

The Virtual Observatory

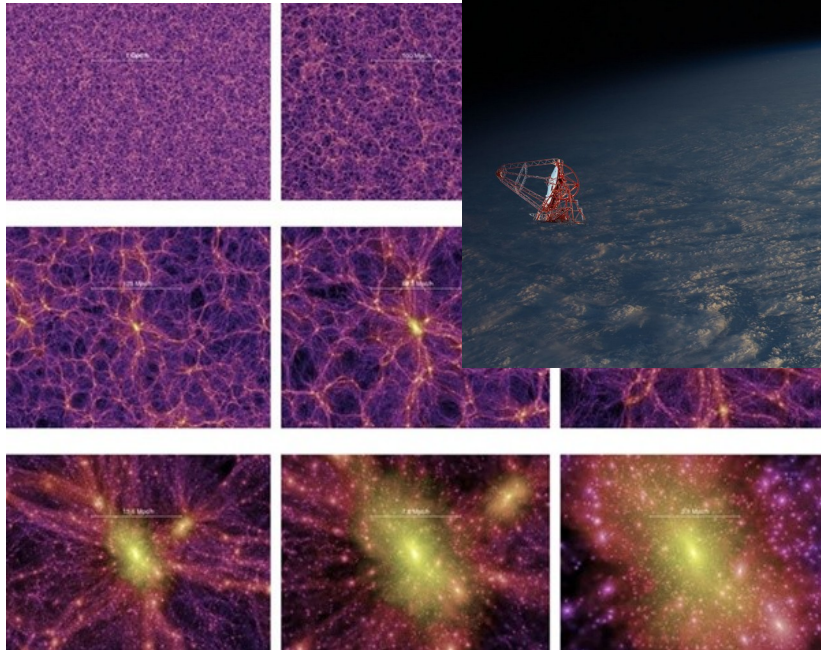
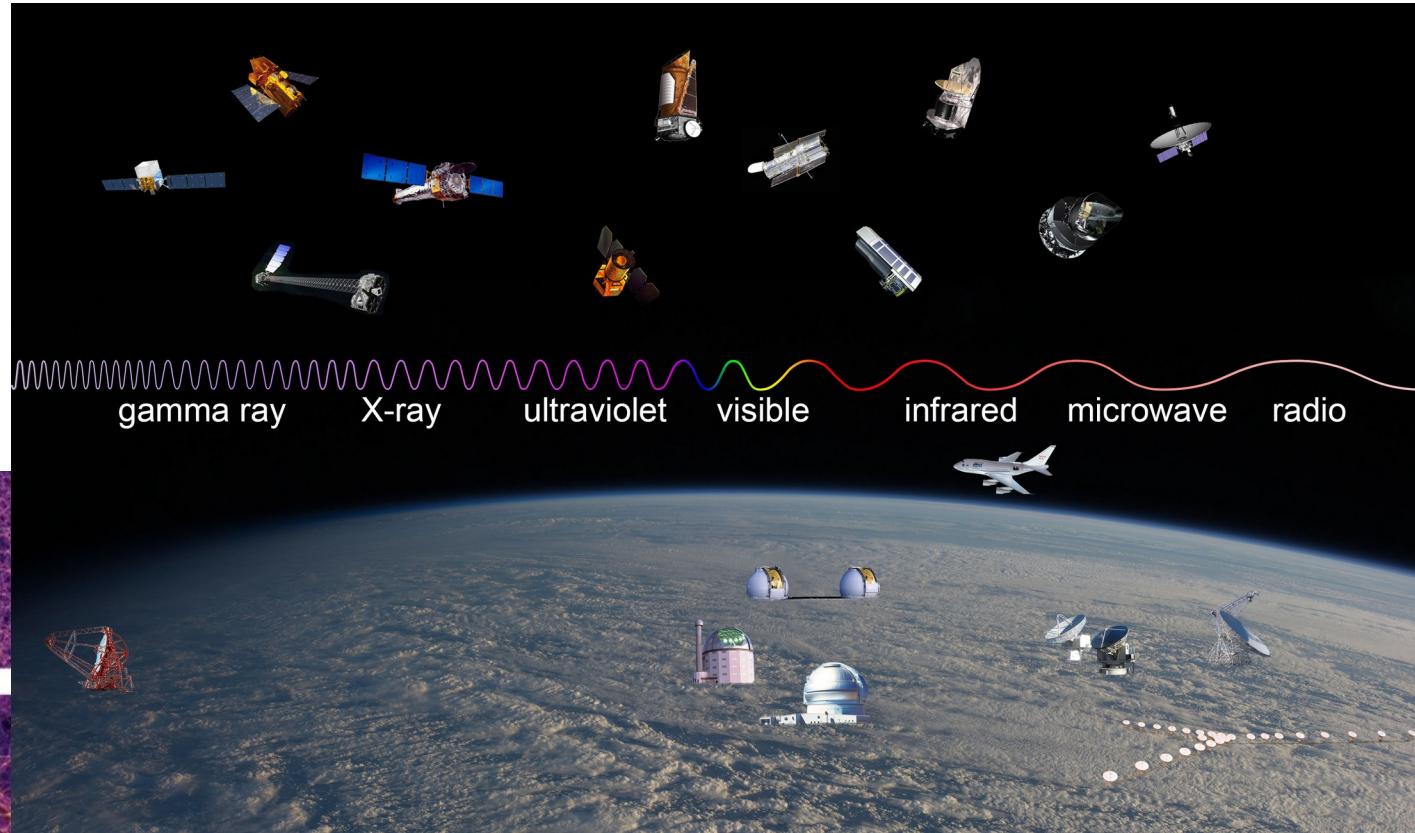
Enrique Solano



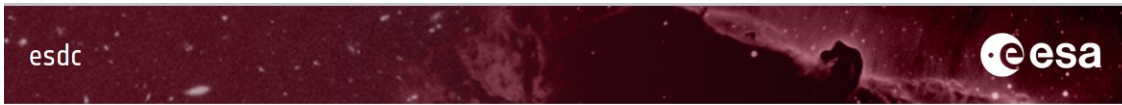
CENTRO DE ASTROBIOLOGÍA



Data! Data! Data!



Astronomical archives



ESDC » Home

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ESAC SCIENCE DATA CENTRE

ESDC Statistics

<p>Monthly Users (*)</p> <p>16 879</p>	<p>Monthly Downloaded (*)</p> <p>101. TB</p>	<p>Archive Total Size</p> <p>662.2 TB</p>
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* Monthly averages in 2021

LATEST NEWS

Tweets by @ESAesdc

ESA ESDC Retweeted

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Explora en Español el cosmos desde tu

Astronomy Science Archives

cheops	esasky	
gaia	herschel	

Mikuluski Archive for Space Telescopes
 The Mikuluski Archive for Space Telescopes is an astronomical data archive focused on data from over a dozen missions like Hubble, Kepler,

On This Page

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Missions



Hubble



Webb



TESS



See All of MAST's Missions and Data

European Southern Observatory

ESO — Reaching New Heights in Astronomy

Public Science User Portal Intranet

Science Users Information > Science Archive Facility

02 Sep 2021

Science Archive Facility

Welcome to the ESO Science Archive Facility

The ESO Science Archive Facility contains data from ESO telescopes at La Silla Paranal Observatory, including the APEX submillimeter telescope on Llano de Chajnantor. In addition, the raw UKIDSS/WFCAM data obtained at the UK Infrared Telescope facility in Hawaii are available.

The Principal Investigators of successful proposals for time on ESO telescopes have exclusive access to their scientific data for the duration of a proprietary period, normally of one year, after which the data becomes available to the community at large. Please read the [ESO Data Access Policy](#) statement for more information, along with the [relevant FAQs](#).

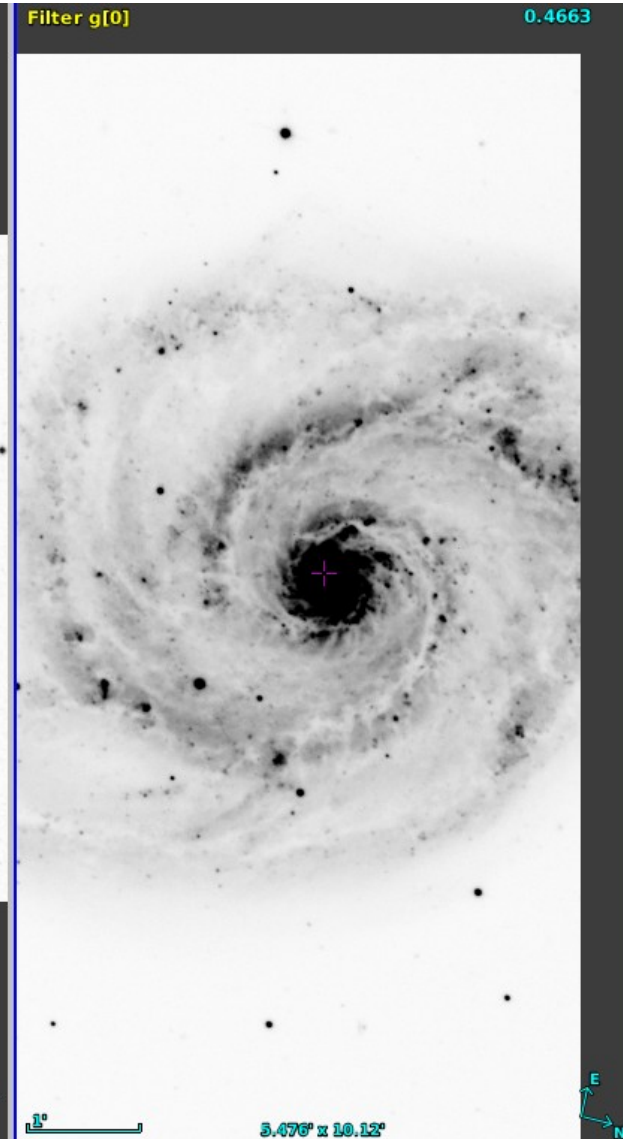
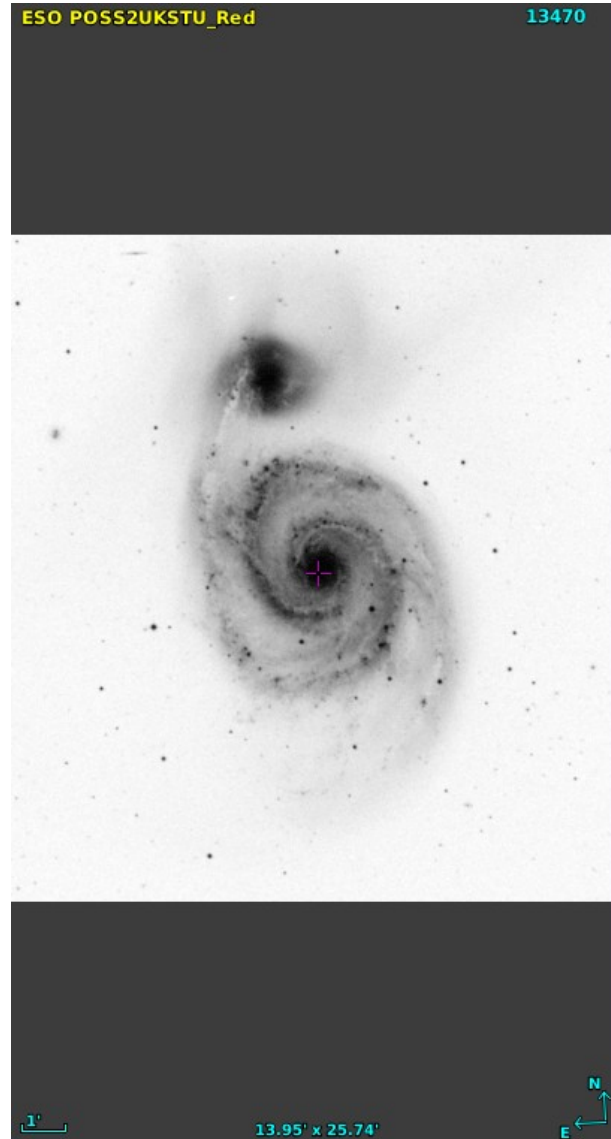
Browsing the archive does not require authentication. Please [acknowledge the use of archive data](#) in any publication.

There are three main ways to access the archive, varying for content and presentation/interface: the usual Raw Data query form, the innovative Science Portal to browse and access the processed data, and the novel Programmatic and Tools access which permits direct database access to both raw and processed data, and to the ambient condition measurements, also in a scriptable and VO manner. Other query forms are available in the table at the bottom of this page.

Raw Data	Science Portal Processed Data	Catalogue Facility Catalogue Data
Programmatic Raw, Processed, Catalogue, and Ambient Data		Community Forum Share ideas, ask questions, send feedback

Warning!
 Due to maintenance reasons, there may be a disruption of some archive services on the weekend of 4-5 September 2021. Full services won't be guaranteed before Monday 6th of September. We apologize for any inconvenience this may cause.

The problem: Interoperability



Multi- λ Astronomy

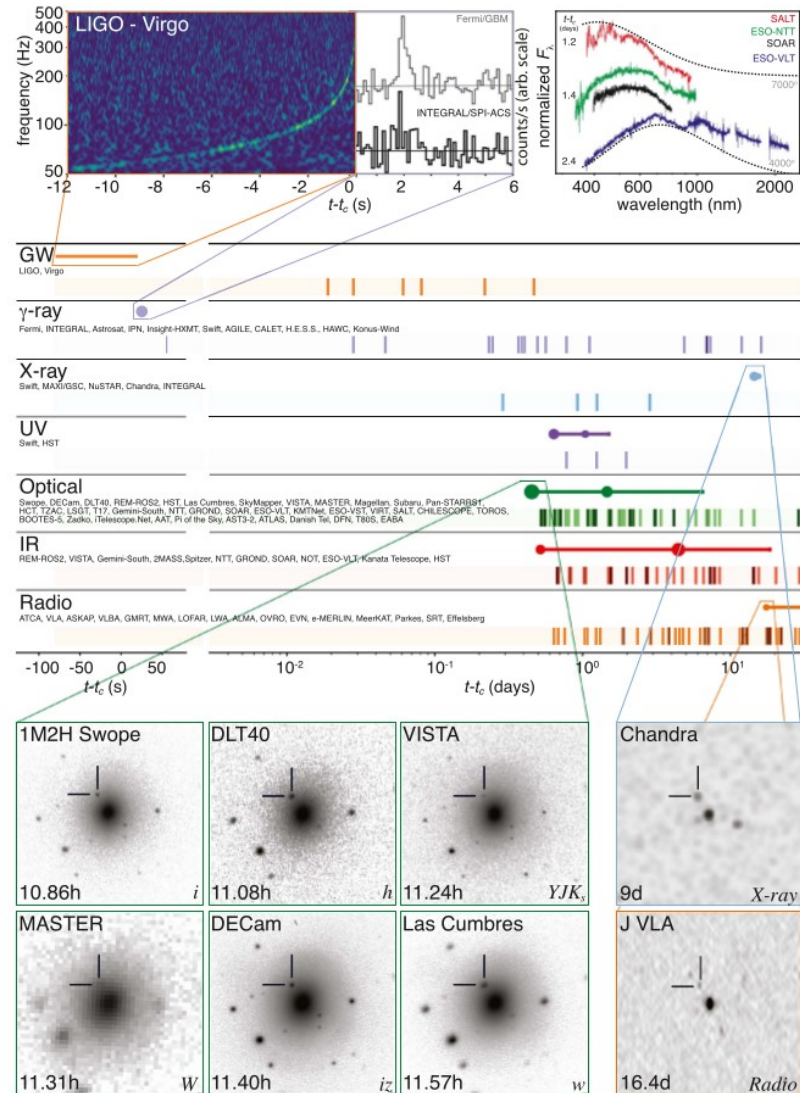


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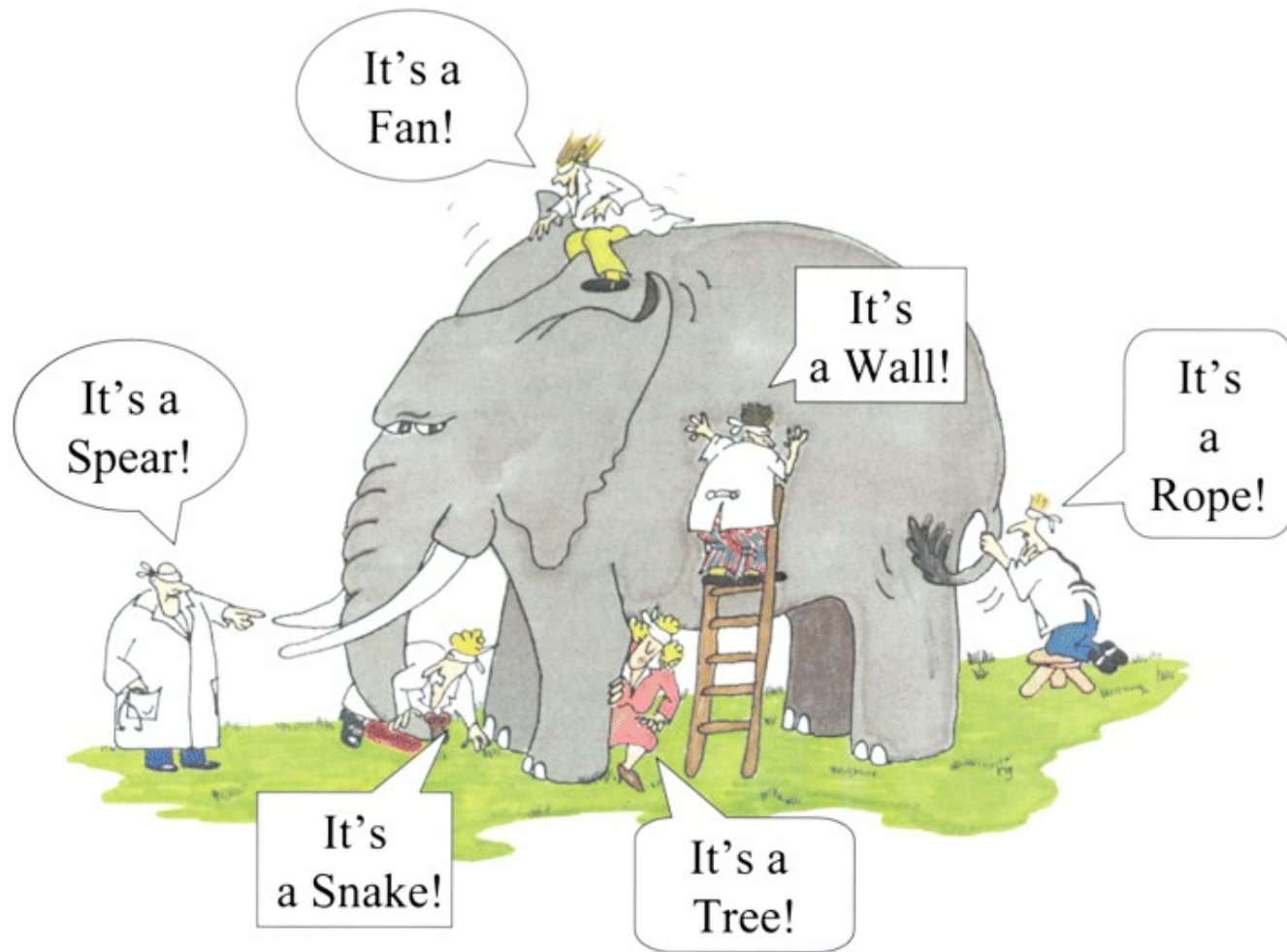
~ 4000 astronomers
~ 900 groups

THE ASTROPHYSICAL JOURNAL LETTERS, 848:L12 (59pp), 2017 October 20

Abbott et al.



Multi- λ Astronomy



Multi- λ Astronomy

THE ASTROPHYSICAL JOURNAL, 644: L75–L78, 2006 June 10
© 2006. The American Astronomical Society. All rights reserved. Printed in U.S.A.

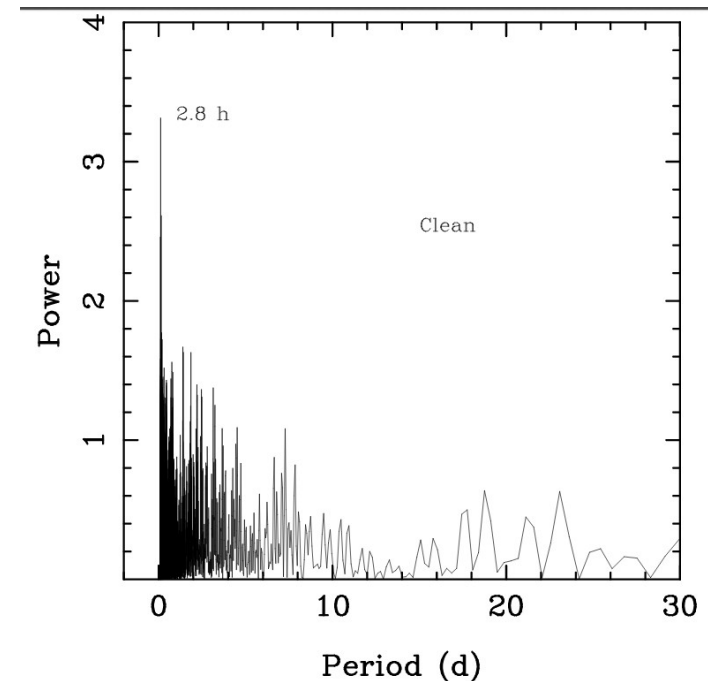
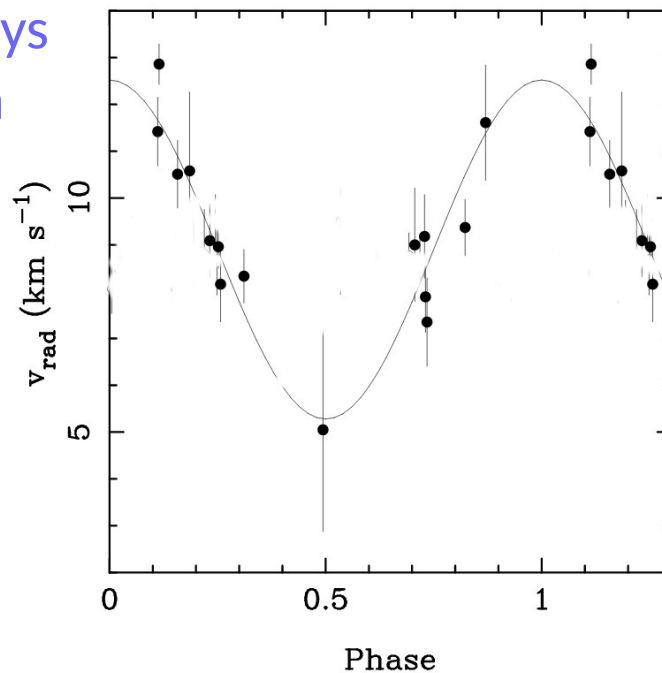
LP944-20

A MULTIWAVELENGTH RADIAL VELOCITY SEARCH FOR PLANETS AROUND THE BROWN DWARF LP 944-20

E. L. MARTÍN,^{1,2} E. GUENTHER,³ M. R. ZAPATERO OSORIO,⁴ H. BOUY,¹ AND R. WAINSCOAT⁵

Received 2006 April 10; accepted 2006 April 25; published 2006 May 26

- VLT/UVES
- 14 nights / 841 days
- Period: 2.5 – 3.7 h



Multi- λ Astronomy

THE ASTROPHYSICAL JOURNAL, 644: L75–L78, 2006 June 10

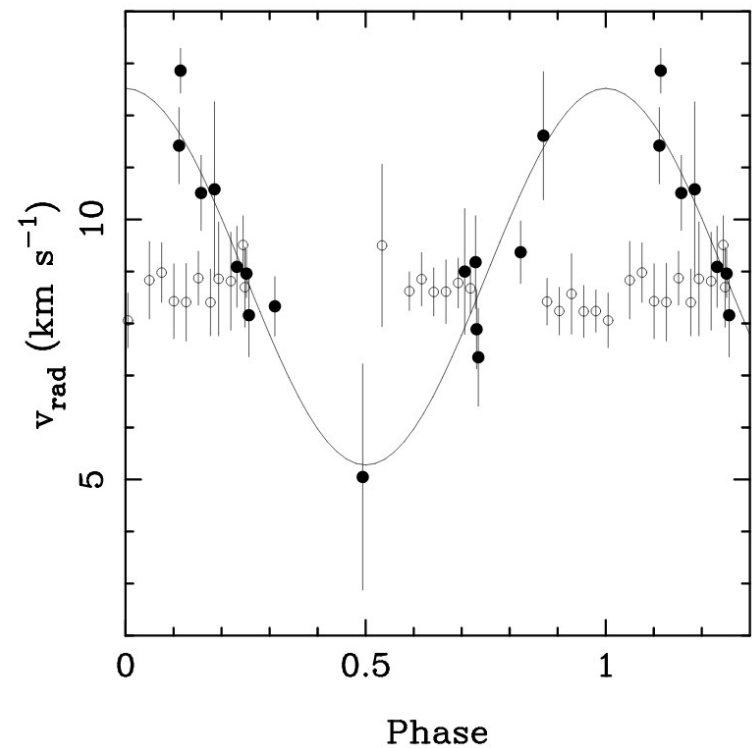
© 2006. The American Astronomical Society. All rights reserved. Printed in U.S.A.

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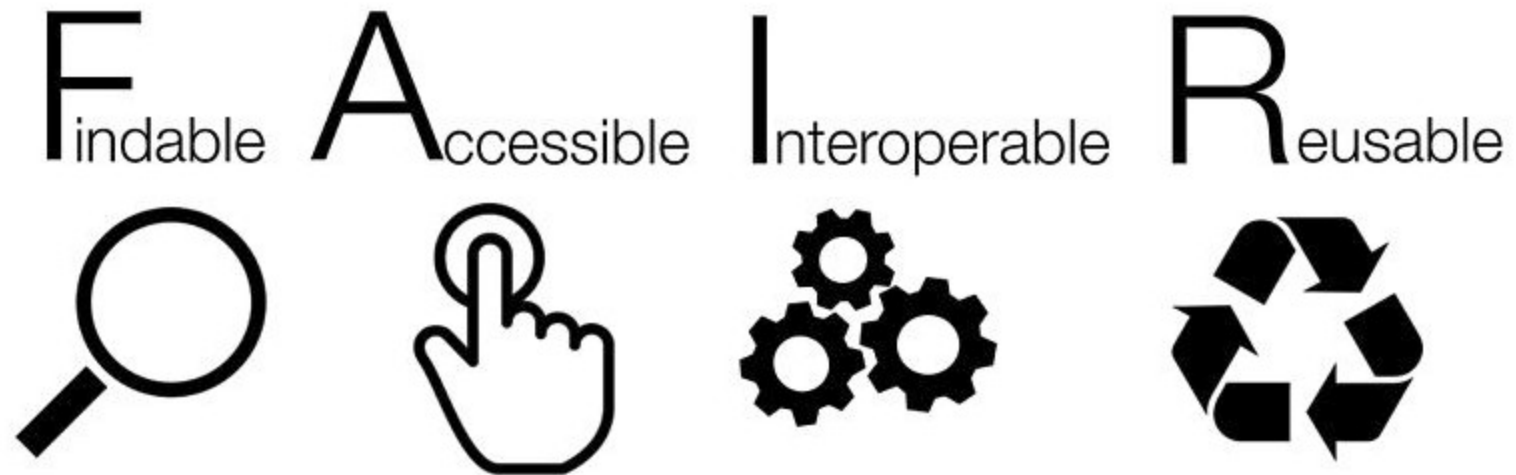
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Received 2006 April 10; accepted 2006 April 25; published 2006 May 26

- IR data rules out the planetary hypothesis.



The goal



Google is transparent. The VO goal is to achieve the same feeling for astronomical data.

The International Virtual Observatory Alliance

Virtual Observatories of the Future

Caltech campus, Pasadena, Calif., USA

June 13 - 16, 2000

<http://astro.caltech.edu/nvoconf>

Email inquiries: nvoconf@astro.caltech.edu

MPA/ ESO/ MPE Joint Astronomy Conference

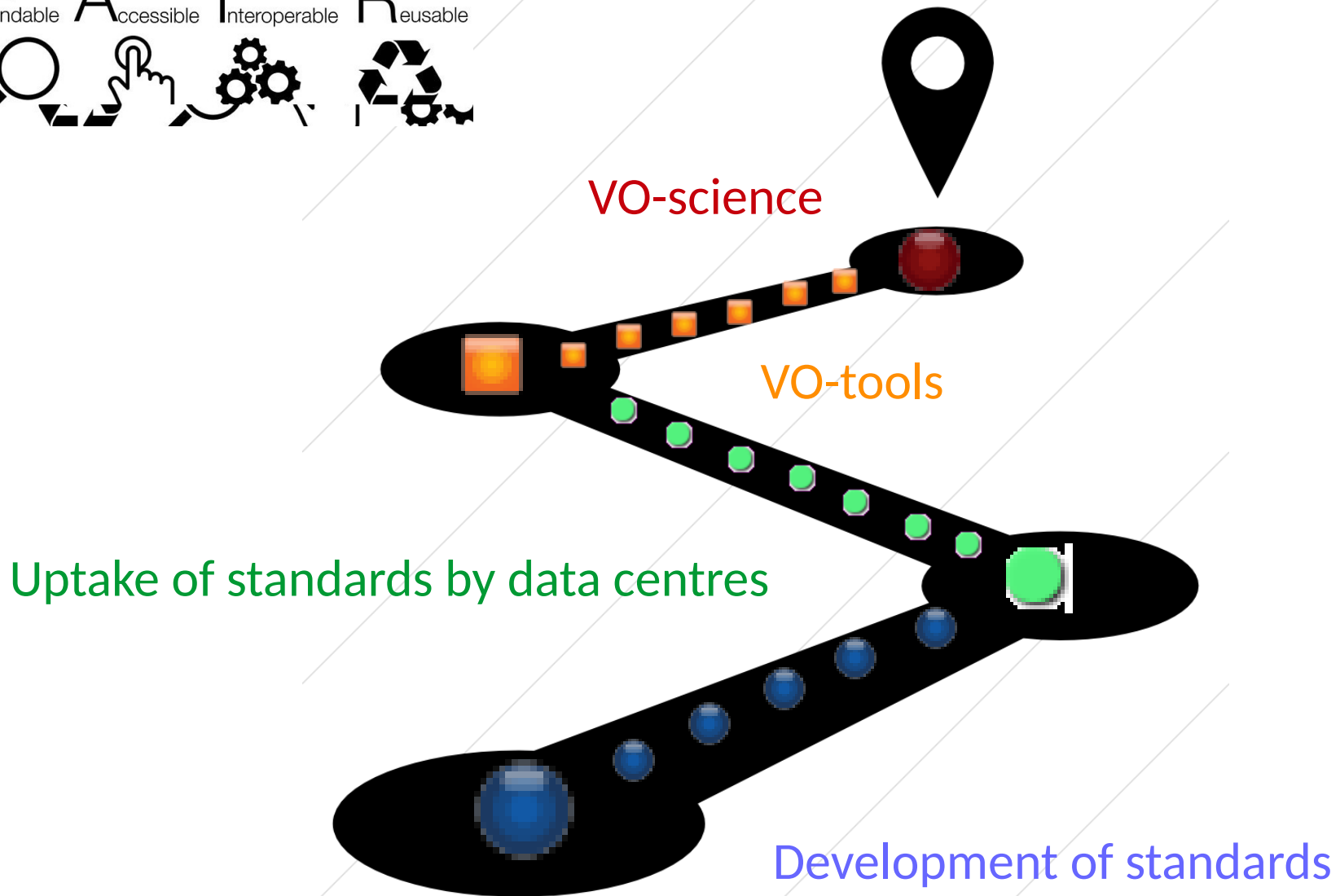
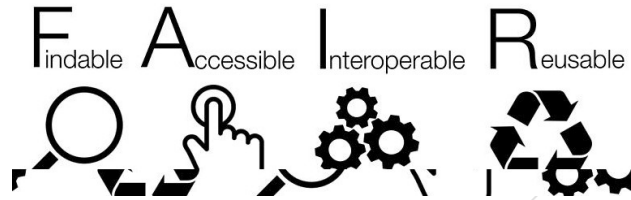
MINING THE SKY

July 31 - August 4, 2000

Garching, Germany



The Virtual Observatory roadmap



The power of VO: Aladin

The screenshot displays the Aladin v10.0 interface. The main window shows a star field with a central bright star and a red crosshair. Two white boxes with black text are overlaid on the image. The first box, located in the upper left, contains the text "Discovery of 1000s of archives / services" and has an arrow pointing to the "Available data" section of the left sidebar. The second box, located in the lower left, contains the text "Data available in the FoV → Green" and has an arrow pointing to a green star in the field. The left sidebar lists various data collections, with "Available data" showing 24028 in view and 24029 out view. The top menu bar includes File, Edit, Image, Catalog, Overlay, Coverage, Tool, View, Interop, and Help. The top right corner shows the Aladin logo and window controls. The bottom status bar indicates the software is distributed under GNU GPL v3.

Available data → 24028 / 24029
in view out view

Command: CDS/P/DSS2/color

Discovery of 1000s of archives / services

Data available in the FoV → Green

Available data: 24028 / 24029

in view out view

Collections → 24028

- Image → 477
- Gamma-ray → 23
- X → 23
- UV → 27
- Optical → 96
- Infrared → 179
- Radio → 67
- Gas-lines → 45
- X-ray → 1
- X-ray → 16
- Data base → 59
- Catalog → 22530
- VizieR → 21095
- I-Astrometric Data → 267
- I-Photometric Data → 346
- AllWISE Data Release (Cutri+2)
- The Pan-STARRS release 1 (PS)
- 2MASS All-Sky Catalog of Point Sources
- The ISO GAL Point Source Catalog
- Revised catalog of GALEX UV sources
- KIDS-ESO-DR3 multi-band sources
- AAVSO Photometric All Sky Survey
- WISE All-Sky Data Release (Cutri)
- GALEX-DR5 (GR5) sources from
- 2MASS 6X Point Source Worklist
- UKIDSS-DR9 LAS, GCS and DXS
- AKARI/IRC mid-IR all-sky Survey
- AKARI/FIS All-Sky Survey Point Sources
- SkyMapper Southern Sky Survey
- The VISTA Hemisphere Survey
- IRAS catalogue of Point Sources
- JMMC Stellar Diameters Catalog
- IRAS PSC/FSC Combined Catalog
- IRAS Faint Source Catalog, I+II
- GLIMPSE Source Catalog (I+II)
- The SDSS Photometric Catalog
- TASS Mark IV patches photometry
- Catalog of Infrared Observations
- IRAS Point Source Select Catalog
- General Catalogue of Photometry
- VPHAS+ DR2 survey (Drew+)
- XMM-OM Serendipitous Source Catalog
- VL T Survey Telescope ATLAS (ATLAS)
- UBV Photoelectric Catalog, data
- UBV Photometry of O & B Stars
- Palomar Transient Factory (PTF)
- Homogeneous Means in the UBV

select
from -- all collections --

0 sel / 0 src 34fps / 239MB

© 2017 Université de Strasbourg/CNRS - by CDS - Distributed under GNU GPL v3

The power of VO: Aladin

Aladin v10.0

File Edit Image Catalog Overlay Coverage Tool View Interop Help

Command [x] Frame ICRS Projection Spheric

Available data → 24028 / 24029
in view out view

- HST-wideV includes the following
 - GTC Public Archive
 - DECaLS → 4
 - DECaPS → 2
 - DES → 5
 - HSC → 2
 - IPHAS → 3
 - MAMA → 3
 - PanSTARRS → 6
 - PanSTARRS DR1 color (from b...
 - PanSTARRS DR1 g
 - PanSTARRS DR1 i
 - PanSTARRS DR1 r
 - PanSTARRS DR1 v
 - PanSTARRS DR1 z
 - J-PLUS-DR1 (July, 2018)
 - MINI-PAS-PDR201912 (December...
 - BASS → 2
 - DES DR1 LineA color
 - Swift → 6
 - UVOT → 6
 - Combined Swift UVOT counts: ba...
 - Combined Swift UVOT counts: ba...
 - Combined Swift UVOT exposure:...
 - Combined Swift UVOT exposure:...
 - Combined Swift UVOT intensities
 - Combined Swift UVOT intensities
 - Infrared → 179
 - Radio → 67
 - Gas-lines → 45
 - X-ray → 1
 - Swift → 1
 - XRT → 1
 - Combined Swift XRT exposure
 - X-ray → 16
 - Swift → 8
 - INTEGRAL → 4
 - INTEGRAL/IBIS 14-year 17-60keV
 - INTEGRAL/IBIS 9-year 17-35keV
 - INTEGRAL/IBIS 9-year 17-60keV
 - INTEGRAL/IBIS 9-year 35-80keV
 - XMM → 4
 - False color X-ray images (Red=0)
 - X-ray images on band 0.5-1KeV
 - X-ray images on band 1-2KeV
 - X-ray images on band 2-4.5KeV
 - Data base → 59
 - Catalog → 22530
 - VizieR → 21095

select
from -- all collections --

coll. view scan filter
grid study work north hidr multiview match

select pan dist phot draw tag mos spect filter crop cont pixel prop epoch size dens. opac. zoom

085 20421 = 01 96207 ICRS
05h40:49.97 -01:57:57.9
1.95° x 1.319°

0 sel / 0 src - 144fps / 639Mb

Interoperability (same orientation and scale).

Proyecto REDVO: Revisión de Estrellas Dobles Visuales Olvidadas

Su objetivo identificar y medir estrellas dobles visuales con separaciones mayores de 1" para las que sólo existe una medición histórica en el Catálogo de Estrellas Dobles de Washington (WDS). Mediante el uso del Observatorio Virtual (ALADIN) se procederá a visualizar dichas imágenes, identificar los pares, realizar la correspondiente astrometría relativa y determinar parámetros físicos de los pares confirmados con fotometría y movimientos propios del catálogo

Web del proyecto

Quien esté interesado en participar en este proyecto que se ponga en contacto con esm@cab.inta-csic.es

Proyecto SASDABA. Archivo espectroscópico de estrellas brillantes

El proyecto SASDABA busca la creación de un archivo de espectros de unas 2.000 estrellas brillantes (con magnitud $V < 5$). Este proyecto se convierte en un excelente recurso para docentes, estudiantes y aficionados que deseen realizar trabajos introductorios de espectroscopia estelar, así como estudios de los factores atmosféricos e instrumentales que afectan a las observaciones. SASDABA proporciona acceso a los datos de observación originales tal y como si la persona usuaria los hubiera obtenido desde el observatorio.

Web del proyecto

SVO Pro-Am

Enrique Solano



Spanish Virtual
Observatory



CENTRO DE ASTROBIOLOGÍA



EXCELENCIA
MARÍA
DE MAEZTU



Home Archives VO Science Tools and Services Big Data Education & Outreach Dissemination Help Desk Internal User Menu

Enseñando Astronomía con el Observatorio Virtual

Relación de casos prácticos

- Título: "El diagrama H-R del cúmulo de las Pléyades". (PDF) (OpenOffice)
- Título: "Distancia a Andrómeda". (PDF) (OpenOffice)
- Título: "Distancia a la Nebulosa del Cangrejo". (PDF) (OpenOffice)
- Título: "La Secuencia de Hubble". (PDF) (OpenOffice)
- Título: "Confirmación de una Supernova en la Galaxia NGC6946". (PDF) (OpenOffice)
- Título: "Movimiento propio de la estrella de Barnard". (PDF) (OpenOffice)

A continuación os mostramos dos imágenes. La imagen de la izquierda corresponde a la portada de uno de los casos propuestos mientras que la imagen de la derecha muestra la estrella de Barnard en dos épocas distintas utilizando la herramienta de análisis *Aladin*.



SVO Pro-Am

CENTRO ASTRONÓMICO DE CARTAGENA



Encuesta FAAE:

82% AMs no ha usado herramientas de VO

70% AMs interesado en participar en un taller formativo

48% interesado en imágenes

41% en fotometría

19% publicación de datos en VO

17% espectros

The school

- Since 2009. XX SVO school



- Expose participants to the variety of VO tools and services available today so that they can use them efficiently for their own research.
- Gather requirements and feedback from participants.



July 2020

MAXIMISING THE ACCESSIBILITY OF RESEARCH RESULTS IN THE FIGHT AGAINST COVID-19

Multi- λ Astronomy

We agree and endorse the principles below when dealing with research results stemming from EU funded research grants related to COVID-19 on prevention (including vaccines), testing and treatment:

- 1 Make the generated results, whether tangible or intangible, **public and accessible** without delay, for instance on the Horizon Results Platform, on an existing IP sharing platform, or through an existing patent pool.
- 2 Make scientific papers and research data available in **open access** without delay and following the FAIR principles via preprint servers or public repositories, with rights for others to build upon the publications and data and with access to the tools needed for their validation. In particular, make COVID-19 research data available through the European COVID-19 Data Platform.
- 3 Where possible, grant for a limited time³, **non-exclusive royalty free licences** on the intellectual property resulting from EU-funded research. These non-exclusive royalty free licenses shall be given in exchange for the licensees' commitment to rapidly and broadly distribute the resulting products and services under fair and reasonable conditions to prevent, diagnose, treat and contain COVID-19.



ISBN 978-92-76-20627-9, doi:10.2777/661122, K101-20-430-ENN

Final remarks

The FAIR principle is fulfilled in Astronomy thanks to the Virtual Observatory making reality what in other disciplines is just a dream.

HILL: I felt a little bit like I stepped into the future when I went to a meeting of the [virtual observatories](#) in astronomy. They've already done a lot of the things that we're aiming to do in the sense that they've got observatories from all around the world that are sharing, through a common infrastructure, the data that they're measuring. And they're integrating it into a unified picture of the sky and our universe. These same data contribute to building large-scale simulations of the universe. I think that's extremely inspiring. If we can have a common infrastructure that allows us to have a globally integrated view of the data being produced, and the tools to run large-scale simulations from the data, [we will really have made progress in neuroscience.](#)



Human Brain Project

Science ▾

Platforms ▾

Collaborate ▾

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Education & Training ▾

Welcome to the Human Brain Project

The Human Brain Project aims to put in place a cutting-edge research infrastructure that will allow scientific and industrial researchers to advance our knowledge in the fields of neuroscience, computing, and brain-related medicine

[Learn more about the project](#)