The IVOA at the IAU General Assembly

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IVOA Interop, Perth, Australia. October 2026

IAU 33rd General Assembly

10 - 19 August 2027, Rome, Italy

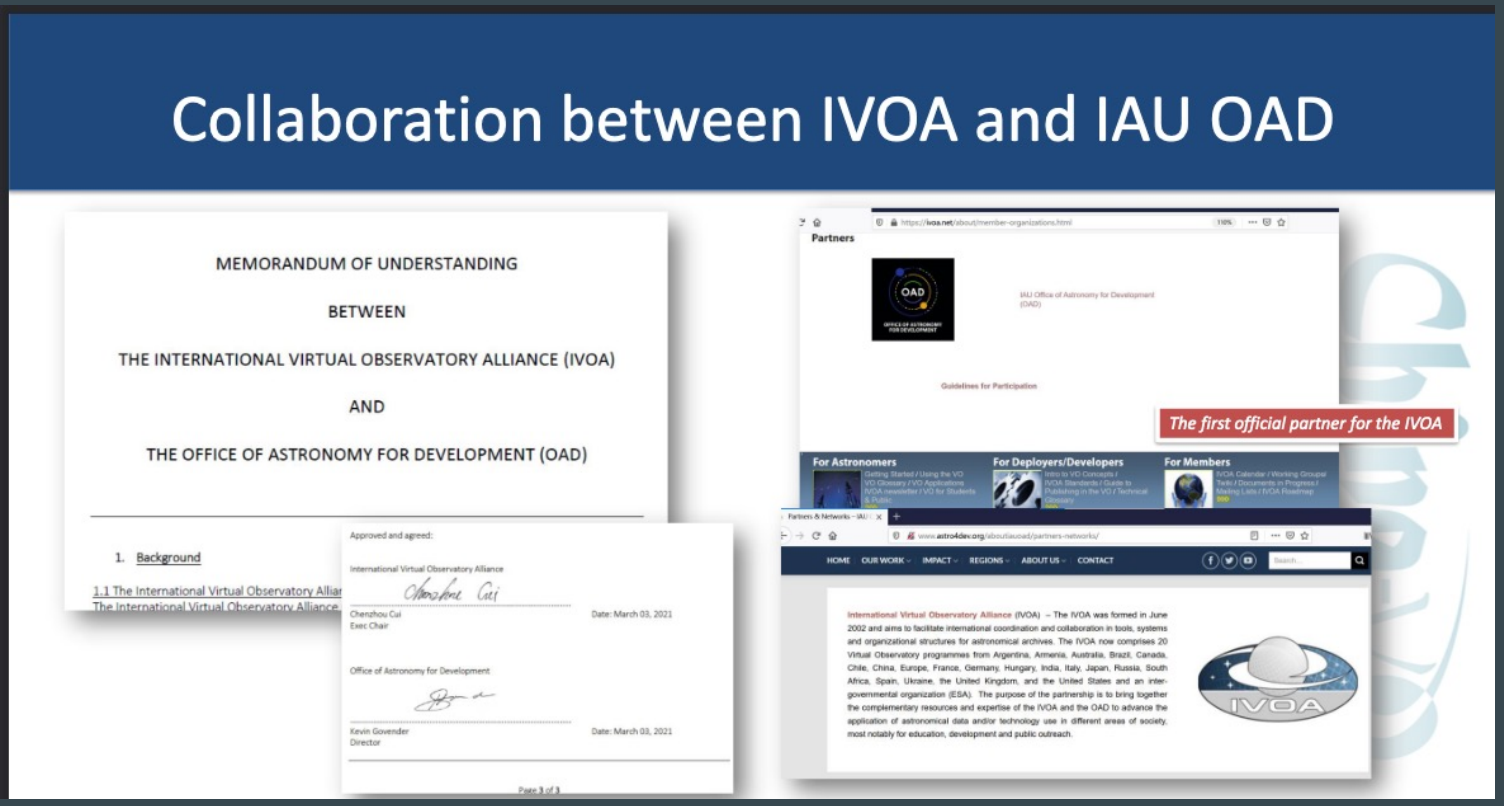


Engagement with the IAU

- Goals of IVOA are aligned with those of the IAU Strategic Plan:
  - *Advancing astronomy through dissemination of knowledge*
  - Producing the next generation of scientists
  - *Fostering inclusiveness*
  - *Education and global development*
  - Coordination with other fields



Memorandum of Understanding



IAU 32nd General Assembly

Cape Town, South Africa August 2024

IAU 32nd General Assembly

“The Benefits of the Virtual Observatory to Underserved Communities." Invited Talk at the Focus Session: Harnessing Ground-based Optical Telescopes: An Opportunity For Emerging Astronomy In Africa

Paper in Proceedings of IAU General Assembly, Cape Town, South Africa, 2024 at https://arxiv.org/pdf/2412.07973

Presentation at 10.5281/zenodo.13381867.

IAU 32nd General Assembly

Division B Days:
Community Engagement , Open Science and the Virtual Observatory
10.5281/zenodo.13550168

Scalable visualisation enabled by VO standards and tools. - Mark Allen

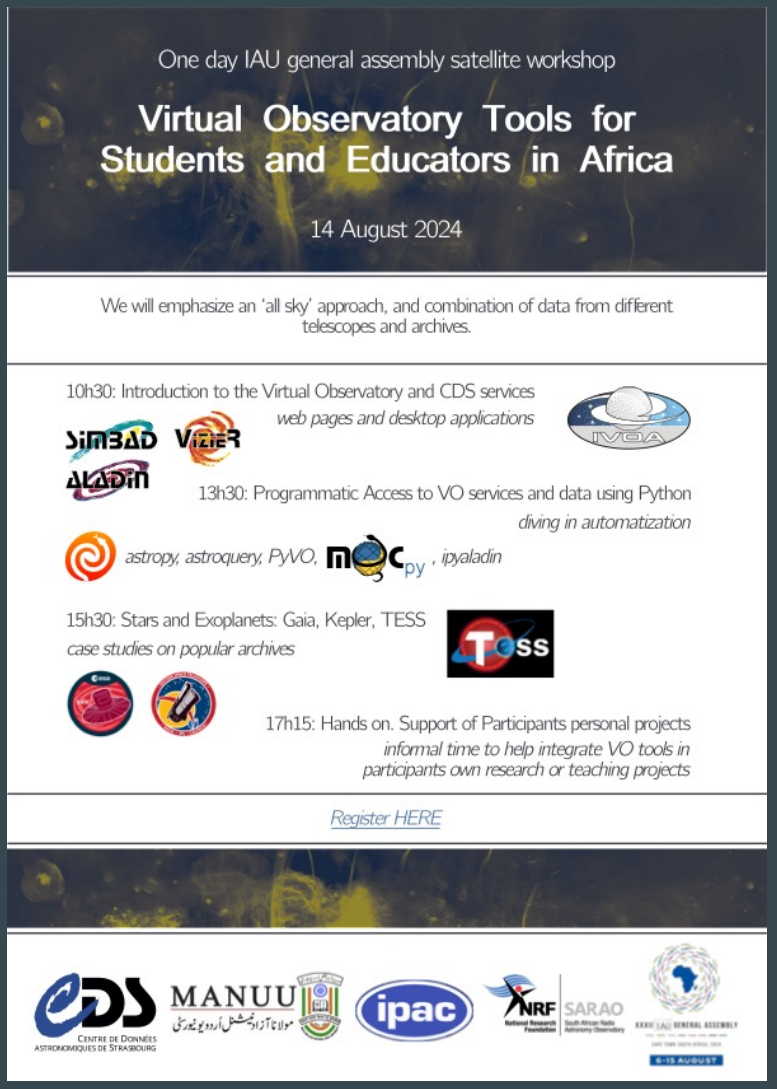
The VO, FAIR Principles and Open Science. - Bruce Berriman

Big Data, Open Science and Engagement in Radio Astronopmy – Russ Taylor
The VO and Education: Data accessibility in developing nations and access by underprivileged groups within developed nations - Priya Shah

Enabling Future Breakthroughs in Time-Doman and Multi- Messenger Astronomy – Brad Cenko

Satellite Workshop

- Organized by CDS
- Aimed at students and educators in Africa.
- In-person, 30+ attendees
- Hands on tutorials



IAU 31st General Assembly

Busan, South Korea. August 2021

IAU General Assembly 2022 – Busan, South Korea

Division B Meeting August 5-8, 2022

Session 3A: New Facilities and Growing Archives.
Chair: B. Berriman & Gabriele Giovannini 15.15 – 16.45 Room 101

15.15 – 15.35 D. Bock: Transforming our knowledge of the radio sky with ASKAP
15.35 – 15.55 G. Bruce Berriman: Enabling Science with Virtual Observatory
15.55 – 16.15 T. Beasley: Satellite interference with radio interferometers – [illegible] and new mitigation schemes
16.15 – 16.35 C. Walker: The Impact of Satellite Constellation on Optical Astronomy: the Issues and Mitigation Solutions
16.35 – 16.45 discussion

13.30 – 15.00 Session 5A: Laboratory Astrophysics Databases: from the provider to the user: encouraging FAIRness.
Chair: ML Dubernet and B. Berriman Room 101

13.30 – 13.40 WG Activities and Plans (ML Dubernet)
13.40 – 13.45 FAIR principles in VAMDC (ML Dubernet)
13.45 – 13.55 FAIR principles in IVOA (B. Berriman)
13.55 – 14.10 The NASA Ames PAH IR Spectroscopic Database (Christiaan Boersma)
14.10 – 14.25 Laboratory Astrophysics Databases on Grains and Ices: From the Laboratory to the Users (Cornelia Jäger)
14.25 – 14.40 About the atomic and molecular databases in the planetary community (Miriam Rengel)
14.40 – 14.55 Examples of astro analysis tools: ENIIGMA (Will Rocha)
14.55 – 15.00 General Discussion and concluding remarks



There were even two published papers

10.1017/S1743921323000026

Atomic and Molecular Databases Open Science for a sustainable world

Published online by Cambridge University Press: **19 March 2024**

M. L. Dubernet, G.B. Berriman, P. Barklem, K. Choi, A. Foster, I. Gordon, C. Hill, J. Kim, D.H. Kwon, H. Linnartz, Yu. Ralchenko, F. Salama, H. Shmagun, P. Schilke, D. Seo, J. Shim, S. Shin, M.-Y. Song, J. Tennyson and C. Vastel Show autho

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Honoring Charlotte Moore Sitterly: Astronomical Spectroscopy in the 21st Century
Proceedings IAU Symposium No. 371, 2024
D. R. Soderblom & G. Nave, eds.
doi:10.1017/S1743921323000327

Laboratory Astrophysics Data Working Group IAU 2022 GA session

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email: farid.salama@nasa.gov

Abstract. The paper corresponds to the session organised by the IAU inter-commission B2-B5 working group "Laboratory Astrophysics Data Compilation, Validation and Standardization: from the Laboratory to FAIR usage in the Astronomical Community" at the IAU 2022 General Assembly. The session included talks about the usage and implementation of FAIR concepts in VAMDC and in the IVOA, then domain specific talks oriented towards planetology, dust and ices. The program (doi.org/10.5281/zenodo.7050654) and the various talks can be found in the ZENODO "cb5-labastro" community (zenodo.org/communities/cb5-labastro).

Global Coordination of Ground and Space Astrophysics Working Group

IAU Executive Committee Working Group : global coordination of ground and space

August 8, 9, 10 2022

Session IV: Archives & Access: Future role of current telescopes and archives
Wednesday 8/10 10:30-12:00 (90 minutes)

Future Role of Current Telescopes (45 minutes)

How do you see the use of your facilities evolving over the next decade as more capable systems come into operation? Do you see them focusing on particular specialisations e.g. wide field surveys or transient follow-up? To what extent will you provide direct support for programmes on the new facilities compared to pursuing a complementary programme? How will you support Open Data?
Moderator: Ajit Kembhavi

panel discussion

- ING (Marc Balcells)
- GMRT (Yashwant Gupta)
- NRAO (Alberto Bolatto)
- Subaru (Michitoshi Yoshida)
- NOIRLab portfolio (Jen Lotz)
- SALT/MeerKAT/African Astronomy (Petri Vaisanen)

Future Role of Archives (45 minutes)

What efforts are currently being undertaken to coordinate archiving of data from different facilities, agencies, and wavelengths? How can archive coordination be improved in the future? What challenges are posed by the datasets from the next generation of facilities?

Moderator: rachel somerville

IVOA perspective -- Bruce Berriman
NASA perspective -- Vendana Desai
NOIRLab perspective -- Adam Bolton
ESO perspective -- Magda Arnaboldi

Q&A and discussion

IAU 33rd General Assembly

10 - 19 August 2027, Rome, Italy



IAU 33rd General Assembly

Abstracts for contributed talks/posters are due on January 15 2027

Division B Days

Division B dedicated scientific meeting days held during the GA.

Divisions have wide latitude in choosing format.

Division B Days

Proposal for Focus Meeting “Community Engagement and Open Science in the Virtual Observatory” declined.

“.. it might be
useful to showcase examples in which significant advances have been achieved as a result of the principles that are highlighted in the proposal.”

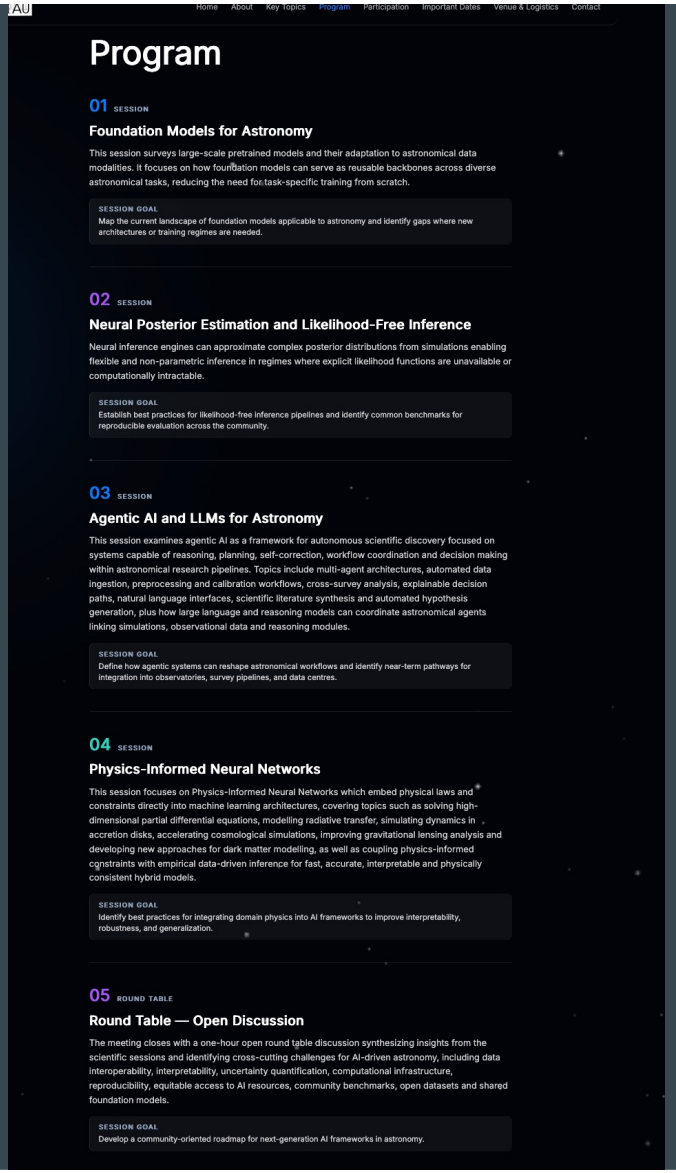
IAU Focus Meetings 2027

Foc

- **FM1:** AI Frontiers in Astronomy
- **FM2:** Protecting the Night Sky
- **FM3:** Magnetic Connectivity
- **FM4:** Interstellar Objects / Rubin Observatory
- **FM5:** Atmospheres
- **FM6:** Cosmology Centenary
- **FM7:** Shared Infrastructure / Geodesy
- **FM8:** AI in Outreach / Education
- **FM9:** Equality, Diversity, and Inclusion (EDI)
- **FM10:** Solar Variability
- **FM11:** The Sub-millimeter / Millimeter Universe
- **FM12:** Gravitational Lensing International Astronomi... +1

AI Frontiers in Astronomy

https://aifrontiers.cbpf.br/program



AI Frontiers in Astronomy

PROGRAMME

Program at a glance

- Four 2-hour scientific sessions
- One 1-hour final round-table discussion
- Plenary-style talks: 30 minutes each
- Contributed talks: 15 minutes including questions
- Poster summaries: 2-3 minutes each
- Final open discussion and roadmap session

9 h total **2** days **4** scientific sessions **1** round table

AI Frontiers for Astronomy

FOUNDATION MODELS · AGENTS · PROBABILISTIC INFERENCE

An IAU Interdisciplinary Focus Meeting exploring how foundation models, agentic AI systems, large language and reasoning models, probabilistic inference, and physics-informed machine learning are transforming astronomical discovery.

Artificial Intelligence is rapidly reshaping the way astronomical knowledge is produced, interpreted, and shared. This Focus Meeting will convene astrophysicists, computer scientists, machine learning researchers, and data-driven scientists to examine the emerging frontier of AI in astronomy. The meeting will focus on foundation models, autonomous agent-based systems, reasoning-driven architectures, simulation-based inference, likelihood-free methods, and physics-informed neural networks. Together these approaches offer new pathways for analyzing large-scale astronomical data, linking theory with observation, and building interpretable AI systems for next-generation surveys and multi-messenger science.

Register Interest | View Program | Submit Contribution | Contact Organizers

AI Frontiers in Astronomy

KEY THEMES

Six pillars of the meeting

All topics →

Agentic AI for Astronomy

Autonomous AI agents can coordinate end-to-end data analysis, reason over multimodal data streams, self-correct during workflows, and support scientific decision-making.

Neural Posterior Estimation

Neural inference engines can approximate complex posterior distributions from simulations, enabling fast and scalable Bayesian inference for astronomical models.

Foundation Models for Astronomy

Large-scale pretrained architectures can provide reusable backbones for astronomical analysis, transferable across surveys, instruments, and scientific tasks.

Likelihood-Free and Simulation-Based Inference

Likelihood-free methods integrate simulated and observed data in ways that support physical consistency and robust uncertainty quantification.

LLMs and LRMs for Astronomy

Large Language Models and Large Reasoning Models can guide agentic reasoning workflows, translate natural language scientific hypotheses into analytical actions.

Physics-Informed Neural Networks in Astronomy and Astrophysics

Physics-Informed Neural Networks embed physical and astrophysical equations directly into neural architectures.

AI Frontiers in Astronomy

01 SESSION

Foundation Models for Astronomy

This session surveys large-scale pretrained models and their adaptation to astronomical data modalities. It focuses on how foundation models can serve as reusable backbones across diverse astronomical tasks, reducing the need for task-specific training from scratch.

SESSION GOAL

Map the current landscape of foundation models applicable to astronomy and identify gaps where new architectures or training regimes are needed.

Agentic AI and LLMs for Astronomy

This session examines agentic AI as a framework for autonomous scientific discovery focused on systems capable of reasoning, planning, self-correction, workflow coordination and decision making within astronomical research pipelines. Topics include multi-agent architectures, automated data ingestion, preprocessing and calibration workflows, cross-survey analysis, explainable decision paths, natural language interfaces, scientific literature synthesis and automated hypothesis generation, plus how large language and reasoning models can coordinate astronomical agents linking simulations, observational data and reasoning modules.

SESSION GOAL

Define how agentic systems can reshape astronomical workflows and identify near-term pathways for integration into observatories, survey pipelines, and data centres.