IVOA Newsletter - October 2014

Subscribe | Newsletter archives | Write to the editors

IVOA Newsletter Editors: Mark G. Allen, Deborah Baines, Sarah Emery Bunn, Chenzou Cui, August Muench, Mark Taylor, & Ivan Zolotukhin.

The International Virtual Observatory Alliance (IVOA) was formed in June 2002 with a mission to facilitate the international coordination and collaboration necessary for the development and deployment of the tools, systems and organizational structures necessary to enable the international utilization of astronomical archives as an integrated and interoperating virtual observatory. The IVOA now comprises 20 VO programs from Argentina, Armenia, Australia, Brazil, Canada, Chile, China, Europe, France, Germany, Hungary, India, Italy, Japan, Russia, South Africa, Spain, Ukraine, the United Kingdom, and the United States and an inter-governmental organization (ESA). Membership is open to other national and international programs according to the IVOA Guidelines for Participation. You can read more about the IVOA and what we do at http://ivoa.net/about/.

What is the VO?

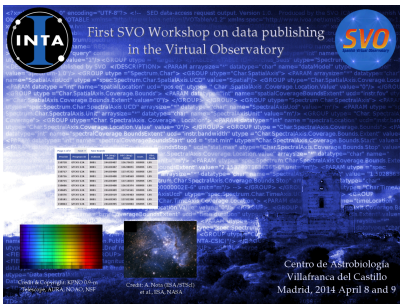
The Virtual Observatory (VO) aims to provide a research environment that will open up new possibilities for scientific research based on data discovery, efficient data access, and interoperability. The vision is of global astronomy archives connected via the VO to form a multiwavelength digital sky that can be searched, visualized, and analyzed in new and innovative ways. VO projects worldwide working toward this vision are already providing science capabilities with new tools and services. This newsletter, aimed at astronomers, highlights VO tools and technologies for doing astronomy research, recent papers, and upcoming events.

IVOA NEWS

Beyond the US VAO project Funding for the US Virtual Astronomical Observatory project discontinued at the end of September 2014. The legacy of the VAO will be preserved by a combination of efforts. Starting on October 1, the NASA archives began sustaining key components of the US VO infrastructure developed by the VAO, including the website, the registry, and service monitors. The NASA archives will also take an active role in the IVOA going forward.

All software, documentation, and other digital assets developed under the VAO is stored in the VAO Project Repository. Many VAO-developed tools and services will be sustained by the organizations that developed them within the VAO collaboration. For a complete list of these tools and services, and more information about the VAO closeout and continuation, please see the US VAO website summary.

Three more VO schools in Spain The Spanish Virtual Observatory has organized in the last months two VO schools in research institutes (Cantabria, June 2014; Valencia; July 2014) and one school in the framework of the Scientific Meeting of the Spanish Astronomical Society (Teruel, September 2014) with an attendance of more than 75 people. The main goal of the schools was to expose participants to the variety of VO tools and services available today so that they can use them efficiently for their own research. To achieve this goal, VO experts lecture and tutor the participants on the usage of such tools. Real life examples of scientific applications are given, some of them selected from the science cases proposed by the participants. More information on these meetings can be found on the SVO website.



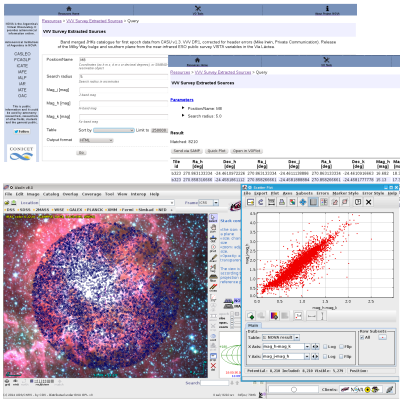
First SVO workshop on data publishing The Spanish Virtual Observatory organised in March 2014 a workshop on how to publish data in the VO. The workshop had a twofold objective: on one hand, to train participants on the usage of the publishing tools developed by the SVO through "hands-on" sessions in which they learn how to develop a VO service from scratch. On the other hand, to serve as a community-building exercise in which SVO staff and data providers know each other, data centres describe their needs and VO staff explains what the Virtual Observatory can offer to cover those needs. The workshop program and corresponding presentations have been made available at the SVO website.

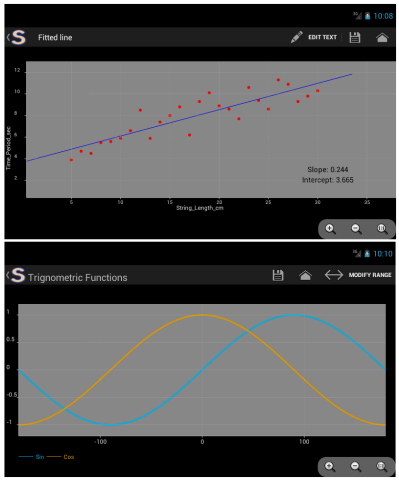
Moving forward with Data Standards The past six months have seen the recommendation of three new data standards. These include a recommended syntax for writing the string representation of unit labels ("VOUnits"), and the introduction of the Parameter Description Language (PDL), which intends to be an expressive language for self-descriptive web services exposing the semantic nature of input and output parameters. With the goal of providing fast spatial comparisons between image coverage maps, the Multi-Order Coverage map specification reached version 1.0. This version is based on the HEALPix sky tessellation algorithm, which is one way to provide a hierarchically based spatial index.

VO APPLICATIONS AND IMPLEMENTATION HIGHLIGHTS

Argentina Virtual Observatory's Data Center The Argentina Virtual Observatory, NOVA, announces the release of its new database, powered by the GAVO DACHs technology. Data can be queried through specific forms at the NOVA web pages or through any VO tool such as Aladin, SPLAT, TOPCAT, etc. The database will be fed with material collected by Argentinian astronomers, and it is expected to grow rapidly in the following months. Currently, the NOVA database includes a JHKs merged catalogue from the first data release of the ESO public survey of the Milky Way bulge and southern plane named ``VISTA variables in the Vía Láctea'' (VVV; Saito et al 2012)..

More Information: http://nova.iafe.uba.ar



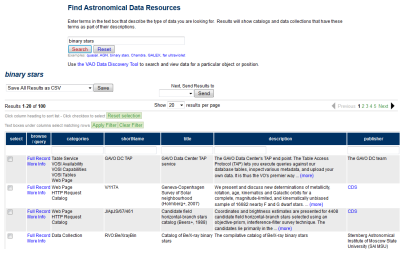


Stat-Lite - an Android Application VO-India has recently launched Stat-Lite - an Android application that provides an interactive and easy introduction to the concepts of Descriptive Statistics and Curve Plotting. It includes basic features like loading VOTable and ASCII formatted datasets and performing some basic statistical analysis such as correlation tests, summary statistics, etc. Some of the novel features of this application include graphs with multi-touch gesture support allowing the user to pan and zoom to study specific areas, and the ability to study the effect of outliers on regression fits by adding them using a simple interface. The interface and content has been designed for high-school and undergraduate students. It uses 'Apache Commons Math' library for statistical calculations and a third party charting API called 'AChartEngine' for rendering graphs. The curve plotting module, apart from having all the major categories of pre-defined functions, has the ability to plot any arbitrary mathematical function by writing it down as a combination of the functions in the existing library. The prime motivation of this development was making useful software available on low-cost Aakash (Sky) Android tablets being made available to students in India.

More Information:
http://vo.iucaa.ernet.in/~voi/voandroidsl.html

Upgrades to the US VAO registry at STScI The VAO project has upgraded their service registry hosted at STScI, including major underlying database changes to support evolving IVOA standard search interfaces and familiar client tools including TOPCAT. Curation efforts are ongoing, and the database migration includes the removal of many inactive services across the IVOA from the registry holdings, leading to better search results. A formal release with documentation and available code will be part of the VAO closeout, as will a functional 'wizard'-like form-based interface for data service curators to maintain their own registered information. A RegTAP service based on this upgrade is in progress.

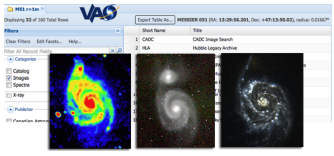
More Information: http://vao.stsci.edu/directory/ is the main user-facing search; service interfaces and further information is listed there under 'Developers'



TOPCAT and CDS X-Match TOPCAT now provides integrated access to CDS's excellent X-Match service. This means you can easily take a table loaded in TOPCAT and crossmatch it on sky position against any of the tables in the VizieR or Simbad databases, covering almost all published astronomical catalogues. It does the same job as TOPCAT's old multi-cone function, but is *much, much* faster, typically around a million rows a minute. A similar function is also available from the command line using STILTS. These matches impose no limit on table size.

More Information: http://www.starlink.ac.uk/topcat/

US VAO Data Discovery Tool: Version 1.7 released The US VAO released a new version of the Data Discovery Tool (v1.7) on August 25, 2014. With this tool you can find datasets from thousands of astronomical collections known to the VO and over wide areas of the sky, including thousands of astronomical collections — photometric catalogs and images — and archives around the world. New features of the Data Discovery Tool include: direct search of the Mikulski Archive for Space Telescopes (MAST), crossmatch search results with the major CDS catalogs via their X-Match service, or with MAST archive observations, and upload a target list into the tool for the purpose of crossmatching.



More Information: http://vao.stsci.edu/discover

SOME RECENT PAPERS ABOUT VO-ENABLED SCIENCE

Featured Publication

Orion revisited. II. The foreground population to Orion A
Bouy, H.; Alves, J.; Bertin, E.; Sarro, L. M.; Barrado, D
Astronomy & Astrophysics, Volume 564, id.A29, 12 pp. (2014).
Aims: Following the recent discovery of a large population of young stars in front of the Orion nebula, we carried out an observational campaign with the DECam wide-field camera covering ≈10 deg2 centered on NGC 1980 to confirm, probe the extent of, and characterize this foreground population of pre-main-sequence stars.
Methods: We used multiwavelength wide-field images and catalogs to identify potential foreground pre-main-sequence stars using a novel probabilistic technique based on a careful selection of colors and luminosities.
Results: We confirm the presence of a large foreground population towards the Orion A cloud. This population contains several distinct subgroups, including NGC 1980 and NGC 1981, and stretches across several degrees in front of the Orion A cloud. By comparing the location of their sequence in various color-magnitude diagrams with other clusters, we found a distance and an age of 380 pc and 5 ~ 10 Myr, in good agreement with previous estimates. Our final sample includes 2123 candidate members and is complete from below the hydrogen-burning limit to about 0.3 M⊙, where the data start to be limited by saturation. Extrapolating the mass function to the high masses, we estimate a total number of ≈2600 members in the surveyed region.
Conclusions: We confirm the presence of a rich, contiguous, and essentially coeval population of about 2600 foreground stars in front of the Orion A cloud, loosely clustered around NGC 1980, NGC 1981, and a new group in the foreground of the OMC-2/3. For the area of the cloud surveyed, this result implies that there are more young stars in the foreground population than young stars inside the cloud. Assuming a normal initial mass function, we estimate that between one to a few supernovae must have exploded in the foreground population in the past few million years, close to the surface of Orion A, which might be responsible, together with stellar winds, for the structure and star formation activity in these clouds. This long-overlooked foreground stellar population is of great significance, calling for a revision of the star formation history in this region of the Galaxy.

Refereed Publications

- The planetary nebula Abell 48 and its [WN] nucleus
  Frew, David J.; Bojičić, I. S.; Parker, Q. A.; et al.
  Monthly Notices of the Royal Astronomical Society, Volume 440, Issue 2, 19 pp. (2014).

- Type Ia Supernova Rate Measurements to Redshift 2.5 from CANDELS: Searching for Prompt Explosions in the Early Universe
  Rodney, Steven A.; Riess, Adam G.; Strolger, Louis-Gregory; et al.
  The Astronomical Journal, Volume 148, Issue 1, article id. 13, 28 pp. (2014).

- WTS-2 b: a hot Jupiter orbiting near its tidal destruction radius around a K dwarf
  Birkby, J. L.; Cappetta, M.; Cruz, P.; et al.
  Monthly Notices of the Royal Astronomical Society, Volume 440, Issue 2, p.1470-1489(2014).

- Cataclysmic variables from the Catalina Real-time Transient Survey
  Drake, A. J.; Gänsicke, B. T.; Djorgovski, S. G.; et al.
  Monthly Notices of the Royal Astronomical Society, Volume 441, Issue 2, p.1186-1200 (2014).

- Chasing the Identification of ASCA Galactic Objects (ChIcAGO): An X-Ray Survey of Unidentified Sources in the Galactic Plane. I. Source Sample and Initial Results
  Anderson, Gemma E.; Gaensler, B. M.; Kaplan, David L.; et al.
  The Astrophysical Journal Supplement, Volume 212, Issue 1, article id. 13, 35 pp. (2014).

- CoRoT 105906206: a short-period and totally eclipsing binary with a δ Scuti type pulsator
  da Silva, R.; Maceroni, C.; Gandolfi, D.; et al.
  Astronomy & Astrophysics, Volume 565, id.A55, 11 pp. (2014).

- The 12CO/13CO ratio in AGB stars of different chemical type. Connection to the 12C/13C ratio and the evolution along the AGB
  Ramstedt, S. & Olofsson, H.
  Astronomy & Astrophysics, Volume 566, id.A145, 17 pp. (2014).

- The rapid evolution of the exciting star of the Stingray nebula
  Reindl, N.; Rauch, T.; Parthasarathy, M.; et al.
  Astronomy & Astrophysics, Volume 565, id.A40, 14 pp. (2014).

- WINGS-SPE. III. Equivalent width measurements, spectral properties, and evolution of local cluster galaxies
  Fritz, J.; Poggianti, B. M.; Cava, A.; et al.
  Astronomy & Astrophysics, Volume 566, id.A32, 21 pp. (2014).

- Physical properties and evolutionary state of the Lyman alpha emitting starburst galaxy IRAS 08339+6517
  Otí-Floranes, H.; Mas-Hesse, J. M.; Jiménez-Bailón, E.; et al.
  Astronomy & Astrophysics, Volume 566, id.A38, 17 pp. (2014).

- Stellar laboratories. II. New Zn iv and Zn v oscillator strengths and their validation in the hot white dwarfs G191-B2B and RE 0503-289
  Rauch, T.; Werner, K.; Quinet, P.; & Kruk, J. W.
  Astronomy & Astrophysics, Volume 564, id.A41, 8 pp. (2014).

- IPHAS and the symbiotic stars. III. New discoveries and their IR spectral energy distributions
  Rodríguez-Flores, E. R.; Corradi, R. L. M.; Mampaso, A.; et al.
  Astronomy & Astrophysics, Volume 567, id.A49, 13 pp. (2014).

- Dwarf Galaxies in the Halo of NGC 891
  Schulz, Earl
  The Astrophysical Journal, Volume 790, Issue 1, article id. 76, 13 pp. (2014).

- The Disk around the Brown Dwarf KPNO Tau 3
  Broekhoven-Fiene, Hannah; Matthews, Brenda; Duchêne, Gaspard; et al.
  The Astrophysical Journal, Volume 789, Issue 2, article id. 155, 6 pp. (2014).

- Search for Bright Nearby M Dwarfs with Virtual Observatory Tools
  Aberasturi, M.; Caballero, J. A.; Montesinos, B.; et al.
  The Astronomical Journal, Volume 148, Issue 2, article id. 36, 13 pp. (2014).

- Physical and dynamical properties of the main belt triple Asteroid (87) Sylvia
  Berthier, J.; Vachier, F.; Marchis, F.; et al.
  Icarus, Volume 239, p. 118-130 (2014).

- Distribution of CCS and HC3N in L1147, an Early Phase Dark Cloud
  Suzuki, Taiki; Ohishi, Masatoshi; & Hirota, Tomoya
  The Astrophysical Journal, Volume 788, Issue 2, article id. 108, 10 pp. (2014).

More Ways to Find VO-related Publications

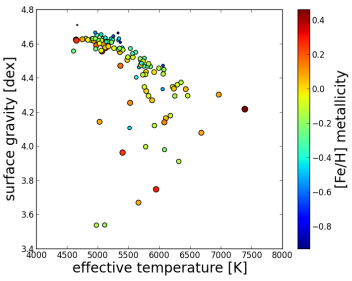
The ADS query we manually curate for the bibliography in this newletter.

All ADS links mentioning the "virtual observatory" in the abstract.

All refereed publications mentioning the "virtual observatory" in the abstract.

NEW VO TUTORIALS OR OUTREACH MATERIALS

Using Virtual Observatory with Python: querying remote astronomical databases This tutorial is devoted to extending an existing catalogue with data taken elsewhere, either from CDS Vizier or Simbad database. As an example, we used the so-called 'Spectroscopic Survey of Stars in the Solar Neighborhood' (aka. S4N, Allende Prieto et al. 2004) in order to retrieve all objects with available data for the set of fundamental stellar parameters effective temperature, surface gravity and metallicity. Then for each object in this dataset we query Simbad database to retrieve the projected rotational velocity. This combines Vizier and Simbad queries made using Python astroquery module. The tutorial covers remote database access, filtering tables with arbitrary criteria, creating and writing your own tables, and basics of plotting in Python.



More information: http://arxiv.org/abs/1408.7026 and tutorial webpage

---

VO CALENDAR

5-9 October 2014 - ADASS XXIV
Calgary, Alberta, Canada
This annual conference, held in a different location each year, is a forum for scientists, developers and

programmers working in areas related to algorithms, software and systems for the acquisition, reduction, analysis, and dissemination of astronomical data.

10-12 October 2014 - IVOA Interoperability Meeting
Canadian Astronomy Data Centre, Banff, Alberta, Canada
The International Virtual Observatory Alliance (IVOA) semi-annual Interoperability meetings provide for discussion and development of virtual observatory standards and VO-based applications, and are open to those with an interest in utilizing the VO infrastructure and tools in support of observatory operations and/or astronomical research.

3-5 November 2014 - Big Data Across Disciplines: In Search of Symbiosis
Groningen, Netherlands
The second Target conference will bring together Big Data specialists, ICT researchers, e-scientists and traditional scientists from a variety of disciplines who will explore differences and commonalities in their approach to the three main stages in the Big data lifecycle.

12-14 November 2014 - 2014 Conference on Big Data from Space (BiDS '14)
ESRIN, Frascati, Italy
This conference aims to bring together researchers, engineers, users in the area of Big Data in the Space sector. The focus is on the whole data lifecycle, ranging from data acquisition by spaceborne and ground-based sensors to data management, analysis and exploitation in the domains of Earth Observation, Space Science, Space Engineering, Space Weather, etc.

8-10 December 2014 - .Astronomy 6
Adler Planetarium, Chicago, Illinois, USA
.Astronomy (pronounced 'dot-astronomy') aims to bring together an international community of astronomy researchers, developers, educators and communicators to showcase and build web-based projects, from outreach and education to research tools and data analysis.

20-12 April 2015 - Hubble 2020: Building on 25 Years of Discovery
Space Telescope Science Institute · Baltimore, Maryland, USA
With an eye towards the future, this symposium will celebrate the extraordinary impact that the Hubble Space Telescope has had on science, culture, and public engagement.

12-15 May 2015 - Hot-wiring the Transient Universe IV
Santa Barbara, California, USA
Hot-wiring the Transient Universe IV will explore opportunities and challenges of massively parallel time domain surveys coupled with rapid coordinated multi-wavelength follow-up observations. The interdisciplinary agenda includes future and ongoing science investigations, information infrastructure for publishing observations in real time, as well as novel data science to classify events and systems to optimize follow-up campaigns.