

Parkes

ATUC

Jimi Green | Parkes Senior System Scientist, CASS Group Leader
20th November 2018

CSIRO ASTRONOMY AND SPACE SCIENCE
www.csiro.au

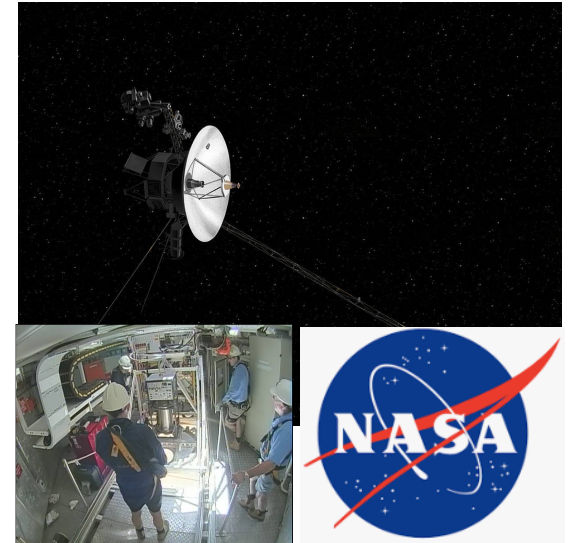


Overview

- NASA Voyager 2 tracking & schedule changes
- Ultra wideband receiver (UWL)
- Cryogenically cool Phased Array Feed (cryo-PAF) Update
- Maintenance
- ATUC responses
 - Fast Radio Burst Mode
 - Contract time: Breakthrough Listen & FAST/NAOC
 - Documentation

Impact of NASA Voyager 2 tracking

- 11 hrs per day, 11 days out of 14, ~3 months, approx. 15hrs to 02hrs LST (core Galactic LST hours subsumed)
- Multibeam out, Mars in
- 3-day breaks are utilized by maintenance plus pulsar timing and PhD critical projects
- scheduled parts of first month (April 2019) of next semester already (see online schedule)
- 847 hrs allocation in 2018OCT, Breakthrough Listen ~300hrs (~400 hrs to make up over coming semesters), brings contract time to 47% for semester
- John Sarkissian, Jane Kaczmarek and Stacy Mader supporting the observations locally.
- Media release to follow (potentially next week)

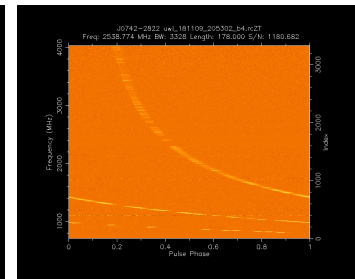
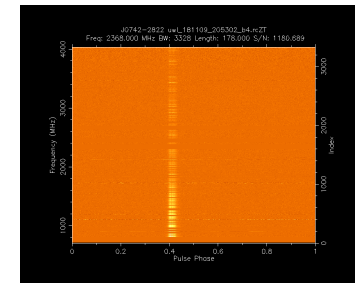
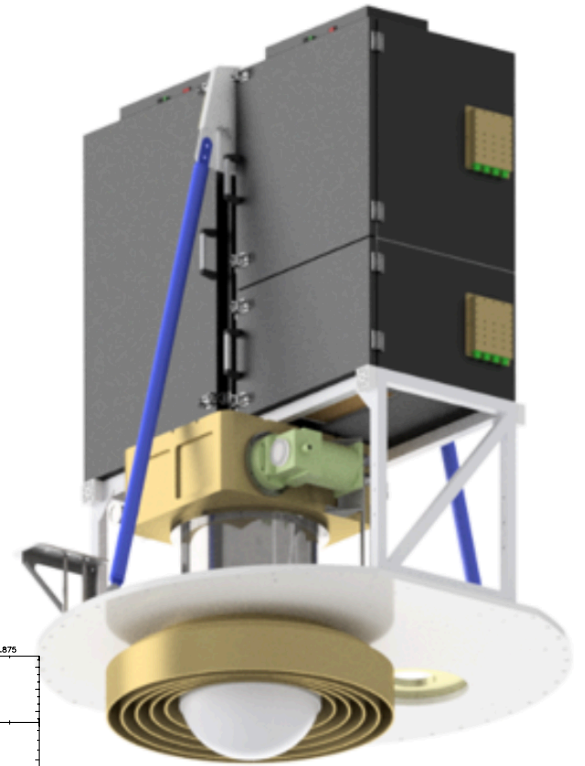
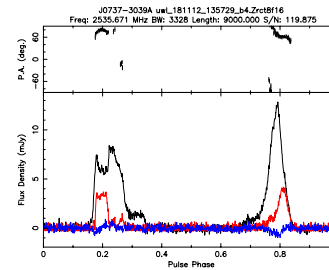
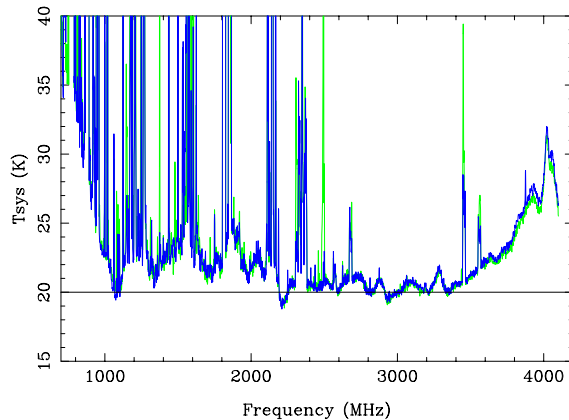


Parkes Radiotelescope
Schedule:- 12 Nov - 25 Nov

	UT	14	16	18	20	22	0	2	4	6	8	10	12	14
	AEST	0	2	4	6	8	10	12	14	16	18	20	22	24
Mon 12 Nov	UWL Commission													
Tue 13 Nov	P455 (1300)					P971 (1145)								
Wed 14 Nov	P958 (1300)					BL (1400)								
Thu 15 Nov	P998(Han) (1300)					P880 (1400)								
Fri 16 Nov	PX500(Li) (1300)					P789(Spencer) (1400)								
Sat 17 Nov	P972(Oswald) (1300)													
Sun 18 Nov	P3200(Kuper) (1300)					P571 (1400)								
Mon 19 Nov						P574(Dai) (1400)								
Tue 20 Nov	P458(Hobbs) (1300)					BL (1400)								
Wed 21 Nov	P458(Hobbs) (1300)					P895(Hobbs) (1400)								

Ultra-Wideband Low (UWL)

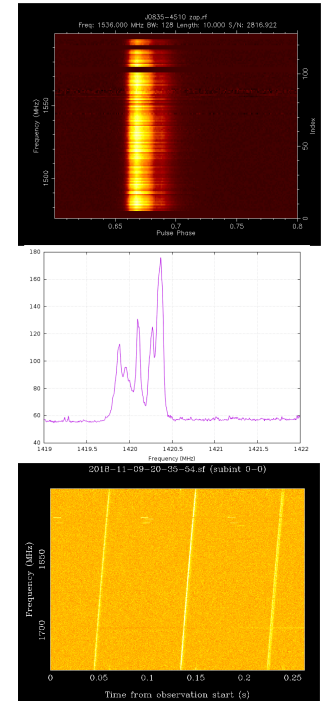
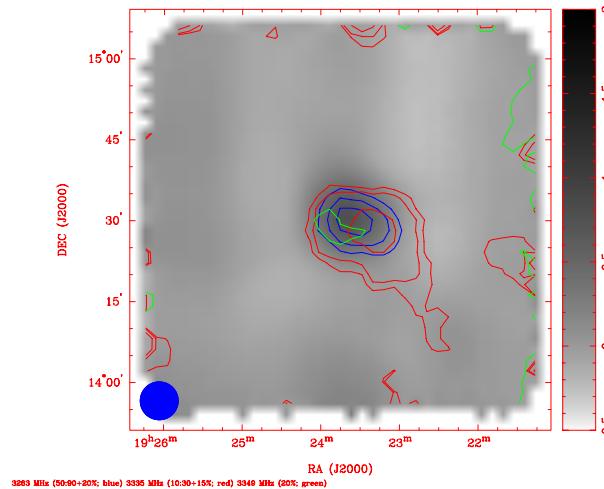
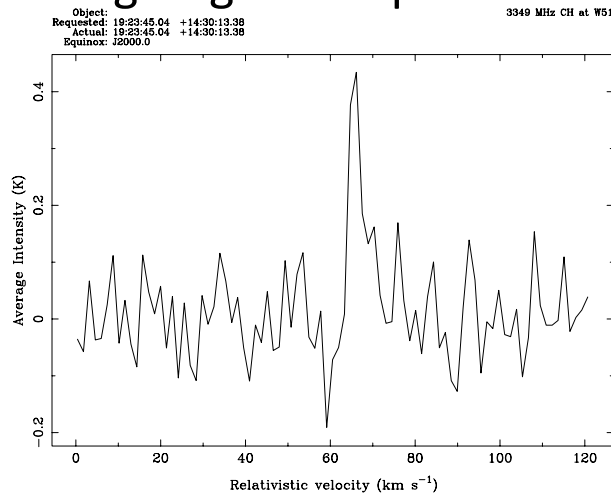
- UWL re-installed on dish in November with new LNAs (with direct noise injection – see technologies talk!)
- UWL represents three-fold newness:
 - New front end
 - New back end ('MEDUSA' GPU cluster)
 - New control software (TOS GUI)
- Finished commissioning run and re-commenced observing



Ultra-Wideband Low (UWL)

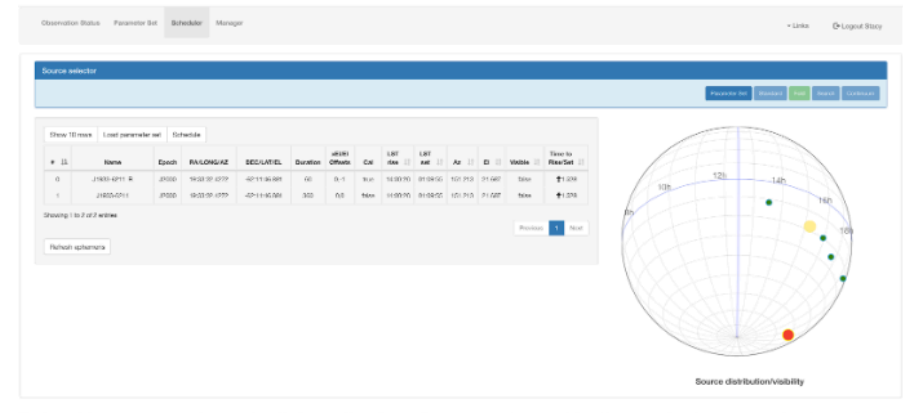
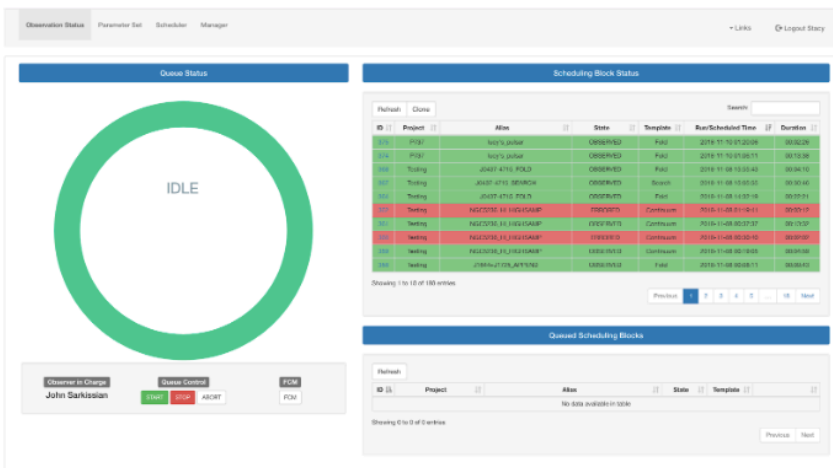
current developments and queries

- Formal engineering project finished, operational aspects still developing (modes, calibration schemes, over-sampling, RFI mitigation)
- Very large data volumes being obtained - GPU capability opening up massive data rate modes – DAP supercomputing? Impact on subsequent observers?
- Looking at versions of medusa builds to ensure safe ongoing development



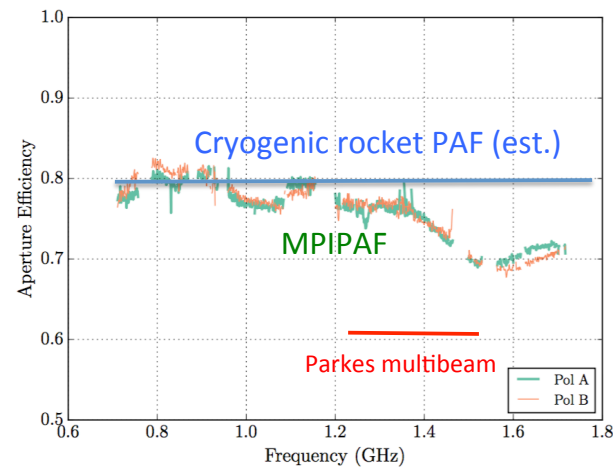
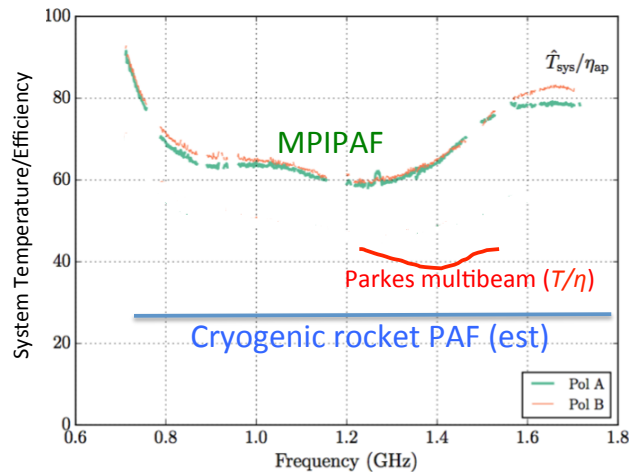
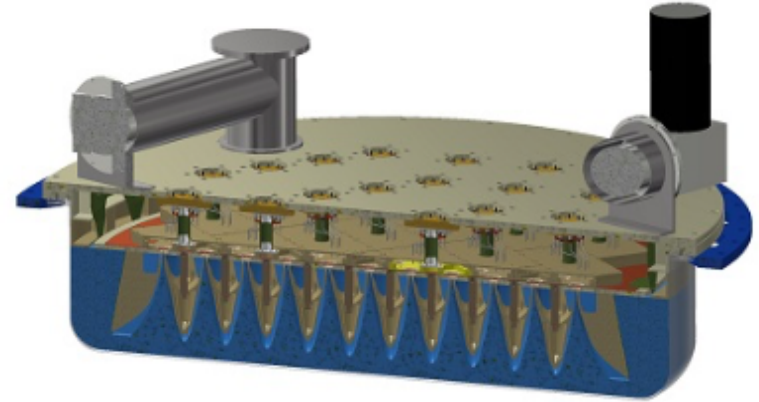
Telescope Operation System GUI

- Web based control system
- Utilises ASKAP TOS configured for single dish use
- In prototype phase currently
- scanning (referenced/OTF) not currently supported (but in progress)
- Name for it?
- <https://parkes-ops.atnf.csiro.au/UWL/login.jsp>



Cryogenically-cooled Phased Array Feed (Cryo-PAF)

- Waiting to hear on ARC funding announcement.
- Cryogenically cooled 'Rocket' Phased Array Feed (third generation CSIRO PAF)
- 700MHz – 2GHz capability (initial ASKAP bandwidth), 3 x MB field of view, sub-20K T_{sys}



Maintenance Updates

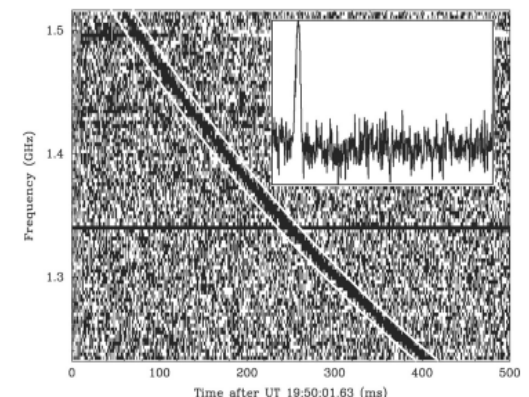
- Installation of platform and handrail structure to safely grease the zenith racks without the need for expensive Elevated Work Platforms.
 - Remote power control of hoist implemented
 - Fire pump control system infrastructure upgraded
 - Ongoing RFI mitigation investigations
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- Plan for MB translator work in March 2019 prior to re-install - to address occasional following errors on the Y2 platform slew ring (the platform rotator, normally not accessible as the MB receiver is usually bolted to it!)



Fast Radio Burst mode

ATUC response 8a May 2018

- Extensive details/discussion provided previously at ATUC via Evan Keane presentation (slides available online).
- Intention to run BPSR commensally when Multibeam is used (as per Breakthrough Listen and PPTA programmes)
- Intention to publish as ATEL / VOevent within ~ 1 hr of occurrence
- Option now on OPAL to select participation in the commensal observations (OPAL flag deselection to keep FRB data proprietary as per ATUC recommendation)
- We will continue to work on utilizing this mode in the coming semester (post MB reinstall)



Contract Time

ATUC response 9a May 2018 – impact on project allocations

BREAKTHROUGH LISTEN

- First pass of Galactic plane survey completed, second pass to start when MB returns
- Now working with student on analysing pulsar data
- Detected commensal FRB
- Currently gearing up for UWL observations
- Potential work on flare stars

~800hrs per semester



- To date, have confirmed 13 of FAST's 61 pulsar candidates (28 of which are visible from Parkes).
- 11 of the confirmed pulsars are now the subject of a long term timing and deep-study campaign.
- Use of the UWL over the coming months may bring additional confirmations.
- Listing of projects and PIs now provided online for projects other than pulsar confirmations.

~400hrs per semester

Contract Time

ATUC response 9a May 2018 – Impact on project allocations

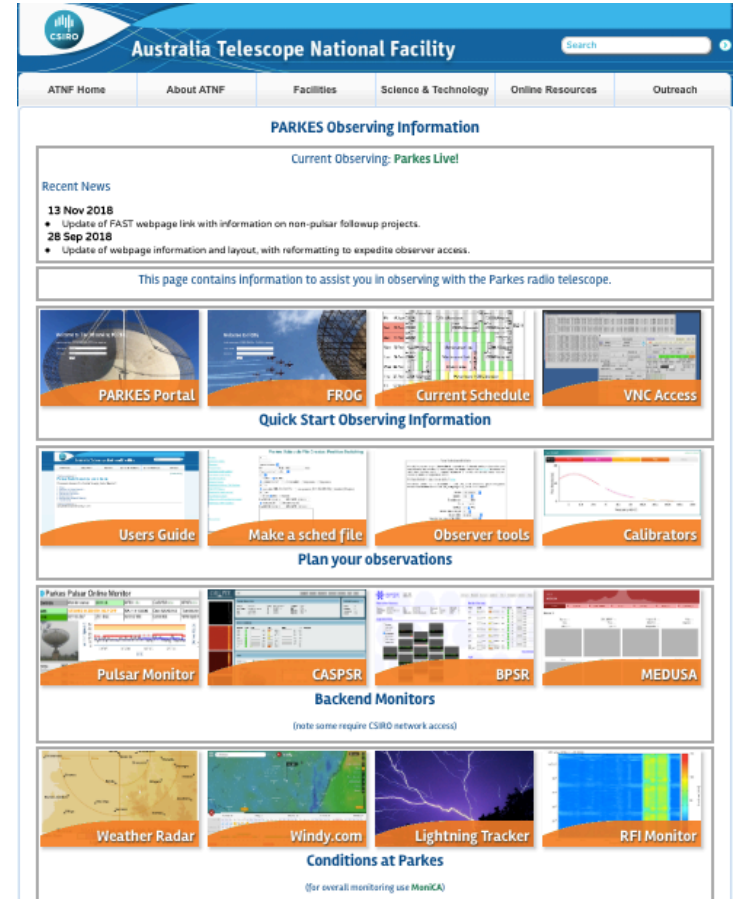
	2017 APRS	2017 OCTS	2018 APRS	2018 OCTS*
Contract	BL (1000hrs)	BL (850hrs)	BL+FAST (1220 hrs)	BL+FAST (1212hrs)
Other	(30 hrs UWL)	(40 hrs UWL)	(180 hrs UWL)	(400hrs UWL)
# of Proposals	26 (3600hrs)	19 (3100hrs)	33 (3400hrs)	36 (2750hrs)
Cutoff grade	3.6	3.7	3.7	3.4
Projects 90-100%	10	9	8	20
Projects 40-90%	5	3	7	7
Projects <40%	2	0	1	4
Projects 0%	9	7	17	5
Student PI success	33%	50%	50%	69%

*prior to NASA

Documentation – webpages

ATUC response 5a Nov 2017 - improving user knowledge and awareness

- Updated structure of main Parkes observer pages to improve accessibility, ease of use
- Added links/pages for Breakthrough Listen and FAST/NAOC, these will be developed to provide further information and status updates
 - Dedicated instance of OPAL for FAST projects set up
- Feedback on PORTAL welcome (link on login)



Documentation – guides

ATUC response 5a Nov 2017 - improving user knowledge and awareness



- Jane Kaczmarek (+ science ops team) coordinating an update of the Parkes Users Guide (PUG)
- Work in progress currently, old/out of date material being removed
- Temporary Google document for observers currently to assist with UWL – will be integrated with Users Guide for next semester
- Temporary Google document for observers to assist with TOS GUI usage – will be integrated with Users Guide for next semester
- Questionnaire on guide:
 - <https://www.cognitoforms.com/ATNF2/ParkesUsersSurvey>
 - Hard copies with Jane

Interim draft UWL user guide

Please note this is a temporary user guide to assist observers using the UWL in the first few weeks of operation following commissioning (November/December 2018). Once the system is stable, this guide will be removed and the usual users guide will be updated to reflect the information. This guide currently has instructions for using TCS and TOS - the expectation is that TOS will replace TCS for UWL observing over the next few months.

Note that this guide assumes that you have had formal observer training and understand the use of the PORTAL, FROG and TCS, i.e. it is purely to assist with UWL observing specifically. If you have issues with your observing then please remember to put in a Parkes fault report (email to parkes_support@csiro.au) and/or contact a local staff member.

What you need to know about the UWL

How to set up for UWL observations with Medusa and TCS

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TOS/UI User Guide for UWL

Please note this is a temporary user guide to assist observers using the Telescope Operating System User Interface (TOS/UI) in the first few weeks of operation following commissioning (November/December 2018). Once the system is stable, this guide will be removed and the usual users guide will be updated to reflect the information. The expectation is that TOS will replace TCS for most modes of observing with the UWL observing over the next few months.

Note that this guide assumes that you have had formal observer training and understand the use of the PORTAL and FROG, i.e. it is purely to assist with UWL observing specifically.

Access to TOS/UI

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Thank you

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