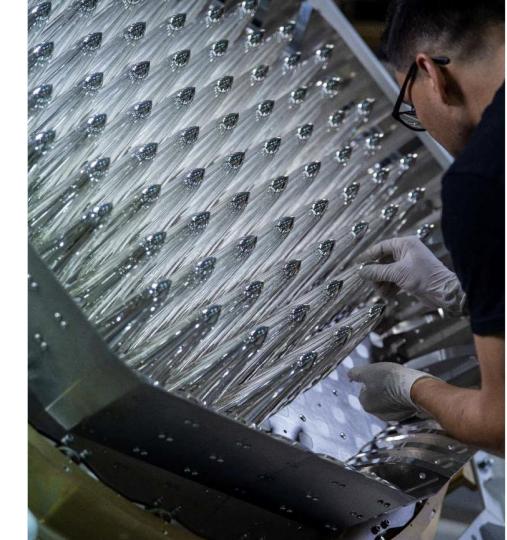


ATUC: Session 3 Upcoming Instrumentation

ATUC meeting 9 April 2025



Australia's National Science Agency



Management of ATNF Projects

Mark Bowen

ATNF Program – Project Portfolio Management

ATNF Project Management

- The new ATNF structure enables a change in the way ATNF projects are managed
- ATNF projects will be managed as a 'portfolio' by the ATNF Leadership Team
- Integration and visibility of: Software and Computing + Operations + Science project delivery
- Coordination between ATNF Program Director, 'Heads of ...', and 'Chiefs ...'
- S&A Project Review Board (PRB) reporting focussed on issues that require input from S&A leadership
- Goal is to assist Project Leaders in managing their projects:
 - 1. Improved coordination between ATNF projects
 - 2. Regular meetings of the leadership of ATNF projects as a group (i.e. PL, PS, PM, PE)
 - 3. Focus on management of issues, exceptions, relative priorities within ATNF rather than progress reporting (i.e. what do you need)
 - 4. Reporting overhead minimised fit for purpose
- Common framework for management of the portfolio of ATNF projects
- Guidelines flexible enough to accommodate different types of projects



Implementation

- Timeline for implementation under development Stage 1 in place for next PRB (October)
- DRAFT plan preparing for discussion with Project Leadership

PRB Reporting – Project Portfolio Showcase

- ATNF Program Showcase based on Enterprise Project Management Office (EPMO) – Program reporting template
- Individual projects may present at the S&A PRB if there is a specific need (e.g. showcase a major result, etc.)
- Work-in-Progress PRB asked for feedback on content





ATNF Project Management Plan

- Framework and guidelines for management of the portfolio of ATNF projects
- Plan currently a skeleton with major headings defined
- Plan based on CSIRO EPMO template
- Plan developed and implemented in stages:
 - 1. Initial priority Project management, risk management
 - 2. System engineering, configuration management

Communications Plan

- Project management related meetings cadence, scope, etc.
- DRAFT plan preparing for discussion with Project Leadership

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			ATNF Progra	m Managem	ent Gro	up			
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ATNF Project Portfolio Showcase

- PRB reporting focussed on issues that require S&A leadership input
- Proposed as the primary means of reporting to the S&A PRB
- Based on an EPMO Program Report
- Snapshot of the portfolio of active ATNF projects
 - Based on individual project dashboards
 - Summary of the status of each project
 - Successes and issues/concerns
 - Visibility of the timelines of the portfolio of projects
 - Risks and impact of changes
 - Specific requests for feedback from the S&A PRB
- Work-in-progress report will be refined based on feedback





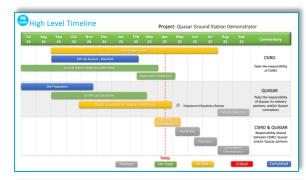
ATNF Portfolio Review Board/Committee (TBD)

- Project reports based on the existing EPMO 'project dashboard'
- Reviews all ATNF projects (i.e. progress, schedule, finance, issues, etc.)
- Small-scale R&D projects reviewed/discussed (TBD)
- Meets every 3 months (TBC)

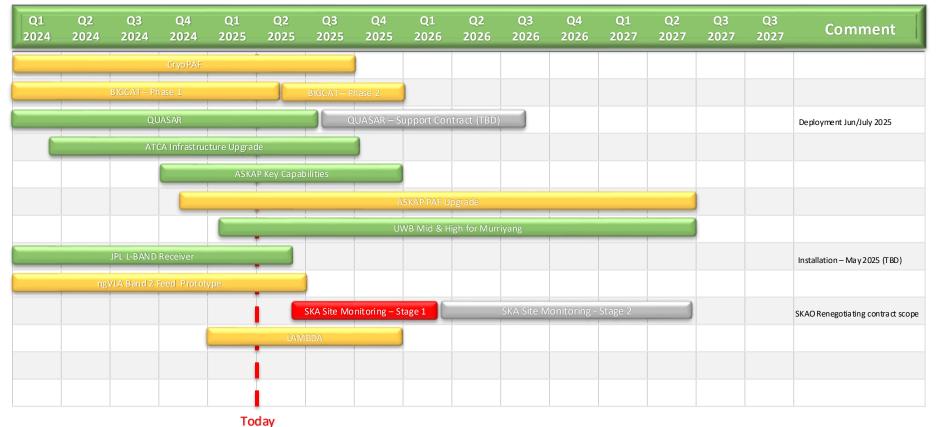
S&A Project Review Board (TBC)

- Approves/endorses S&A project proposals and significant changes
- Sets relative priority of RU projects/portfolio (e.g. to resolve manpower conflicts – across programs)
- Meets every 6 months (March and October)

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Vi Monte Resembles	r.	M4 MW Assembly and Integration	Jun 2023	Sep 2023		 System firmware and software updates in March 2025. 			
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M7 System Demonstration – Torrumbarry 3ad 2025 Emerging – Quasar may seek to delay WC during Mercline 2025	ş.	M6 Deployment to Torrumbarry	Jun 2025		 Minimal spares mean any equipment failure will 	on the Quasar network in April 2025.			
	5 M7 System Demonstration - Torrumbarry		Jul 2025			 Complete preparations for deployment to Torrumbarry 			
	۹.	M8 MVP Review and Project Close				VIC during May/Jun 2025.			



ATNF Program – Project Portfolio Timelines



Planned



At Risk





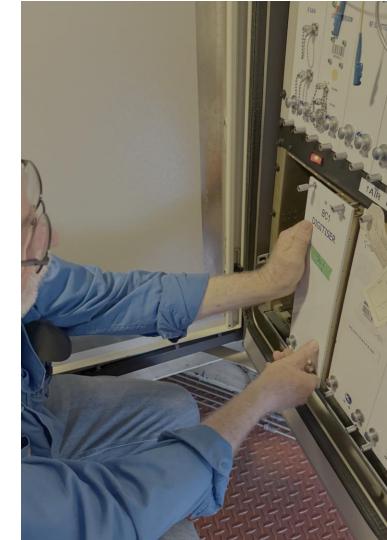
Status of the BIGCAT project - Chris Phillips



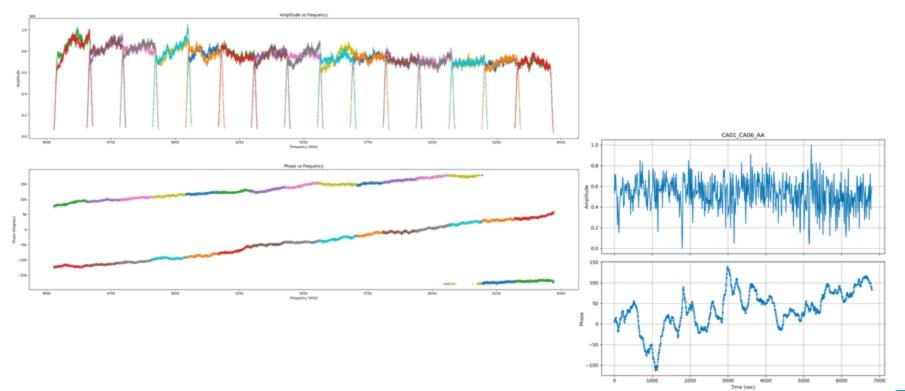


Commissioning Started!!

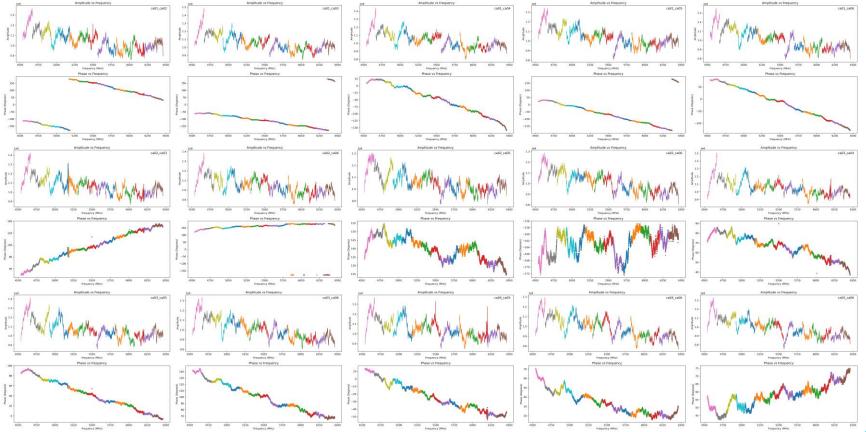
- Jimble digitisers installed in all 6 antenna (28 March)
 - Fringes obtained from all 6 ants on same day
- Engineering commissioning underway
- 1x2 GHz dual pol, using CABB conversion
 - 1x2 GHz CABB IF remaining for comparison
 - Can run in parallel, but single source
- Will transition to 2x2 GHz BIGCAT over next few weeks
- Already identified 2 subtle phase problems with CABB IF (not BIGCAT hardware)



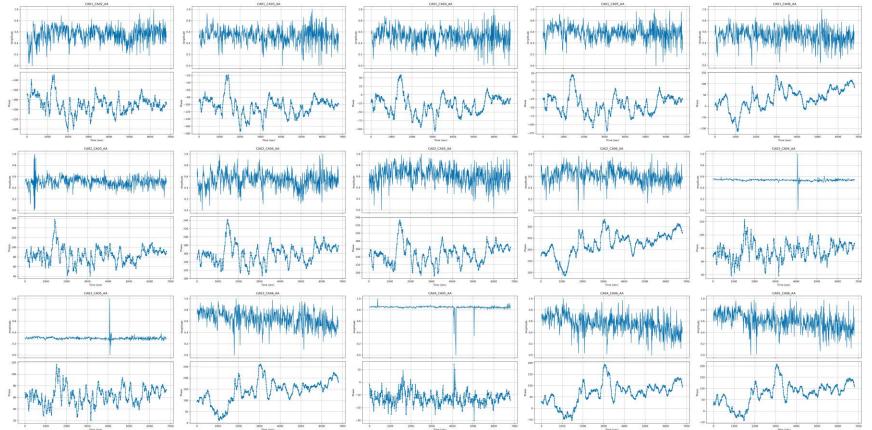
Visibilities





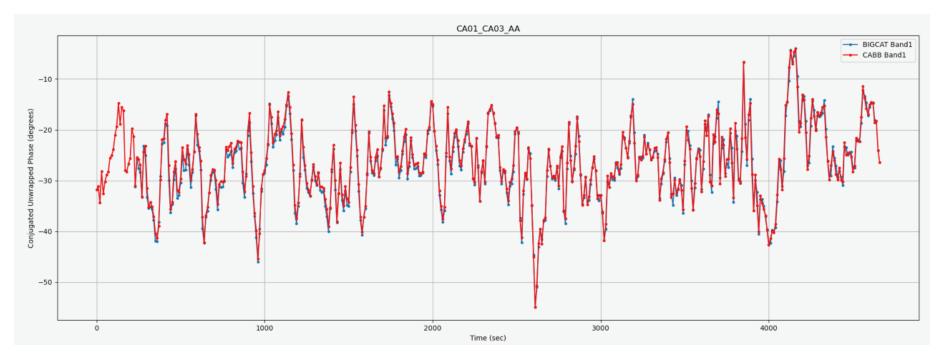








BIGCAT/CABB Comparison





Rough Timelines

- Engineering commissioning April'25
 - Finalising Zoombands, Tsys extraction, CASA import etc
 - Will have route to Miriad
 - Science commissioning May'25
 - Commissioning Team ready to start
 - Schedule observations starting June'25 if all goes well
 - Not hard deadline, may have gradual transition from science commissioning to schedule observations
 - Initially using CABB IF 2x2 GHz (start May'25)
 - 8 GHz BIGCAT IF installed ~ September
 - Conflicts with major shutdown



Day Zero Features

- 4 GHz bandwidth
 - Flexible integration time
 - Frequency resolution up to 10's kHz over entire band**
- Flexible zoom setups
 - Limited set of default setups, trivial to add more
- New caobs
 - New vis/spd equivalent
- New BIGCAT scheduler
- ASDM output
- CASDA archive
 - ** Subject to output data rate limits

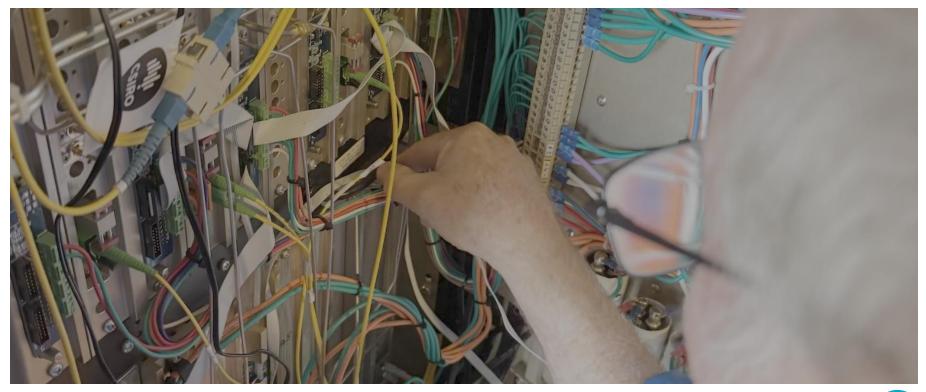


Day Zero non-features

- No tied array voltage
 - Next priority after zoom bands fully commissioned
 - Single dish 128 MHz relatively easy to implement
- No subarrays
 - Basic support in place, needs extensive testing
- No Pulsar modes
- No SSA
 - Needs appropriate geometric model support
- All will be implemented over next 6 months. Expected to be ready by OCT25 semester



Stay tuned for first image (post Easter)







Status of the CryoPAF project Simon Johnston



CryoPAF General Specifications

Frequency range of 700-1950 MHz in two bands: 700-1100 MHz and 1100-1950 MHz Processed bandwidth of 600 MHz

T_{sys} < 20K, Tsys/eff ~ 30 K

Phased array feed with 98 dual linear polarized elements

Maximum of 72 beams (8 for pulsar timing and VLBI). FoV approx 1.5 sq deg @1.4 GHz Rotation allows tracking in parallactic angle



The good, the less good and the future

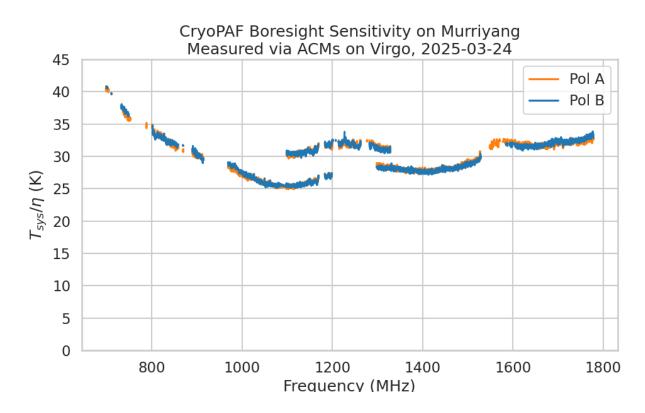
Good news

- On dish since February
- Excellent Tsys performance
- Science modes tested and working
 - Spectral line (zoom bands)
 - Search mode (high time res)
 - Pulsar-fold mode
- Full 72 beam data capture
- Progress with TOS/Garriwang

Less good news

- Cryogenic issues persist
- Only 230 MHz 576 MHz coming in July
- Jimble (A/D) issues remain
- Black belt operation/observing
- Real time transient detection mode not yet started
- SETI mode not yet complete
- No commissioning postdocs
- No Parkes System Scientist

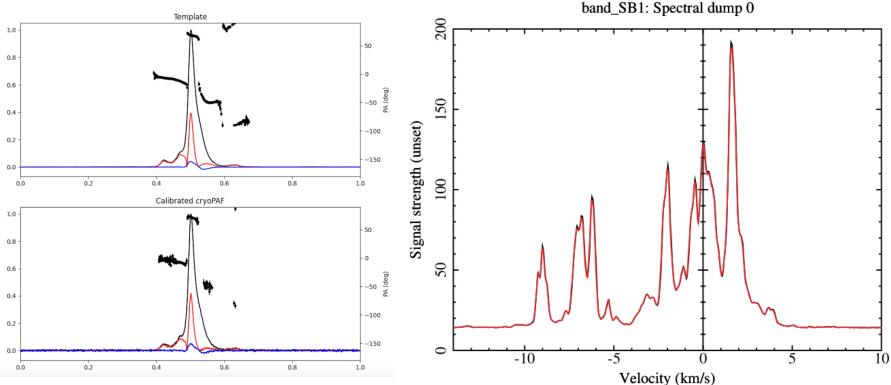
First Results – on dish testing



Preliminary results across the band in 230 MHz chunks (with RFI removed).

Some artifacts but overall excellent performance and a bit below the spec of 30 K over much of the band.

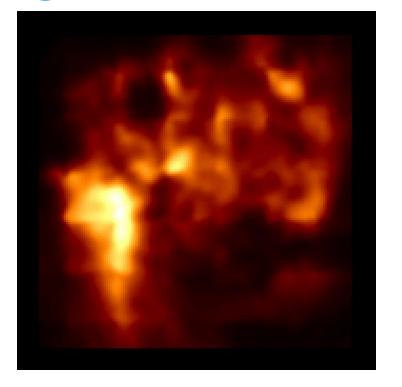




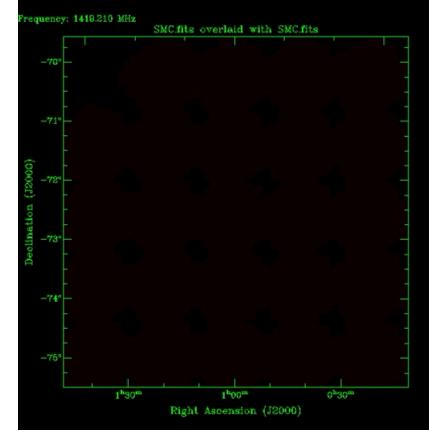
Polarization of the pulsar J0437-4715. Voltage/fold mode

OH maser spectrum with 140 Hz resolution.

First Results – on dish testing



HI total intensity of the LMC, and movie of the SMC.



The good, the less good and the future

Future

- The cryogenic issues remain a concern and solutions are being sought
- Work continues on :
 - Quantifying system performance
 - Fully shaking down the science modes
 - Making beam weights easier to compute / upload
 - System integration into TOS / Gariwang
 - Delivering meta-data to the user
 - Simplifying observing
 - Upgrading from 230 to 576 MHz bandwidth
- 1 April semester shared risk observing will start soon
- 1 October semester 600 MHz bandwidth, push button observing
- 2026 : real-time transient detection, user-driven modes, beam footprints etc