



LBA Update

Phil Edwards | 23 October 2023

Australia's National Science Agency



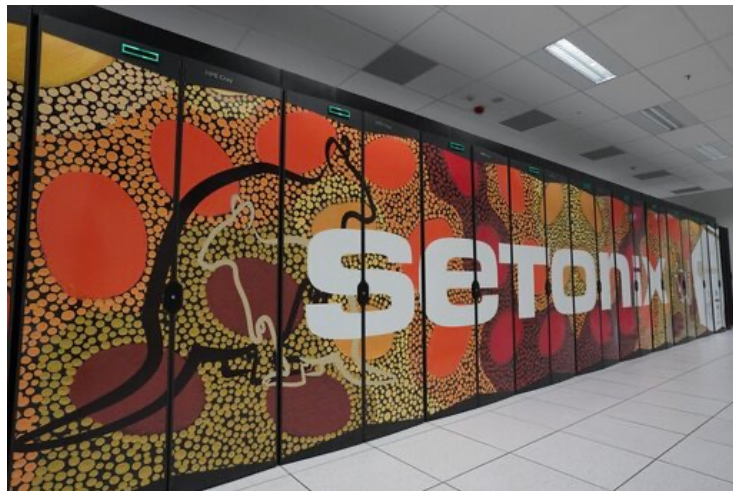
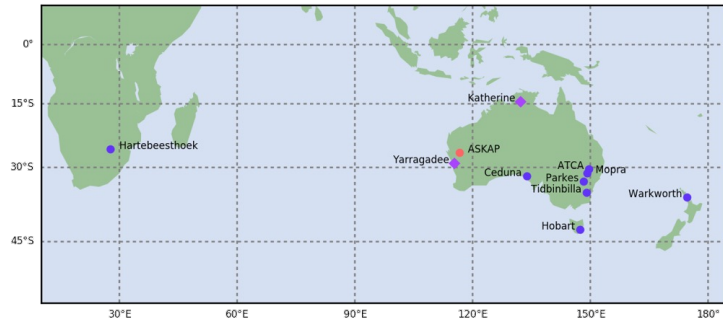


Outline

- LBA overview
- Current status
- Summary of observations Oct 2022 to Sep 2023
- Recent activities
- Recent publications
- Feedback from new observers



LBA overview



~ 30 days VLBI, ~4 sessions per year

Max rate 1 Gbps (128 MHz)

- Increasing to 4 Gbps in 2023

1.4 - 25 GHz

- ATCA, Mopra 43 & 86 GHz

Correlation using DiFX

Setonix supercomputer @Pawsey centre

- #14 on TOP500 supercomputers 2022
- eTransfer *only*



Current status

- Parkes: 0.7—4.0 GHz UWL receiver, 0.8—1.8 GHz CryoPAF
- ATCA: BIGCAT upgrade of correlator in 2024
- Mopra: Continued use for LBA, and contracted usage by KASI
- Hobart: The 26m is back on-line after a bearing failure in 2021
- AuScope: Katherine and Yarragadee upgrade to 2—14 GHz
- Warkworth: Now operated by SpaceOps NZ
- Tidbinbilla: New L-band receiver for the 70m in 2024
- LBA: increasing collaboration with EAVN, EVN, GMVA, GMRT, SARA0



Observations 2022 Oct to 2023 Sep

Band		Observations	Hours	Hours as %age
1.5 GHz	(20cm)	9	93	22%
2.3 GHz	(13cm)	4	58	14%
4.8 GHz	(6cm)	2	19	4%
6.7 GHz	(5cm)	1	8	2%
8.4 GHz	(3cm)	10	190	45%
22 GHz	(1.5cm)	1	12	3%
86 GHz.	(3mm)	6	45	10%

33 observations: 25 in 4 sessions, 8 out-of-session; 3 with EVN, 6 with GMVA



Recent activities

- Tests with GMRT at L-band and the EAVN at K-band
- Preparation of an LBA Science Case continuing
- Planning towards LAMBDA – a Low Frequency VLBI capability
- LBA presentations at APRIM and URSI meetings
- Useful feedback from first-time users in September LBA session
- Strong proposal pressure for 2023OCT – two ASKAP related proposals
- Four recent NAPA epochs and ToO observation in planning
- LBA Operations workshop held in October



DIFX Meeting 2023



- *Lots* of innovative applications:
 - VLITE, ngVLA, ASKAP FRBs, Transients, HRTR GNSS
- Docker/Singularity container
- DiFX-3 planning (vex2 support)
- Migrated from SVN to github (public)



Recent LBA publications

- A Keplerian disk with a four-arm spiral birthing an episodically accreting high-mass protostar
Burns et al., 2023 Nature Astronomy 7, 557
- The bright supernova 1996cr in the Circinus galaxy imaged with VLBI: shell structure with complex evolution
Bietenholz et al., 2023 MNRAS 521, 2239
- Milliarcsecond structures of variable peaked-spectrum sources
Ross et al., 2023 PASA 40, 5
- Very Long Baseline Interferometry observations of the high-redshift blazar candidate J0141-5427
Gabányi et al., 2023 PASA 40, 4
- Astrometric Apparent Motion of High-redshift Radio Sources
Titov et al., 2023 AJ 165, 69
- TANAMI: Tracking Active Galactic Nuclei with Austral Milliarcsecond Interferometry. III. First-epoch S band images
Benke et al., 2023, A&A in press (arxiv:2310.10206)

Thank you

CSIRO Space and Astronomy

Phil Edwards

Lead Scientist, Long Baseline Array

Philip.Edwards@csiro.au

www.csiro.au/atnf

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