



# Science Operations

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CSIRO ASTRONOMY & SPACE SCIENCE  
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# Outline

- The user community
- General issues
- Parkes
- ATCA
- Tidbinbilla
- Long Baseline Array
- Call for Proposals

# OPAL Users by Country (top 82%)

Country	Users	% of total
United States	779	21%
Australia	600	16%
Germany	341	9%
United Kingdom	293	8%
Japan	218	6%
Italy	195	5%
France	186	5%
China	153	4%
Netherlands	115	3%
Spain	109	3%
Canada	81	2%

A total of 3700 users in the OPAL database (since 2006).

# General issues

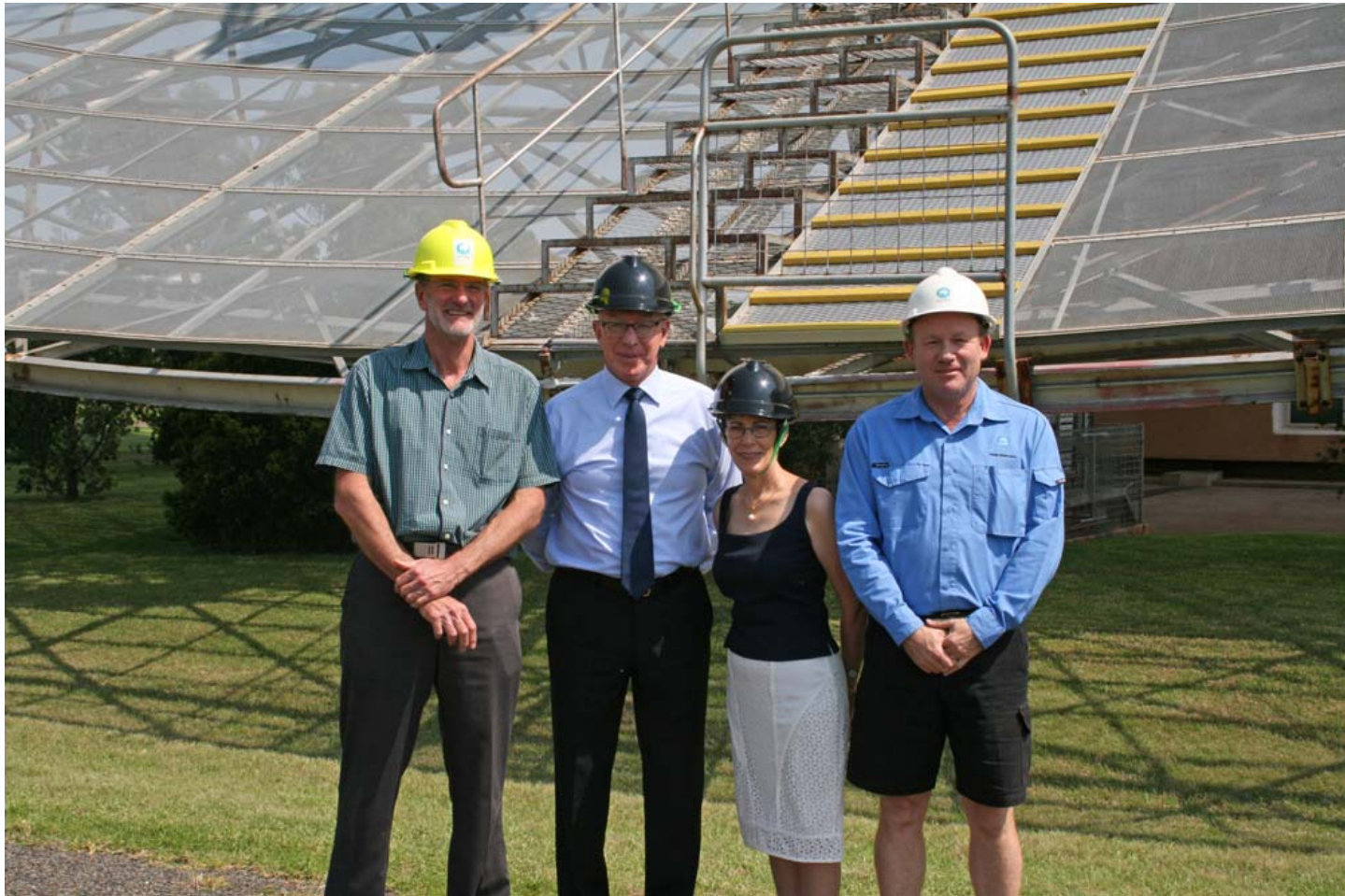
- The clearinghouse for information on ATCA data archives is now <http://www.atnf.csiro.au/observers/data/> ... which contains a link to the growing log of ATCA issues <http://www.narrabri.atnf.csiro.au/observing/IssueArchive.html>
- How can we attract more (and more useful) Observer Feedback? The existing questionnaire is overdue for an overhaul. Much of the feedback falls into one of three categories:
  - First-time observers
  - Regular observers with not much feedback to give
  - Really grumpy observers
- The numerical scale of responses allows feedback to be quantified, but usually the best feedback is the free format text

# New support model (from Feb 2015)

- All first-time observers will be required to come to the SOC, and will be provided with telescope orientation and training sessions
- The requirement for Parkes observers to return to the SOC annually will be dispensed with: the PI must ensure the observers on their team are trained and competent observers.
- All ATCA observers coming to the SOC will be provided with a Friend for the duration of their stay. The requirement to observe from the SOC annually in order to be “remote qualified” will be retained for most ATCA observers.
- Regular, competent observers (typically, people observing on at least three separate occasions or for more than 10 days per semester) can extend the time between their return visits by 6 months.

<http://www.atnf.csiro.au/observers/apply/ATNF-support.html>

# Parques visit by the Governor of NSW



His Excellency General The Honourable David Hurley AC DSC (Ret'd)

# Parkes

- The 2015OCT schedule was only released through to Dec 24. The schedule for the remainder of the semester will be released later this week
- There is a two-week shutdown this & next week to run optical fibre to the focus cabin, and install a new rack in the focus cabin
- There will be another two-week shutdown from Feb 1—12 to remove MB20 and install the MPIfR PAF
- MBCORR (and the WBC) will be decommissioned in the coming weeks
- A number of receiver changes will be made during 2015OCT, and 2016APR, so that the 10cm/50cm receiver and H-OH receiver (1.2-1.8 GHz) will be available at times during semester.

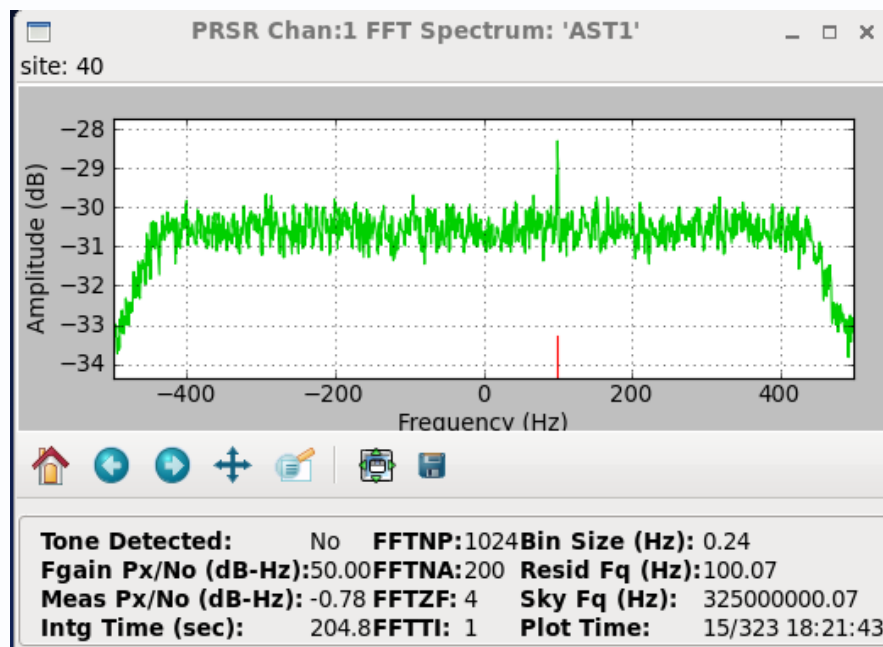
# Parkes

- It was discovered earlier in the year that DFB spectral line data were not being normalised correctly. That is, RPFITS spectra were found to be scaled in amplitude by the system gain, essentially an unknown factor.
- The problem was entirely correctable but required additional processing steps. The fault is now corrected and RPFITS spectra from the DFBs are now correctly normalised and calibrated.



# Bi-static radar demonstration

This month we have been undertaking bi-static radar demonstrations: the Tidbinbilla 70m transmits at a Near Earth Asteroid at 2.1 GHz, and Parkes receives the echo



Echo from 2005 UL5, 20-nov-2015

# ATCA

- A busy week was held recently at Narrabri to give the ATCA User Guide a thorough review and update: thanks to Robin Wark, Jamie Stevens, Shari Breen and Karen Lee-Waddell
- The sections on RFI (1.3.2) and data flagging (4.3.5) have been significantly expanded, as requested by ATUC.
- The producers of mid-week RFI continue to provide some advance warning of likely episodes.
- More explicit information also given in Call for Proposals about RFI in the 20cm band
- Two on-line training videos available for ATCA -- linked from <http://www.narrabri.atnf.csiro.au/observing/CurrentIssues.html>
- CABB aliasing of spectral lines in zoom mode – under investigation

**Embracing social media?**

**ATUG = TLDR?**

# Embracing social media...

“Phasebook” !



# ATCA automation

- Trials of unattended observing continuing.
  - One minor issue uncovered: the “countdown timer” on a dwell scan doesn’t start until all antennas are on source and tracking.
- Automated alerting via SMS has been on hold. Requirements are being drafted for the Software & Computing group to implement
- Can implement “queue observing” relatively easily, though may require schedules to be made with “normal” scan mode, or in UT
- “Service observing” has been offered in the past, but the preference is now for teams to find a local collaborator
- Full “dynamic scheduling” would require quicker CABB mode changes, and change to observer model/support

# ATCA Rapid Response

- It is possible to switch automatically in response to a trigger as soon as a valid schedule file is placed into a special directory.
- There has not yet been any scoping of a system required to receive an alert and respond intelligently
  - is the target above the ATCA horizon?
  - are we in a suitable array configuration and CABB configuration?
  - do we need to mosaic the field?
  - can this NAPA displace the current observer?
  - is a dcal required for this observation?
- Propose a trial limited to 4cm-band follow-up, with regular 4cm dcal' s after each CABB mode change & array config.

# A GPU-based replacement for CABB?

CABB is a powerful backend, that has significantly improved ATCA continuum sensitivity, but

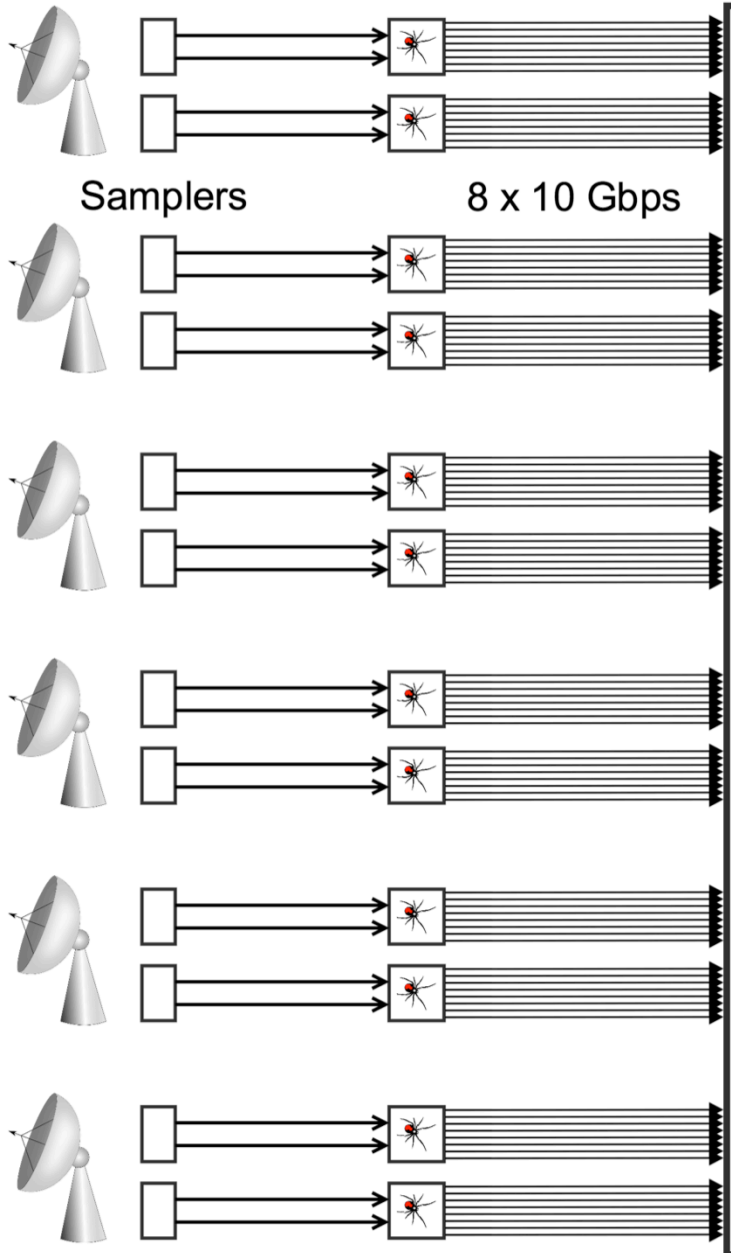
- Some CABB configuration changes take an expert an hour
- Not all initially anticipated zoom modes are available
- CABB blocks drop out at (ir)regular intervals
- The developers are no longer on staff

Could we improve flexibility, reliability and long term support with a GPU backend?

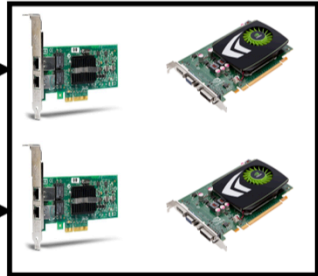
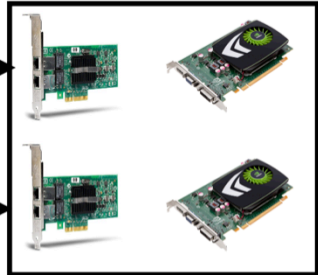
New samplers, which talk directly to optical fibre

Use ASKAP “redback” boards for coarse filterbank (128 MHz) and Ethernet packetisation (10 GbE)

Fine filterbank and cross correlation in GPU - Ethernet cross connect



2 x 40 Gbps



x16





# Costs: Total

Antennas	6	
Samplers	24	\$120,000
Redback	12	\$144,000
SFP Copper	192	\$7,680
SFP Optical	64	\$2,560
Server	16	\$128,000
GPU	32	\$32,000
NIC	32	\$25,600
Switch	1	\$30,000
Total		<b>\$489,840</b>

<http://www.atnf.csiro.au/vlbi/dokuwiki/doku.php/difx/meetings/hobart2015/agenda>

# Tidbinbilla

- The 4-channel K-band receiver upgrade has recently been completed on the 70m. This new system supports two simultaneous beams per polarisation (four beams in total) across the total frequency coverage of 17 GHz to 27 GHz
- It is planned to install a dual-circular polarization L-band system on DSS-43 ~mid-next-year, covering 1.4 – 1.9 GHz
- The Call for Proposals for 2016APR makes clearer the typical amounts of time available:
  - *“Access to Tidbinbilla antennas is provided through the host country agreement, which provides approximately 220 hours in total each semester, which is used for both single dish (typically 180 hours per semester) and LBA (typically 40 hours per semester) use.”*
- Helga Denes has taken over as ATNF Friend of Tidbinbilla



# LambdaGammaBI – looking up from down under

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20 April 2015

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Credit to Leonid Gurvits for suggesting this title...



# ΛΓΒΙ

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20 April 2015

— looking up from down under

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...which may be more comprehensible in this format!

# Long Baseline Array (VLBI)

- Correlation of LBA data was carried out under contract by Curtin University until the end of September 2015.
- Correlation has now been brought back “in-house” and a term position was advertised for LBA correlation and commissioning support: Cormac Reynolds started in October
- During VLBI observations last week we co-observed with the TianMa 65m telescope in Shanghai & the Kunming 20m telescope
- The Mopra telescope has been mothballed for the summer while arrangements for possible future operations are made
- Requests for Tid 70m being made earlier, with some success
- On-line training videos for VLBI observing

# Call for Proposals

Call for Proposals for 2016APR released last week:

<http://www.atnf.csiro.au/observers/apply/avail.html>

Proposal deadline is 5pm AEDT Tuesday December 15<sup>th</sup>.

TAC procedures are outlined at [www.atnf.csiro.au/management/tac/](http://www.atnf.csiro.au/management/tac/)

We ask users to include their proposal codes in their publications.

# Thank you

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