

IVOA Newsletter - January 2019

[Subscribe](#) | [Newsletter archives](#) | [Write to the editors](#)

IVOA Newsletter Editors: Deborah Baines, Bruce Berriman, Jamie Anne Budynkiewicz, Theresa Dower, Giulia lafrate, Shanshan Li, Simon O'Toole, Yihan Tao.

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



College Park IVOA Interoperability Meeting

The Northern Fall IVOA Interoperability Meeting was held on November 8-10, 2018 in College Park, Maryland, USA, supported by the NASA Astronomical Virtual Observatories (NAVO) and the US Virtual Observatory Alliance (USVOA). There were 109 registered participants who gathered for two and a half days of productive discussions.

The Working Group and Interest Group sessions covered scientific and technological aspects of interoperability of astronomy data and services. Many presentations reported on practical implementations of IVOA standards, showing results and providing feedback. Progress was reported on the 'Time

Domain' priority area. A number of contributions focussed on emerging needs of the astronomy community such as standards to support multi-messenger astronomy, and improving the access to VO resources via python language tools. Other topics included the status of operations in 'VO weather reports' and the use of Digital Object Identifiers (DOIs) for data and queries.

As usual for 'IVOA Interops' held at this time of year, the meeting was connected to the ADASS conference. For a change, and partly due to a local football match, this Interop was held before ADASS. VO topics were prominent at ADASS, including two hands-on tutorials on the use of VO technologies (see under "Schools and Workshops"), an invited talk on Time Domain Astronomy by the IVOA Time Domain Interest Group chair, a talk on 'Astropy and the VO' and various demonstration booths highlighting VO access to data.

Warm thanks to the local organisers lead by NAVO and USVOA! Mark your calendars for the next IVOA Interoperability Meeting in Paris, France, May 12-17, 2019.

More information: <https://wiki.ivoa.net/twiki/bin/view/IVOA/InterOpNov2018MeetingPage>

SCHOOLS AND WORKSHOPS

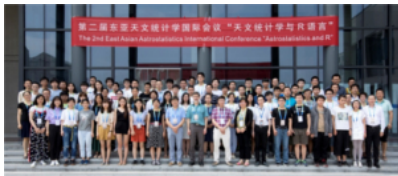
Fourth ASTERICS Virtual Observatory School

The ASTERICS project held its fourth VO school at the Centre de Données astronomiques de Strasbourg (CDS) in Strasbourg on 20-22 November 2018. The goal of the school was twofold: (1) to expose European astronomers and representatives of the ESFRI projects involved in ASTERICS to the variety of VO tools and services available today so that they can use them efficiently for their own research, and (2) to gather requirements and feedback from participants.

During the first two days, VO experts gave hands-on sessions on the usage of VO tools and services using real life examples of scientific applications, which allowed participants to become fully familiar with the VO capabilities on their own laptops. The last day was then dedicated to the participants own science cases, applying what they had learnt earlier in the week.



More information can be found [here](#)



The 2nd East Asian Workshop on Astrostatistics hosted by the China-VO

On July 9-13, 2018 in Nanjing , and on July 16-20, 2018 in Guiyang, the 2nd East Asian Workshop on Astrostatistics was organized by the East Asian Core Observatories Association and hosted by the China-VO (NAOC), Purple Mountain Observatory, and Guizhou Normal University. A total of 129 participants from 28 astronomical research institutes of China, Japan, Vietnam and Mongolia attended the workshop. Prof. Eric Feigelson from Penn State University was the instructor of the workshop. During the workshop, Prof. Feigelson covered the topics of density estimation and local regression, statistical inference, regression, multivariate clustering & classification, Bayesian inference, time series analysis, good statistical practices in astronomy, etc. and illustrated by code examples in R.

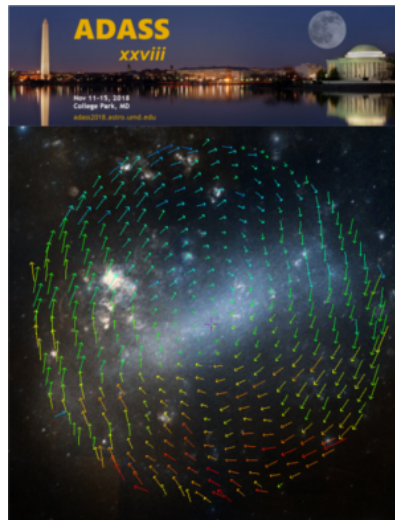
Tutorials during ADASS 2018

Two VO-related tutorials were given on Sunday, 11 November 2018 during the last ADASS meeting in College Park, USA. During each of the 2 hours session, participants familiarized themselves with different VO standards and tools.

In Tutorial T1, "All-sky astronomy with HiPS and MOCs" conducted by Sebastien Derriere, the goal was to create image and catalogue HiPS, learn how to compare them to reference datasets, and share them in a web page. Advanced usage with the Table Access Protocol and the Astropy/MOCpy libraries was also shown.

In Tutorial T3, "A comprehensive use case scenario of VO standards and protocols" conducted by Hendrik Heintz, participants were introduced to the usage of some VO standards and how one can remotely crossmatch between different services and surveys. This was applied to identifying brown dwarves in 2MASS and SDSS.

More information can be found [here](#)



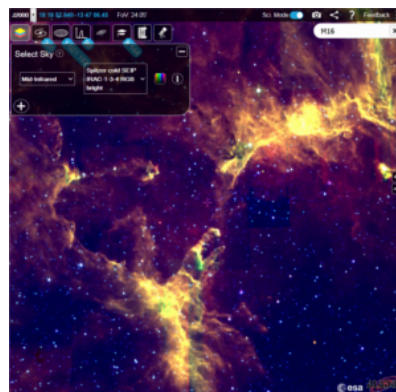
Access more scientific usage tutorials [here](#)

VO APPLICATIONS AND IMPLEMENTATION HIGHLIGHTS

ESASky v3.0

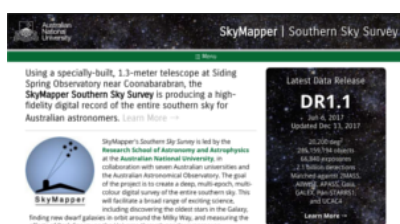
We are pleased to announce the release of ESASky version 3.0, with significant improvements to the user interface. It now integrates a switch allowing users to change between two different modes, "Science" and "Explorer", depending on their level of expertise and their intended use of the tool.

This version features an improved Solar System Object (SSO) search functionality, with refined cross-matches and new objects, allowing fast discovery of photometry observations from ESA missions that potentially contain SSOs within their field of view. It also enables the easy lookup of any location in NED, SIMBAD, Vizier, the Vizier Photometry viewer service and the World Wide Telescope (WWT), a sky exploration tool from the American Astronomical Society (AAS). Furthermore, the ESASky collection of Hierarchical Progressive Survey (HiPS) maps is enlarged with the addition of nine Spitzer/IRAC HiPS generated by the ESDC, in collaboration with the Spitzer Science Center in Caltech (USA).



ESASky is a science driven discovery portal developed at the ESAC Science Data Centre (ESDC) for exploration and discovery of data hosted by the ESA astronomical archives and archives from other data providers.

For more information see [here](#) and <https://sky.esa.int>



SkyMapper VO Services

The SkyMapper node of the All-Sky Virtual Observatory (ASVO), the network of federated datasets from Australian astronomical facilities, is providing access to data from the SkyMapper Southern Survey, which aims to create the most comprehensive digital imaging survey of the Southern sky.

Data access is available through web forms on the SkyMapper website (<http://skymapper.anu.edu.au>) or through IVOA-compliant tools such as TOPCAT or Aladin. The available survey data products include image cutouts, position-based object searches, a spectrum viewer, and complex

survey data products include image cutouts, position-based object searches, a spectrum viewer, and complex

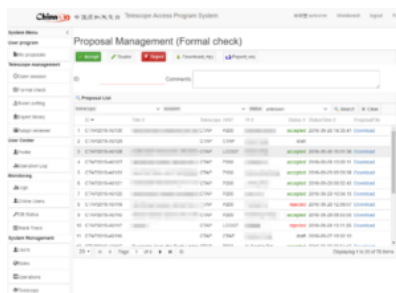
queries of the catalogue. The SkyMapper website hosts a Sky Viewer to interactively explore the sky as well as a user forum to discuss findings and share information.

The first data release covers more than 98% of the Southern Sky to ~ 18 ABmag in u,v,g,r,i,z filters, with future releases expanding the dataset in both depth and area.

More information: <http://skymapper.anu.edu.au>

Telescope Access Program proposal submission and data archiving supported by the China-VO

The Telescope Access Program is a program to provide astronomers based in China direct access to competitive instrumentation on intermediate- and large-aperture optical/infrared telescopes outside of China. Supported telescopes include the Canada-France-Hawaii Telescope (3.6m) for 4-7 nights during February 2019 to July 2019; the Palomar Hale Telescope (5.1m, P200) for 22 nights during February 2019 to July 2019; the Las Cumbres Observatory (1m network) for 200 hours during December 2018 to May 2019; and the Las Cumbres Observatory (LCO) telescopes. The China-VO began to support proposal submission and data archiving of the Telescope Access Program since September 2018 and 48 proposals were collected for Semester 2019A.



More information can be found [here](#)

SOME RECENT PAPERS ABOUT VO-ENABLED SCIENCE

Featured Science Publication

Three Hypervelocity White Dwarfs in Gaia DR2: Evidence for Dynamically Driven Double-degenerate Double-detonation Type Ia Supernovae

Shen, Ken J.; Boubert, Douglas; Gänsicke, Boris T.; Jha, Saurabh W.; Andrews, Jennifer E.; Chomiuk, Laura; Foley, Ryan J.; Fraser, Morgan; Gromadzki, Mariusz; Guillochon, James; Kotze, Marissa M.; Maguire, Kate; Siebert, Matthew R.; Smith, Nathan; Strader, Jay; Badenes, Carles; Kerzendorf, Wolfgang E.; Koester, Detlev; Kromer, Markus; Miles, Broxton Pakmor, Rüdiger; Schwab, Josiah; Toloza, Odette; Toonen, Silvia; Townsley, Dean M.; Williams, Brian J.

ApJ (2018) Volume 609, A10

Double detonations in double white dwarf (WD) binaries undergoing unstable mass transfer have emerged in recent years as one of the most promising Type Ia supernova (SN Ia) progenitor scenarios. One potential outcome of this “dynamically driven double-degenerate double-detonation” (D^6) scenario is that the companion WD survives the explosion and is flung away with a velocity equal to its $>1000 \text{ km s}^{-1}$ pre-SN orbital velocity. We perform a search for these hypervelocity runaway WDs using Gaia’s second data release. In this paper, we discuss seven candidates followed up with ground-based instruments. Three sources are likely to be some of the fastest known stars in the Milky Way, with total Galactocentric velocities between 1000 and 3000 km s^{-1} , and are consistent with having previously been companion WDs in pre-SN Ia systems. However, although the radial velocity of one of the stars is $>1000 \text{ km s}^{-1}$, the radial velocities of the other two stars are puzzlingly consistent with 0. The combined five-parameter astrometric solutions from Gaia and radial velocities from follow-up spectra yield tentative D^6 confirmation of the D^6 scenario. The past position of one of these stars places it within a faint, old SN remnant, further strengthening the interpretation of these candidates as hypervelocity runaways from binary systems that underwent SNe Ia.

DOI: [10.3847/1538-4357/aad55b](https://doi.org/10.3847/1538-4357/aad55b)

Refereed Publications

The full list of refereed publications from August 2018 to January 2019 can be found at the following [list](#), curated by the Spanish Virtual Observatory.

More Ways to Find VO-related Publications

All [ADS links](#) mentioning the “virtual observatory” in the abstract.

All [refereed publications](#) mentioning the “virtual observatory” in the abstract.

VO CALENDAR

6-10 January 2019 - 233rd AAS Meeting

Seattle, WA, USA

The American Astronomical Society (AAS) meetings serve as a venue for the general astronomical community to gather and discuss the latest science, tools, and technologies in astronomy. At the 233rd AAS Meeting, there will be a couple of VO-related sessions and exhibits, including presentations from international VO partners, open to all astronomers. On Saturday 5th January at 10:00 am, PST, NASA Astronomical Virtual Observatories will be leading a workshop on accessing the NASA astrophysical archives via Python tools. On Monday 7th January, the USVOA will be holding an open meeting from 2:00-3:30pm, during which the latest US-based VO efforts will be presented by partner institutes, new demos shown, and current/future VO tasks discussed. IVOA affiliated institutions will have booths in the exhibition hall throughout the week, demonstrating tools and services such as the NASA Astrophysics Data System, SciServer, VizieR, and other VO data access interfaces. Attendees may

learn more about the data and services provided by those institutions, and have face-to-face discussions with developers.

19-21 February 2019 - 2019 Conference on Big Data from Space (BiDS'19)

Alte Kongresshalle, Munich, Germany

Big Data from Space refers to the massive spatio-temporal Earth and Space observation data collected by a variety of sensors - ranging from ground based to space-borne - and the synergetic use of data coming from other sources and communities. This domain is currently facing sharp development with numerous new initiatives and breakthroughs from intelligent sensors' networks to data science application. These developments are empowering new approaches and applications in various and diverse domains influencing life on earth and societal aspects, from sensing cities, monitoring human settlements and urban areas to climate change and security. The focus of the meeting is turning data into insights. This is a large meeting with oral sessions, poster sessions, demos and exhibitions. Conference proceedings will be a Special Issue IEEE Transactions on Big Data (TBC). BiDS'19 is coorganized by the European Space Agency with the EC JRC, EU SatCen and is hosted by DLR.

12-17 May 2019 - IVOA Interoperability Meeting

Paris, France

The International Virtual Observatory Alliance (IVOA) semi-annual Interoperability meetings provide an opportunity 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. The Northern Spring 2019 IVOA Interoperability meeting will be held at the Observatoire de Paris, Paris, France, and will be hosted by the French VO.

17-21 June 2019 - Astroinformatics 2019

Caltech, CA, USA

Astroinformatics 2019 aspires to continue the successful series of meetings that attract researchers engaged in the processing of astronomical data using modern computational methods. Topics of interest include: e-science infrastructures; data-mining & knowledge discovery; visualization & data exploration; database systems & data intense projects; survey & time-domain astronomy. Equal emphasis is placed on the presentation of novel statistical processing methods as well as astronomical topics. The scientific exchange between the astronomical and computational worlds is the focus of the event.

30 September - 4 October 2019 - .Astronomy 11

Toronto, Canada

The .Astronomy conference series aims to build a dynamic and creative community of scientists and educators to exploit the potential offered by modern computing and the internet in the era of data-driven astronomy. Rather than scientific questions, the focus is on innovative use of the web to develop new research tools, and to communicate with a broad audience through online platforms and innovative engagement resources. .Astronomy provides scientists, developers and science communicators an opportunity to showcase their ideas and skills outside their institutes or research areas, and help them get credit for their work.

6-10 October 2019 - ADASS XXIX

Groningen, The Netherlands

This annual Astronomical Data Analysis Software and Systems (ADASS) conference, held in a different location each year, is a forum for astronomers, computer scientists, software engineers, faculty members and students working in areas related to algorithms, software and systems for the acquisition, reduction, analysis, and dissemination of astronomical data. The ADASS XXIX program will include invited talks, contributed papers, display sessions, tutorials, computer demonstrations, and special interest ("Birds of a Feather" or BoF) meetings.

11-13 October 2019 - IVOA Interoperability Meeting

Groningen, The Netherlands

The International Virtual Observatory Alliance (IVOA) semi-annual Interoperability meetings provide an opportunity 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. The Northern Fall 2019 IVOA Interoperability meeting will be held in Groningen, The Netherlands and will be hosted by ASTRON.



For Astronomers



Getting Started / Using the VO
VO Glossary / VO Applications
IVOA newsletter / VO for Students
& Public
❖❖❖

For Deployers/Developers



Intro to VO Concepts /
IVOA Standards/ Guide to
Publishing in the VO / Technical
Glossary
❖❖❖

For Members



IVOA Calendar / Working Groups/
Twiki / Documents in Progress /
Mailing Lists / IVOA Roadmap
❖❖❖