

Powering African Radio Astronomy: The ilifu Cloud Infrastructure for MeerKAT and Beyond

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IDIA: Inter-University Institute for Data Intensive Astronomy (idia.ac.za)

- A partnership between three South African Universities (UCT, UWC and UP), working in close collaboration with SARAO
- To develop capacity and expertise in data-intensive research to enable global leadership in MeerKAT science and other Square Kilometer Array (SKA) precursor projects

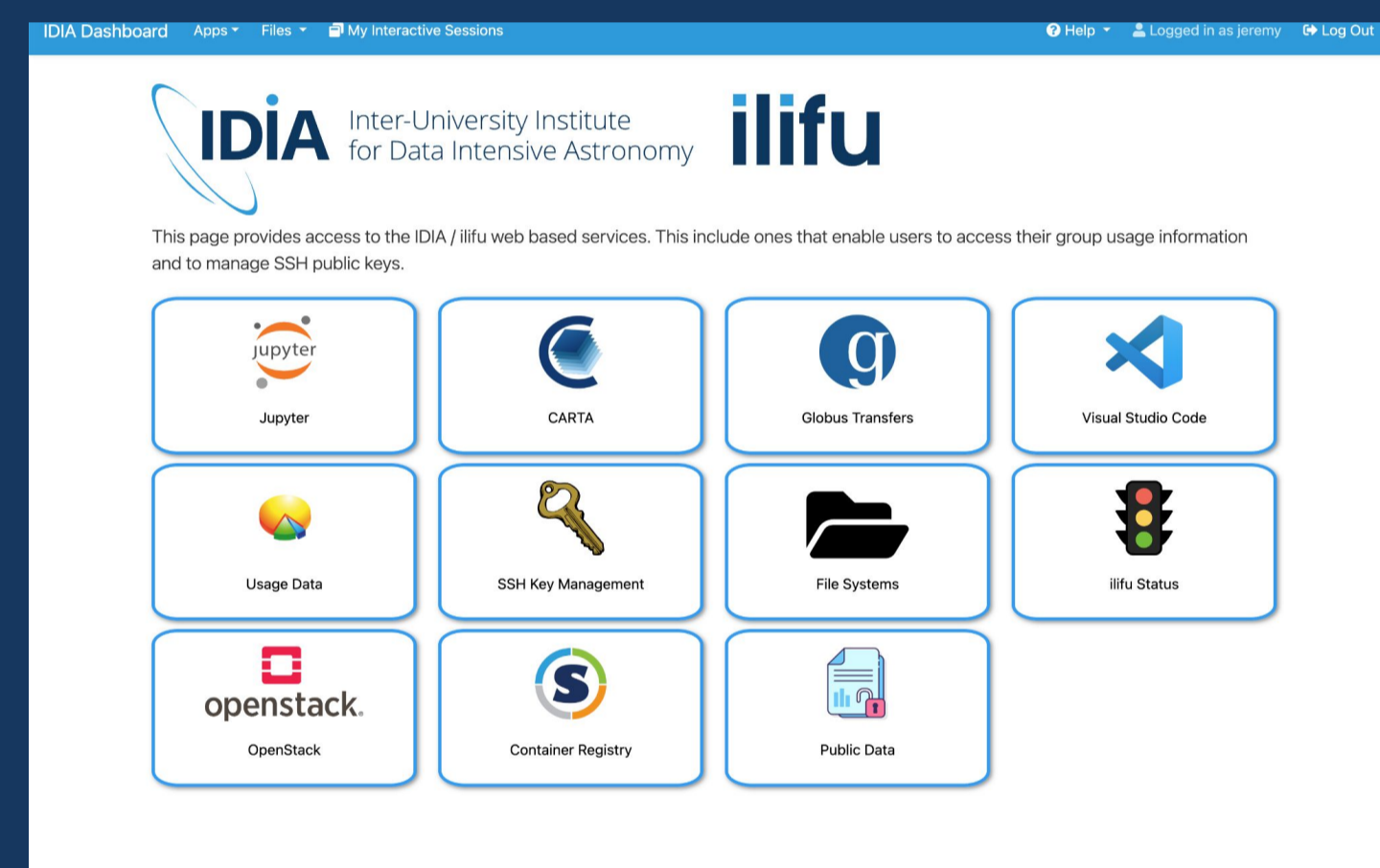


CARTA - Cube Analysis and Rendering Tool for Astronomy (cartavis.org), is the next-generation image **visualisation** and **analysis** tool designed for ALMA, VLA, and SKA pathfinder

- Support various image format, FITS, CASA, Miriad, HDF5

ilifu cloud facility (ilifu.ac.za)

- IDIA established and operates ilifu, a federated cloud compute facility for data intensive research in radio astronomy and bioinformatics, supporting many hundreds of students and researchers in South Africa and globally in data intensive research
- Consisting of over 4000 processor cores and 14 PB of storage, deployed an Openstack cloud system on the infrastructure that provides high performance computing in the form of IaaS and SaaS



IDIA Science Gateway application dashboard

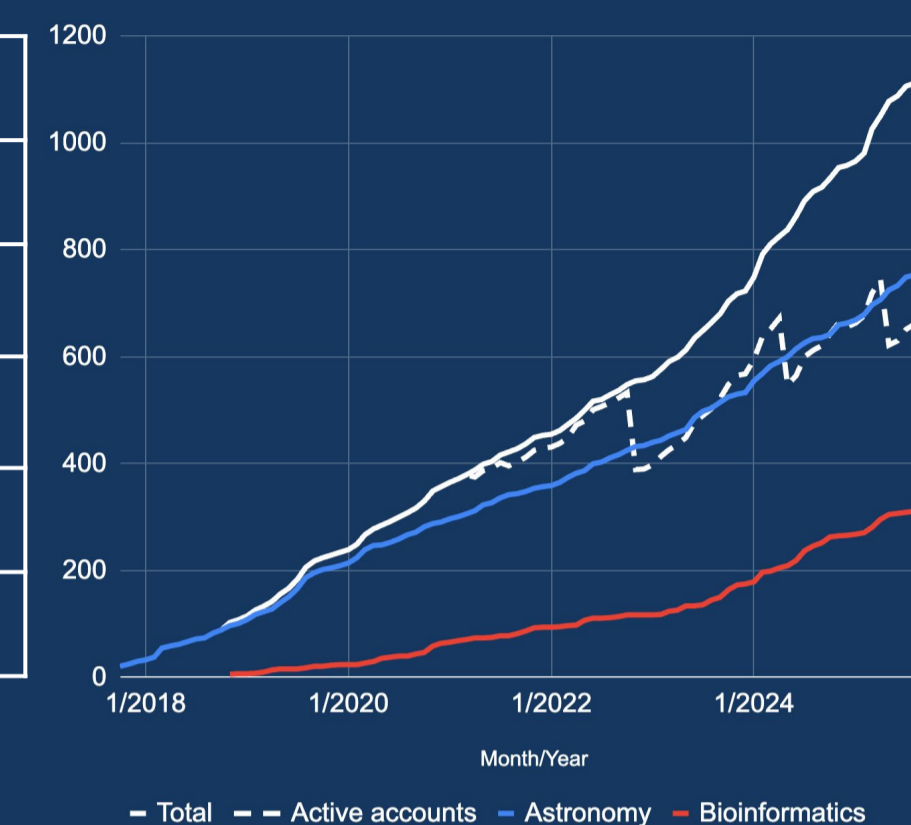
Supported Astronomy projects

- IDIA support 5/8 MeerKAT Large Survey Projects (LSP): MeerKAT Fornax Survey, MIGHTEE, LADUMA, ThunderKAT, MHONGOOSE
- SARAO MeerKAT Open Time Projects (OTPs)
- Others: VLBI, MeerLICHT, HIPPO, etc

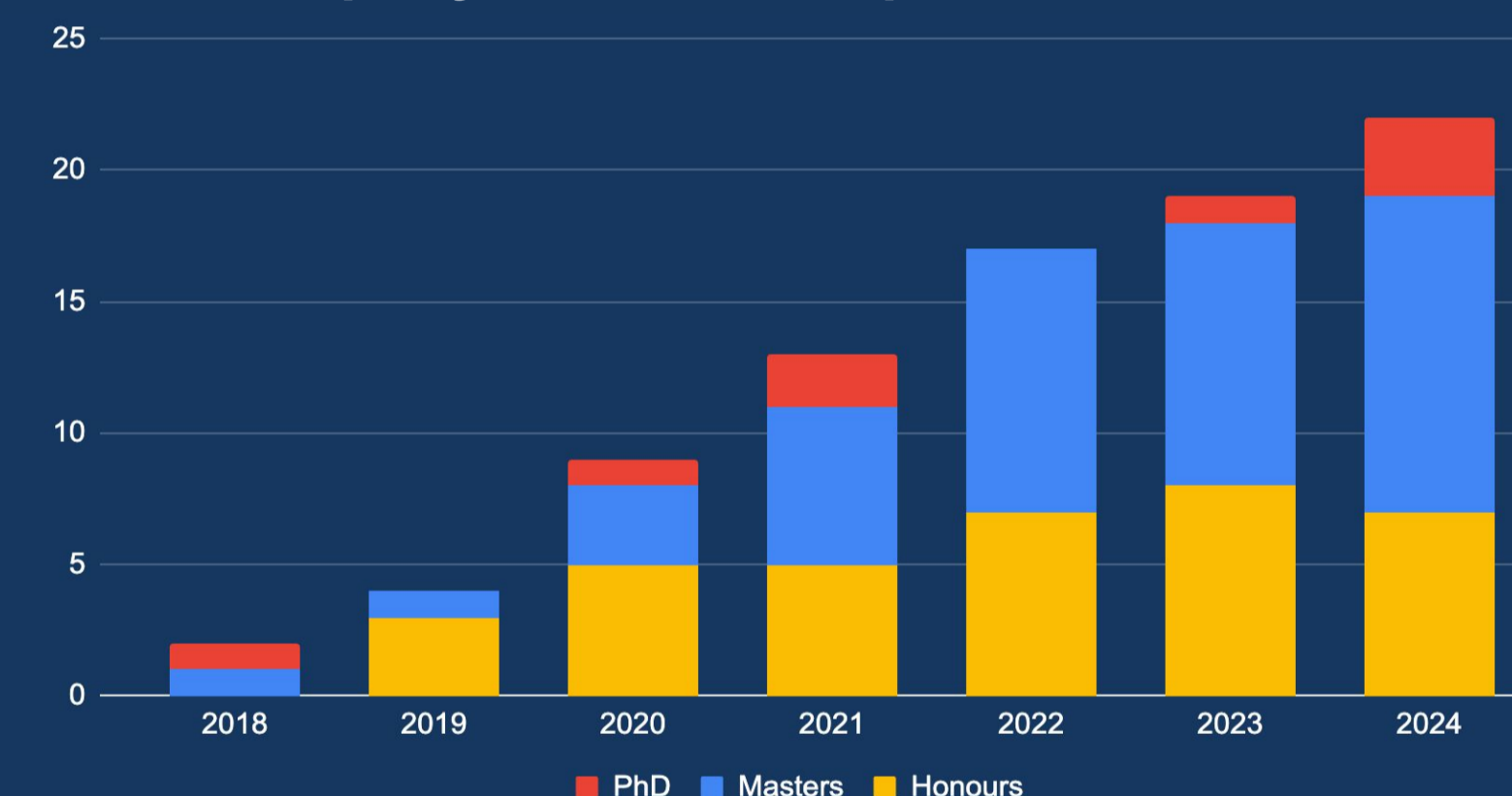


Current active astronomy users

Position/Enrolment	Count
Faculty/Staff	140
Postdoc	110
Student (PhD)	139
Student (Masters)	88
Student (Honours)	16

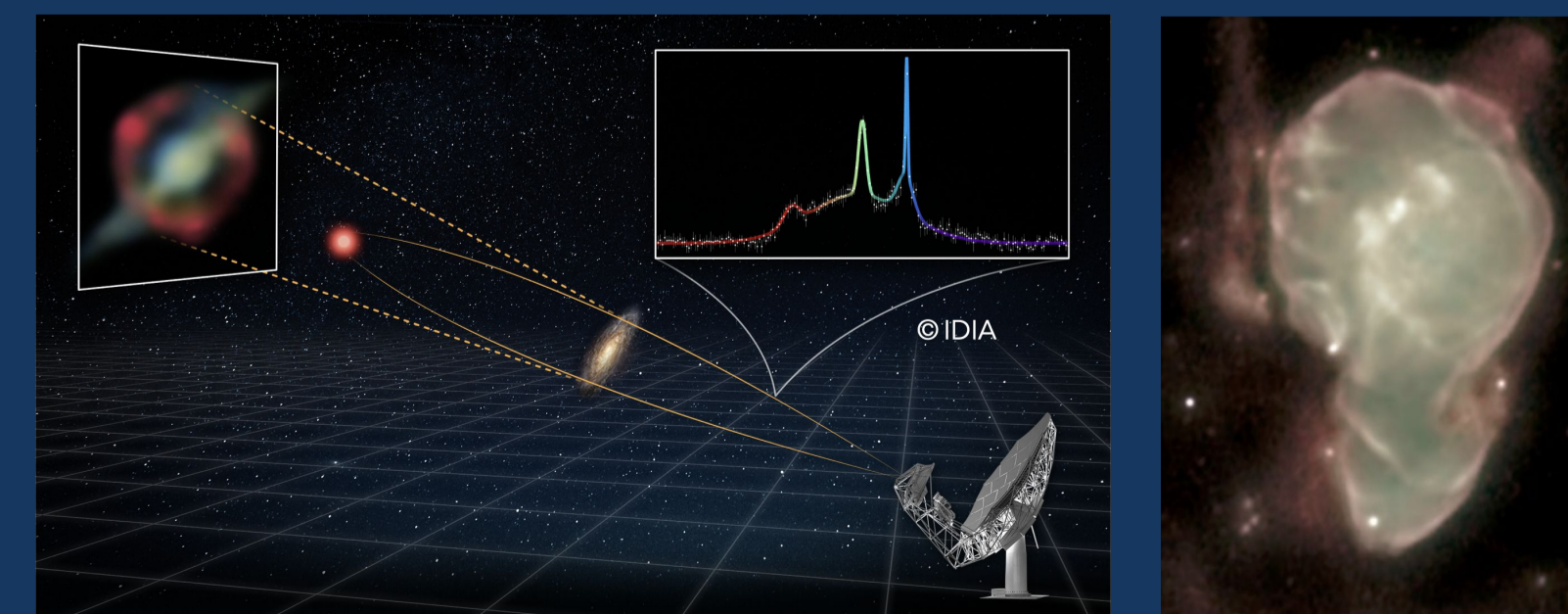


Graduates per year from IDIA partners



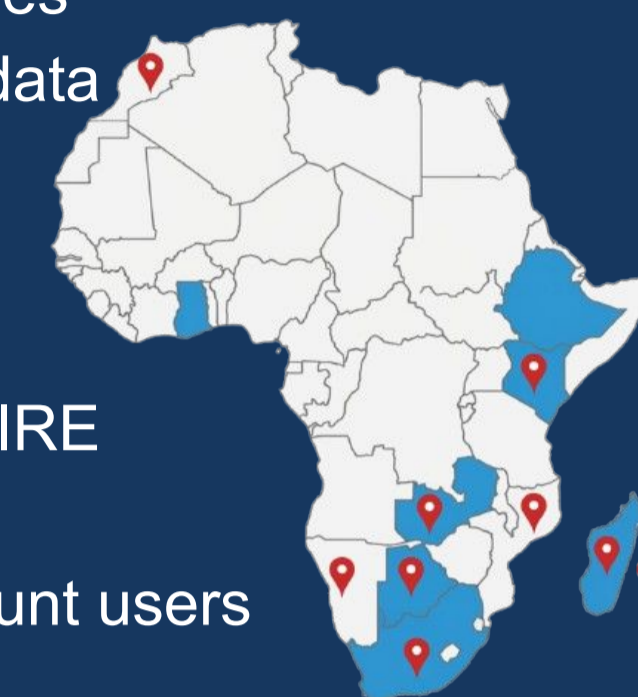
Powering student-led discovery

- Strongly-lensed OH gigamaser - Manamela et al. 2026 (UP)
- Circinus X-1 - Gasealahwe et al. 2025 (UCT)



Community support

- Services a broad user community; astronomy users from 121 institutions, 26 countries
- Easy access to large complex data
- Provides best-in-class services
- Accessed via single-sign on web gateway
- Federated access utilising SAFIRE and eduGAIN
- Designed to maximise the amount users can self-support
- Empowering students through support of data schools and hackathons
- Blue: countries with institutions with users on ilifu. Red: hosted ilifu-powered hackathons



2024 IAU GA Hackathon participants

Innovations



- IDIA Visualisation Laboratory (Vislab, vislab.idia.ac.za)
- iDaVIE, a VR tool designed to facilitate visualisation & data exploration

