

News**IVOA meeting at ESAC: the Universe at your fingertips**

Attendees during the IVOA meeting at ESAC

23 May 2014

For astronomers, being able to access data from many telescopes in a quick and easy way is priceless. Objects can be observed at different wavelengths and times or rare phenomena can be found by rapidly sifting through huge sets of observations.

These are just two examples of the numerous capabilities that the Virtual Observatory (VO) is working to provide. By being a global effort to ensure efficient access to many astronomical archives, the VO provides the foundation of a major research infrastructure. This week, ESAC is hosting the International Virtual Observatory Alliance (IVOA) Spring 2014 Interoperability Meeting.

The IVOA was born in 2002 and is presently formed by twenty VO initiatives, 18 countries plus ESA and EuroVO as international bodies. IVOA "Interop" workshops take place twice a year to discuss and develop standards and applications. The 2014 Spring meeting involves around 125 participants from 15 countries. The organisation of the meeting is done by two of the IVOA members: ESA (through the ESA Science Archives and the VO team) and the Spanish Virtual Observatory (CAB, INTA-CSIC), both located at ESAC.

These meetings are opportunities for the individual Working and Interest Groups to have face-to-face discussions and tackle the more complex open issues.

"Getting people from various projects worldwide to agree on common standards represent very interesting challenges, which are not only technical", says Christophe Arviset, one of the workshop organisers and vice-chair of the IVOA. "These regular meetings provide a forum for solid advances to be made. Sometimes being in a meeting in person is the most efficient way to get this done."

The Virtual Observatory provides standards to allow different databases of science data to work together, as well as tools to enable to manipulation the data. "Ideally, scientists should not realise that they're using the VO. Transparency is the ultimate goal for the system", explains Enrique Solano, also involved in organising the workshop.

As an example; VO standards are used for the building of the science Archives at ESAC: SAMP (Simple Application Messaging Protocol) enables the transparent interconnectivity of the archives and external tools (Herschel and VOSpec or also Soho and Aladin). VO protocols are now fully embedded into the archive development process, like TAP (Table Access Protocol), VOSpace, not only on astronomical archives (ie Gaia, Euclid) but also for planetary ones (i.e.

Bepi-Colombo).

This week, several large projects (ALMA, JIVE/VLBI, LOFAR, MUSE and JWST) expressed their needs with regard to access to multi-dimensional data. Taking these needs into account, the IVOA can define the interoperability standards that will enable efficient science data exploitation for these science cases.

Many innovations have been achieved thanks to the VO's capabilities. Examples include the doubling of the number of poorly characterised classes of astronomical objects, such as ultracool sub-dwarves (a rare type of stars); or the improvement on the precision of orbital prediction of near Earth asteroids, in particular those classified as *Potentially Hazardous* to the Earth.

ESAC, the VO node for all European space based astronomy

ESAC is the Virtual Observatory node for all European space based astronomy, and ensures that all ESAC Astronomy Archives are accessible through the VO framework. The ESAC Science Archives and VO Team have been involved with the IVOA since it was first formed, through the ESAVO project.

The VO Team has helped create many IVOA Standards. They represent ESA on the IVOA Executive Board and Working Groups, and are involved in European level projects, such as Euro-VO. Also, they have developed the multi-wavelength spectral analysis VO tool, VOSpec.

The Spanish Virtual Observatory

The Spanish Virtual Observatory (SVO) joined IVOA in 2004. It manages the largest astronomical data centre hosted by a Spanish institution, including the archive of the Gran Telescopio Canarias (GTC). The SVO plays a leading role in VO science projects both at Spanish and European level -almost one third of the refereed VO-science papers published in the last years contain an SVO author. Also, it contributes significantly to other IVOA activities, developing data models, data access protocols and applications and tools (e.g. VOSA).

For more information:

www.ivoa.net

archives.esac.esa.int

svo.cab.inta-csic.es

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