

VOV: teaching Virtual Observatory tools Virtually

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CENTRO DE ASTROBIOLOGÍA



Context: VO Schools

- ◆ The SVO group has been organizing VO schools since 2009
 - ◆ For whom?
 - New generations of astronomers to get familiar with VO tools from the early stages of their careers.
 - Amateur community, who has risen interest in the VO, giving birth to Pro-Am collaborations (p.e., REDVO project)

Context: VO Schools

- ◆ The SVO group has been organizing VO schools since 2009
 - ◆ Where?
 - Universities within their MSc program in Astrophysics but also in research centers and national meetings (both professional and amateur).
 - ◆ National VO schools: the SVO group brings the school to the research centers/institutes, maximizing attendance and minimizing costs
 - ◆ European VO schools organized within the different projects related with the Euro-VO project. A VO institution hosts the school

Context: VO schools

- ◆ The SVO group has been organizing VO schools since 2009
 - ◆ Why?
 - To teach participants on how to efficiently use the VO tools for their own research.
 - To gather feedback and requirements on VO tools and services.
 - ◆ How?
 - Methodology supported on tutorials based on real science cases.
 - Hands-on experience
 - Chance for the participants to present their own science cases and develop them during the school with an assigned tutor

Context: VO schools

- > 20 schools at national and european level since 2009.
- > 500 participants



Context: problematics

- ◆ There is an **increasing demand** of VO workshops from the professional and amateur communities but:
 - Travelling is not always possible, even without pandemic
 - Finding suitable dates and times for organizing schools becomes an issue, since amateurs have their own jobs → Weekends? Late hours?
- ◆ During the last six months, the COVID-19 disease has suddenly changed our lifestyles all around the globe:
 - **Teleworking** has become a reality for most of us
 - Schools, meetings and travels have been **postponed/cancelled**

Context: problematics

- ◆ There is an **increasing demand** of VO workshops from the professional and amateur communities but:
 - Travelling is not always possible, even without pandemic
 - Finding suitable dates and times for organizing schools becomes an issue, since amateurs
- Proposal as a first approximation solution:

remote workshops → VOV

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VOV. Where?

- ◆ At **Centro de Astrobiología (CAB, Madrid, Spain)**, certificated as an “Excelence María de Maeztu” center because of its impact and scientific leadership
- ◆ One of the "María de Maeztu" main goals is to **boost the training activities** at CAB by:
 - Disseminating science and technology
 - Facilitating transdisciplinary training
 - Promoting collaborations
 - Developing communication skills

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VO workshop

VOV. What?

- ◆ Pilot project developed taking advantage of the COVID-19 situation
- ◆ In the frame of the María de Maeztu Academy:
 - Weekly slots of one hour for “mini workshops”
 - Thought to be presented to the whole institute (astrophysicists, engineers, chemists, biologists...)
 - Zoom PRO account
 - In Spanish, also to reach the Latin American community
- ◆ VO tutorials based on tools instead of science cases → one hour, one tool

VOV. How?

Classical VO school	VOV workshop
Duration of the school: 1-3 days	<1 day
Science case explanation	Science case explanation
---	Examples to show other capabilities of the tool
Tutorial given to the participants	Tutorial given to the participants
2-3 hours/tutorial	1 hour/tutorial
Time to work on the tutorial	Tutorial conducted by the tutor
One or more VO tools per tutorial	One VO tool per tutorial
Participant's science case develop within the VO	---
In site advice from the tutors	Email contact for doubts during the off-line execution of the tutorial

VOV I. Aladin

◆ VOV I. Aladin

Aladin window

Step by step guide

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Detailed pdf tutorial

Available data

- Image → 409
- Gamma-ray → 23
- X-ray → 31
- UV → 27
- Optical → 100
- Infrared → 124
- Radio → 61
- Gas-lines → 43
- Data Base → 59
- Catalog → 20555
- VizieR → 21419
- archive.stsci.edu → 63
- irsa.ipac → 391
- nasa.heasarc → 939
- org.gavo.dc → 44
- Cube → 16
- Ancillary → 14
- Outreach → 43
- Others → 1112
- Problematic → 2

Command: 08:30:03.67 +01:19:41.5

Frame: ICRS

Projection: Aitoff

Welcome to Aladin, your professional sky atlas.

- Discover all astronomical data available over the net!
- Compare them with your own data.
- Prepare your observation missions.

To start, type any object name, such as M1, and press ENTER... Or easier, clic in the main frame and enjoy the sky...

select from: all collections

18.71° × 25.62'

0 sel / 0 src / 17fps / 362Mo

Aladin Sky Atlas: science case
Discovering Brown Dwarfs with the VO

Let's get started!

1. Launch Aladin: `java -jar Aladin.jar`
2. Discovery:
 - Region: 08:30:00 +01:30:00
 - Radius: 14 arcmin
 - Load 2MASS-PSC
 - Load SDSS-DR12
3. Cross-match to find common sources
 - 2MASS with SDSS-DR12
 - 4 arcsec
 - "bestmatch"
4. Filtering:
 - Select point sources using SDSS flag "class" = 6
 - Select sources with no detection in the u and g SDSS bands ($u > 22.0$ mag and $g > 22.2$ mag)
 - Select sources fulfilling the brown dwarf criteria provided by Burgasser et al. (2000, ApJ, 531, L57): $(J-H) < 0.3$ mag && $(H-K) < 0.3$ mag
5. Results and Analysis:
 - 1 source at RA: 127.703265deg; DEC: 1.475320deg
 - Use Simbad to confirm the brown dwarf nature of this object.

VO Virtual School, April 2020 M. Cortés Contreras 4

- 54 people connected permanently
- Video recorded → available online at the [SVO webpage](#) and YouTube CAB channel (~300 visualizations)

VOV II. Topcat

◆ VOV I. Topcat

Topcat windows

Step by step guide

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Detailed pdf tutorial

The screenshot displays the TOPCAT software interface. The main window shows a table with columns for RA2000, DE2000, F, RA2000, DE2000, and 2MASS. A 'Table Columns' dialog box is open, showing a list of columns for the '2MASS' table, including 'Index', 'Name', 'ID', 'Class', and 'Units'. A PDF tutorial titled 'TOPCAT: science case I' is overlaid on the right side, with a 'Launch TOPCAT' button. The PDF content includes a 'Discovery' section with the following details:

- VOV → VizieR Catalogue Service
- Region: 08:30:00 +01:30:00
- Radius: 14 arcmin
- By Keywords: 2MASS → V/147 → OK
- Surveys: SDSS-DR12 → OK

The PDF also includes a 'Cross-match:' section with a list of steps:

4. Filtering:
5. Results and Analysis:
6. Saving

The PDF footer indicates 'VO Virtual School, June 2020' and 'F. Jiménez-Esteban'.

- 62 people connected permanently
- Video recorded → available online at the [SVO webpage](#) and YouTube CAB channel (~100 visualizations)

Pros & Cons

◆ Pros:

- **Short** and **independent** video-tutorials focused on the teaching of **one tool** each
- **Unlimited** participants all around the world
- Although VOV workshops could be taught as many times as needed, once recorded the **online material** (pdf tutorial and video) will always be available
- As in regular VO schools, **several tutors** can be present to respond questions addressed via chat

◆ Cons:

- Not a proper hands-on experience
- Interaction with participants is conditioned
- Limited time for practical questions during the session

Improvements and future work

- ◆ A VOV session could be **extended**, creating small working groups for a hands-on experience
- ◆ Organize and record these workshops in **different languages and levels of difficulty**, reaching people of different countries and general public (amateurs, teachers...)
- ◆ IVOA official videos

- ◆ Classical VO schools can be **adapted** to a virtual format, with perhaps shorter duration (not days) and lower costs
- ◆ Organize more complete VO schools with regular sessions in a weekly basis (for example) during months → a proper **VOV course**

@ObsVirtEs

#SVO_VOV

Online material: <https://svo.cab.inta-csic.es> → Education & Outreach → Schools and Meetings

Thank you.