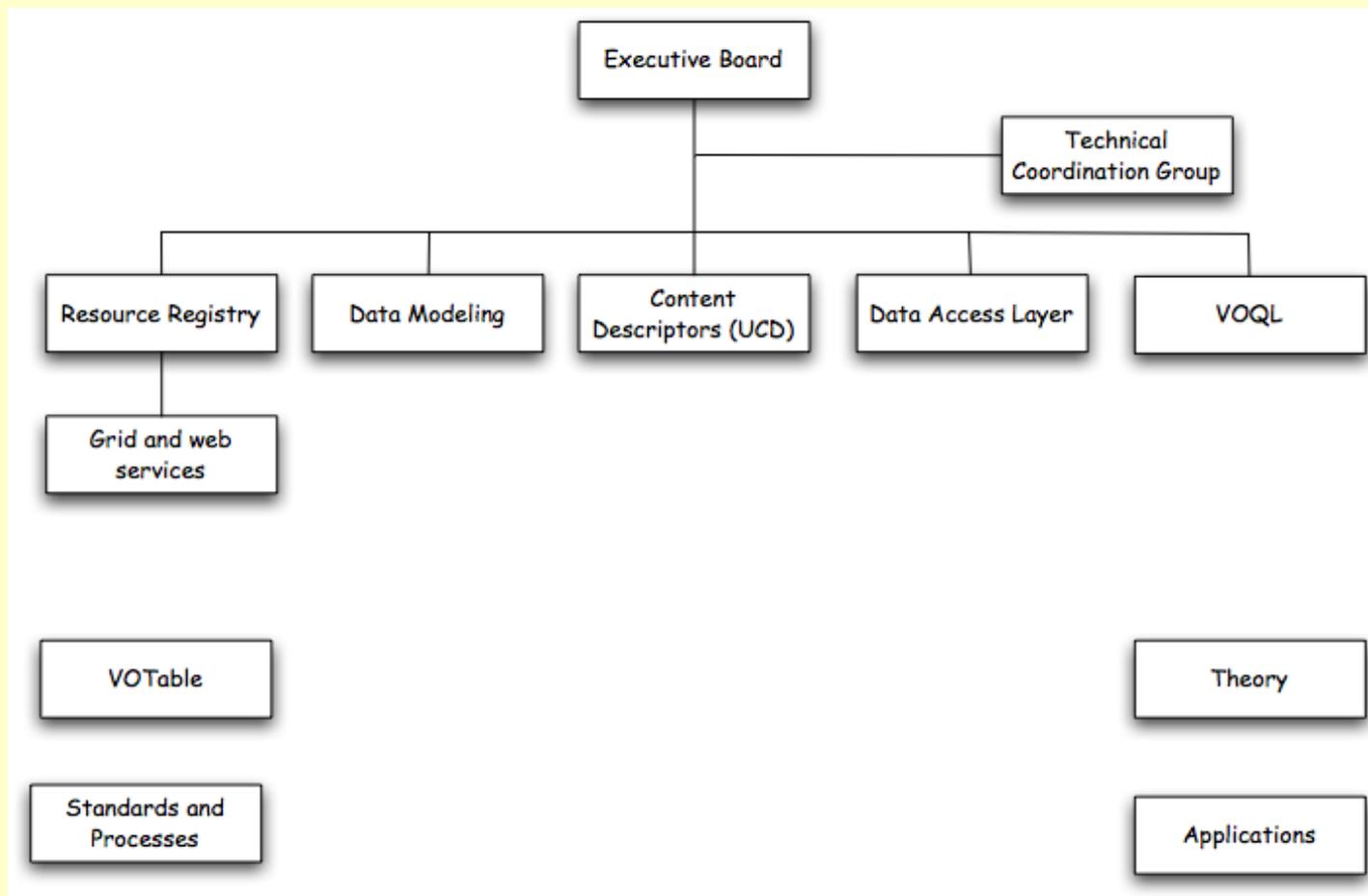
- ❑ In charge of defining Interoperability standards for the (Astronomical) Virtual Observatory

- ❑ Meets twice a year (spring and autumn) at “interop” meeting.

- ❑ Hardly any hierarchical structure → this is somehow unavoidable, as it is not a funding body

- ❑ Aforementioned point implies sometimes that only bottom-up approach is feasible: first implement, then propose as standard.

IVOA Working Groups Diagram



Registry

❑ Group definition:

[...]The IVOA Registry will allow an astronomer to be able to locate, get details of, and make use of, any resource located anywhere in the IVO space, i.e. in any Virtual Observatory. The IVOA will define the protocols and standards whereby different registry services are able to interoperate and thereby realise this goal. [...]

❑ Group Deliverables:

- Registry schema v1.0 (see references at the end)

😊 “Yellow pages”-like service for Registering Astronomical Data Providers allows easy identification of resources

😞 Curation of Registered services is VERY difficult

Data Modeling

❑ Group definition:

To define Data Models for the most common astronomical “objects” dealt with in Astronomy

❑ Subgroups:

- Spectral Energy Distribution
- Space Time Coordinates
- Provenance
- Observations
- Atomic and Molecular Line Transitions

😊 Defining Data Models allows to handle data without the need of investigating their form

☹ Not everything can be modeled. Should not try to get everything modeled before making it useful

UCD : Unified Content Descriptors

- ❑ Recently re-organised to deal with Semantics and Ontologies

- ❑ Initially defined to describe Uniform Content Descriptors, some sort of “Type descriptor”

- 😊 We already have PDS and Data Dictionaries at IPDA, so don't need to look further

Data Access Layer (I)

- ❑ Group definition:

[...] *The task of the DAL working group is to define and formulate VO standards for remote data access. Client data analysis software will use these services to access data via the VO framework; data providers will implement these services to publish data to the VO. [...]*

- ❑ One of the most important tasks for interoperability

😊 Access Protocols have proven to be extremely useful

😊 Our PDAP is fully compatible with their protocols

☹ Slow delivery of protocols.

VOQL : VO Query Language

- ❑ Group definition:

To create a language to access distribute data bypassing storage-specific settings

- ❑ First deliverable, the Astronomical Data Query Language (SQL-92 based language)

😊 Allows access to distributed data without caring how they are stored

😞 Access using the language might get difficult to implement

😐 Is it really needed to define a new language?

GRID / Web Services

❑ Group definition:

[...] *Use of Grid technologies and Web Services in the VO context - and investigation of required standards in this area.*[...]

😊 Grid technologies have proven to work very well for massive processing type work

☹ Software still has to be installed in the nodes. No easy solution for this problem yet

☹ Web technologies require lots of technical knowledge

VOTable

❑ Group definition:

[...] *VOTable is an XML format defined for the exchange of tabular data in the context of the Virtual Observatory.* [...]

😊 Very well established. Field-tested in hundreds of cases

😊 Parsers exist for it. Nothing new has to be implemented

😞😞 Does not describe properly structured data

Applications Interest Group

❑ Group definition:

[...] This interest group is intended to support developers and users of Virtual Observatory applications [...]

😊 Nice forum for interchange of concepts on applications that use VO technology

😊 😞 Overlap in functionalities of applications

Conclusions

- ❑ We should get benefit from the experience obtained in other fields
- ❑ But we should not make their same mistakes
- ❑ We should try to be as much interoperable with other alliances as possible
- ❑ Astronomical Virtual Observatory quite evolved. Solar Virtual Observatory quite dispersed, but many things done as well

- ❑ IVOA links for reference
 - Main IVOA twiki page: <http://ivoa.net/>
 - IVOA Working Groups
<http://www.ivoa.net/twiki/bin/view/IVOA/WebHome>