



ATCA Update

ATUC March 2023

Jamie Stevens | 2023-March-28

Australia's National Science Agency





I acknowledge the Gomeroi people, the Aboriginal traditional Owners of the land of the Paul Wild Observatory and pay my respects to Elders past, present and emerging. I recognise their connection to Country and their role in caring for and maintaining Country over thousands of years. May their strength and wisdom be with us today.



CA06 failure and repair

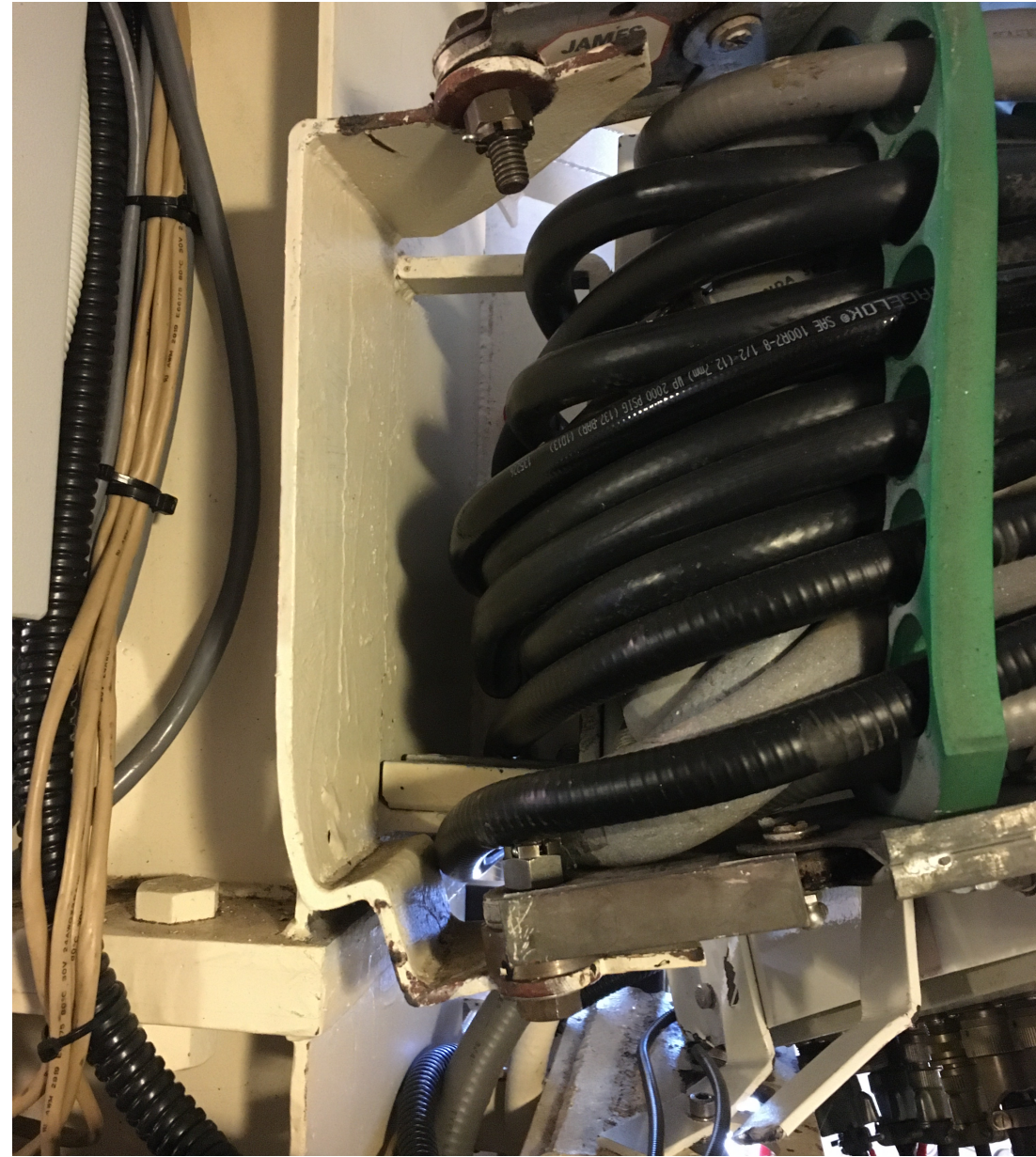
- On Jan 24 during regular observing, a cable snake bolt came out of its nut, and a subsequent turret rotation caused major damage to several systems
- The entire vertex room needed to be shut off, including electrical and cryo





CA06 failure and repair

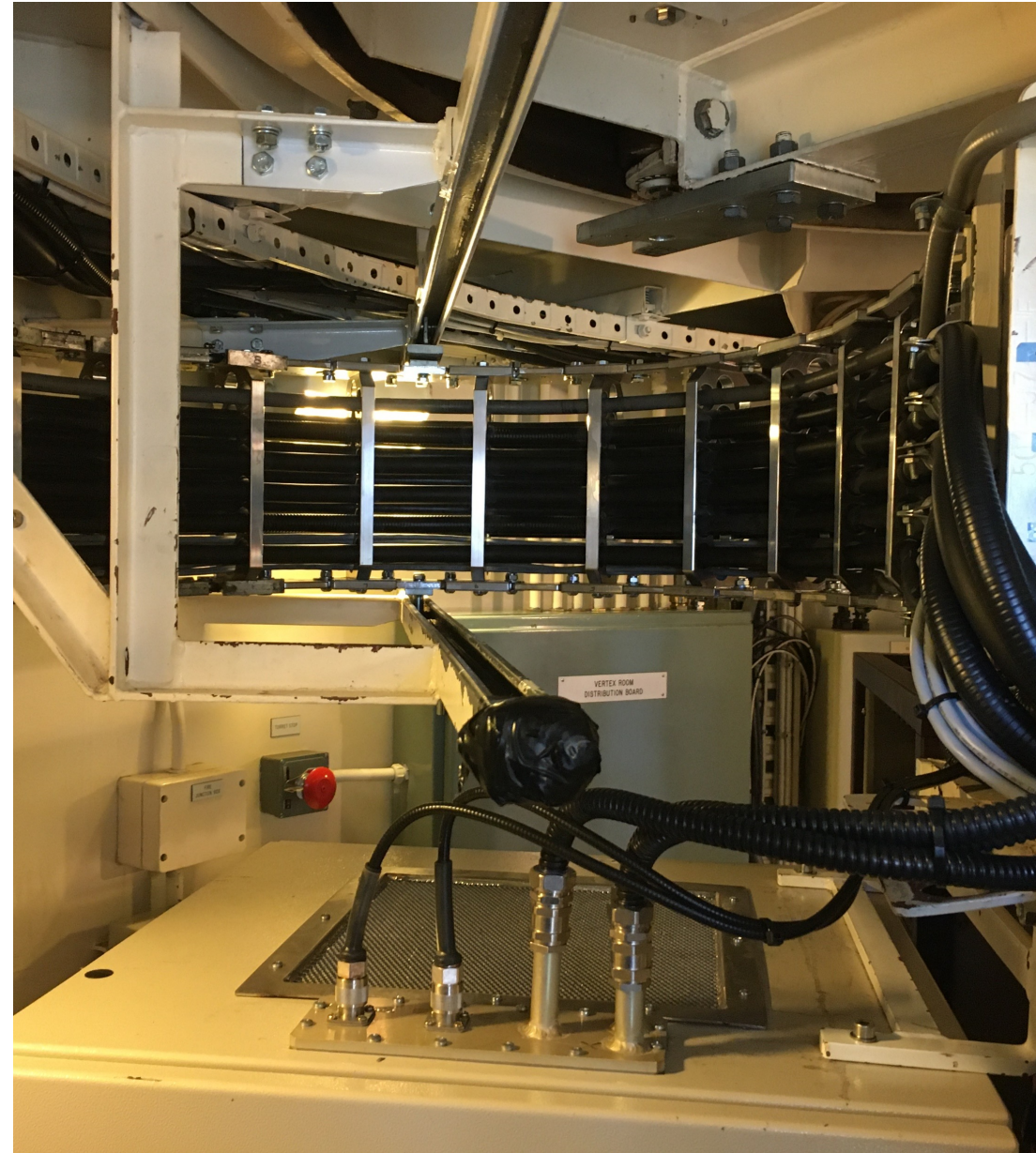
- Needed to get chain links made (external contractor)
- New power and signal cables bought
- New cable guides machined (by Marsfield machine shop)
- New design for turret junction box (Narrabri team)
- New cryo lines installed
- Metal work required to straighten the bent bits





CA06 failure and repair

- Brought back into service on Mar 23 (57 days after failure)





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CABB Status

- Change to CABB status
 - 4 blocks (2 in each IF) are incapable of forming reliable zoom bands
 - Continuum bands still producing reliable data
 - Pulsar binning mode now unavailable since two of the bad CABB blocks (1 in each IF) do not produce reliable continuum data in this mode
- 64 MHz zooms observations are scheduled in 2023APR
- VLBI mode scheduled and still working as expected



BIGCAT transition

- Since the BIGCAT install date is a moving target, the 2023APR semester is being scheduled in parts
 - First release covers Apr 1 to Aug 1
 - Next release will be no later than Jul 1
- Current estimate of installation is October
 - Likely then that we will keep the 2023APR semester as fully CABB
 - Currently cryoPAF, BIGCAT and QUASAR are due to complete around the same time, but this is too much workload for the required staff
 - If delays push the install date to December, likely have to push to February
 - Consequence of resourcing conflict between 3 major projects currently being planned



BIGCAT Update

- Jimble hardware has been produced
 - Firmware now being developed
- GPU coding, and surrounding monitor and control code well advanced
 - Work to output in (A)SDM format in progress, then we will make Miriad capable of loading it
 - Will work with CASA maintainers to ensure data can be used there also
- New scheduling tool being coded now
- Draft of commissioning plan done
- BIGCAT info meeting delayed until closer to the install date



new caobs

```
Terminal
CAOBS BIGCAT 0.1alpha Mar 15 2023 15:22:16 !!SIMULATION!!
UTC 2023-Mar-24 03:07:12.7 // LST 01:10:46.3 // MJD 60027.130008
```

CA01	CA02	CA03	CA04	CA05	CA06
SLEWING	SLEWING	SLEWING	SLEWING	SLEWING	SLEWING
201.6 54.0	201.6 54.0	201.6 54.0	201.6 54.0	201.6 54.0	201.6 54.0
69.6 s	69.6 s	69.6 s	69.6 s	69.6 s	69.6 s

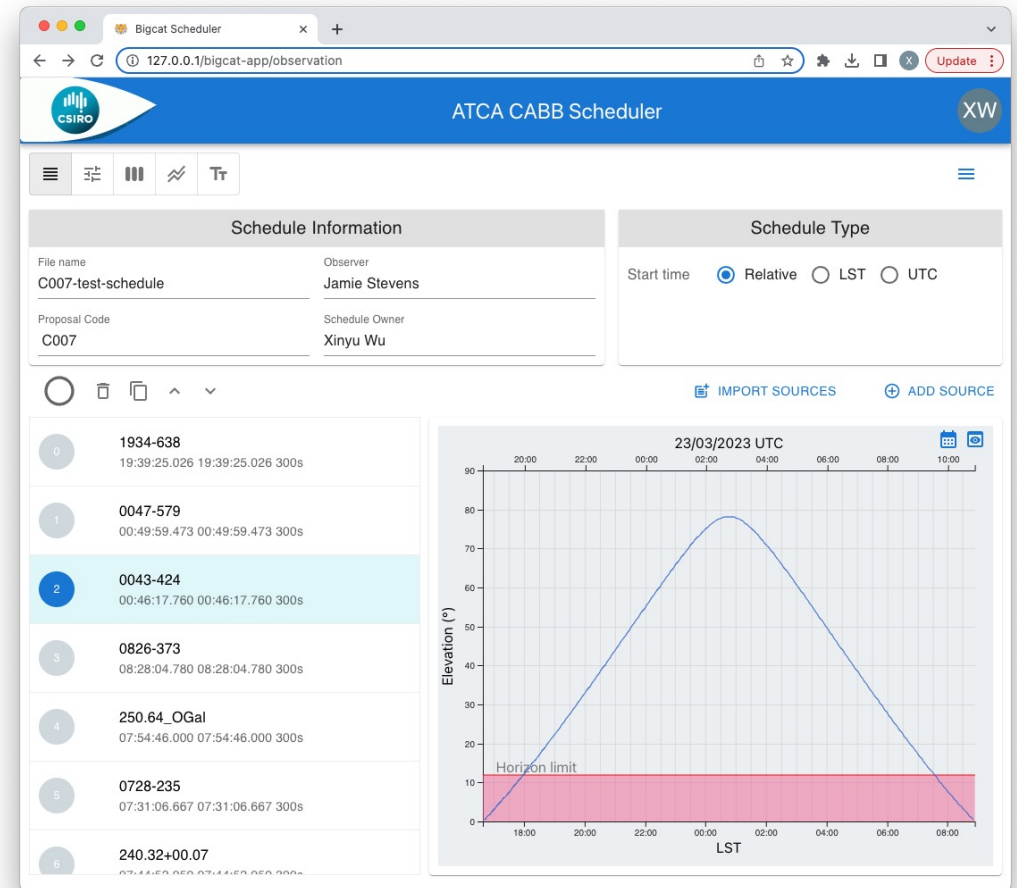
```
WEATHER: T=28.7 C P=1014 hPa H= 60 % S= 348 um W= 12 km/h
```

SUBARR1 setup_1934.sch				FREQ	RES
1934-638	19:39:25.0260	-63:42:45.6299	J2000	2100	1.00
1/ 38 NORMAL	00:09:59	03:08:20.4	-> 03:18:19.4	2100	1.00
PREP int	0				

```
03:06:09> set file setup_1934
03:06:53> track 1
CAOBS>
LOG MESSAGES
03:06:09: LOAD FILE 1 setup_1934
03:06:53: track 1
03:06:53: TRACK 1 1
```

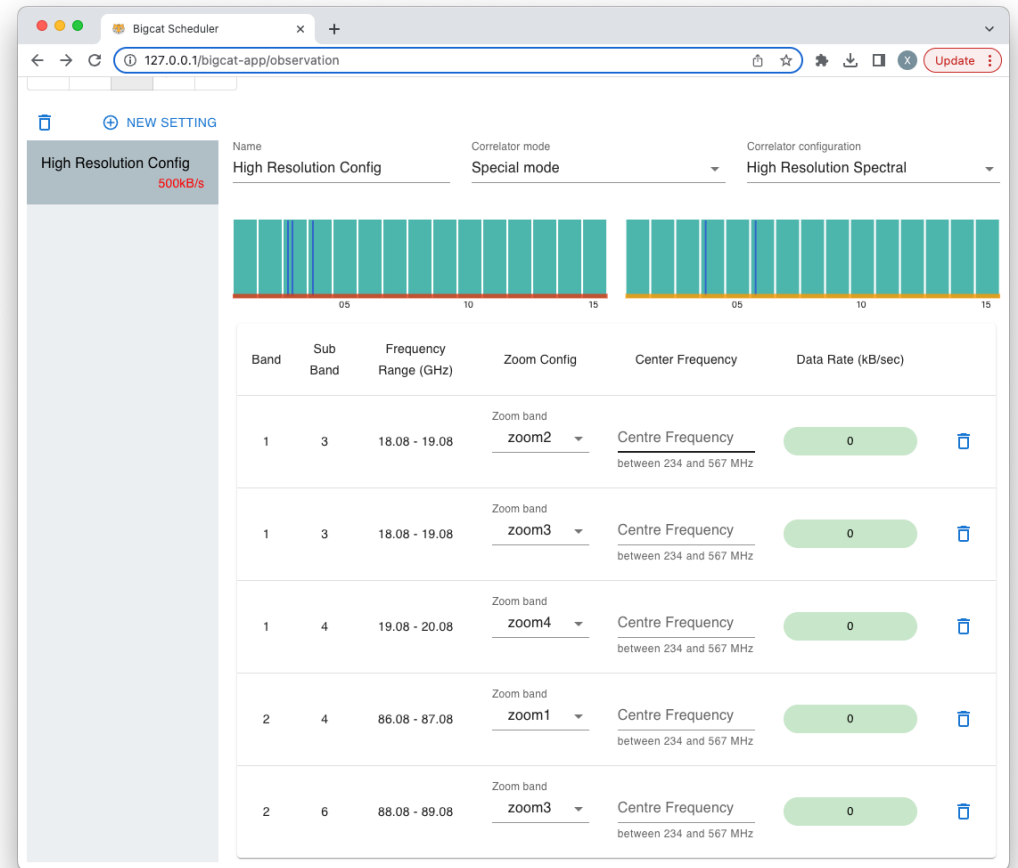



new scheduling tool



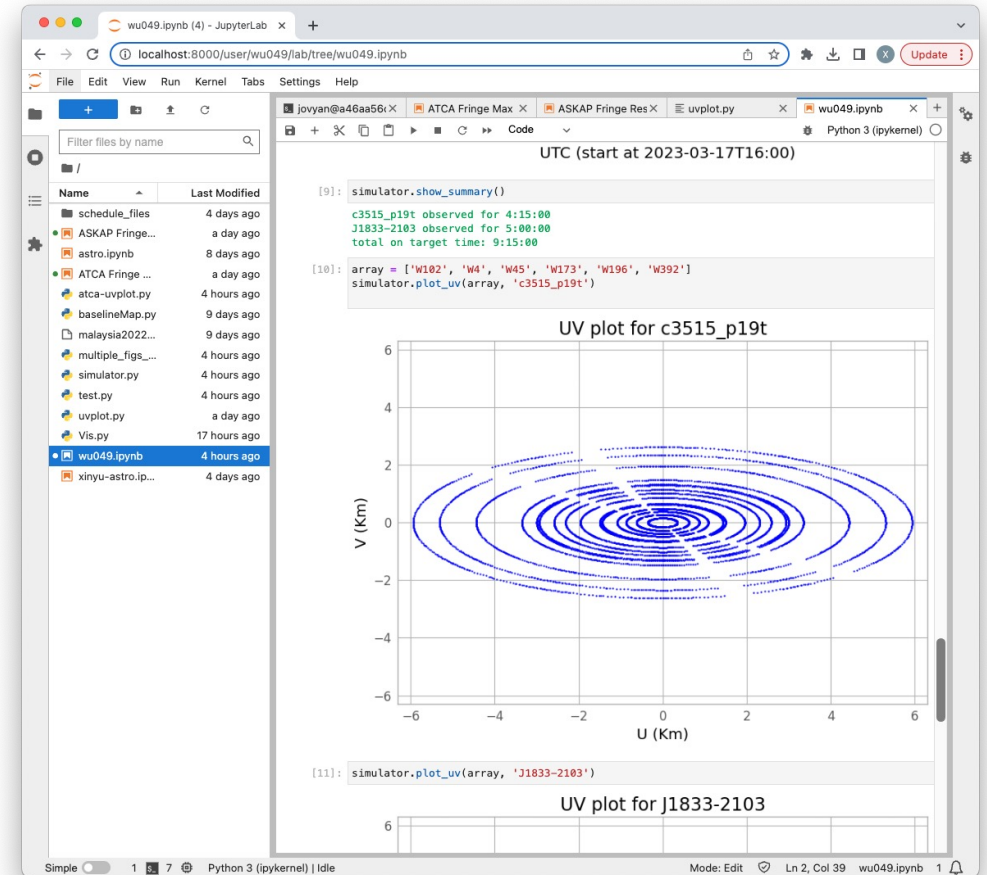


new scheduling tool





new simulator tool



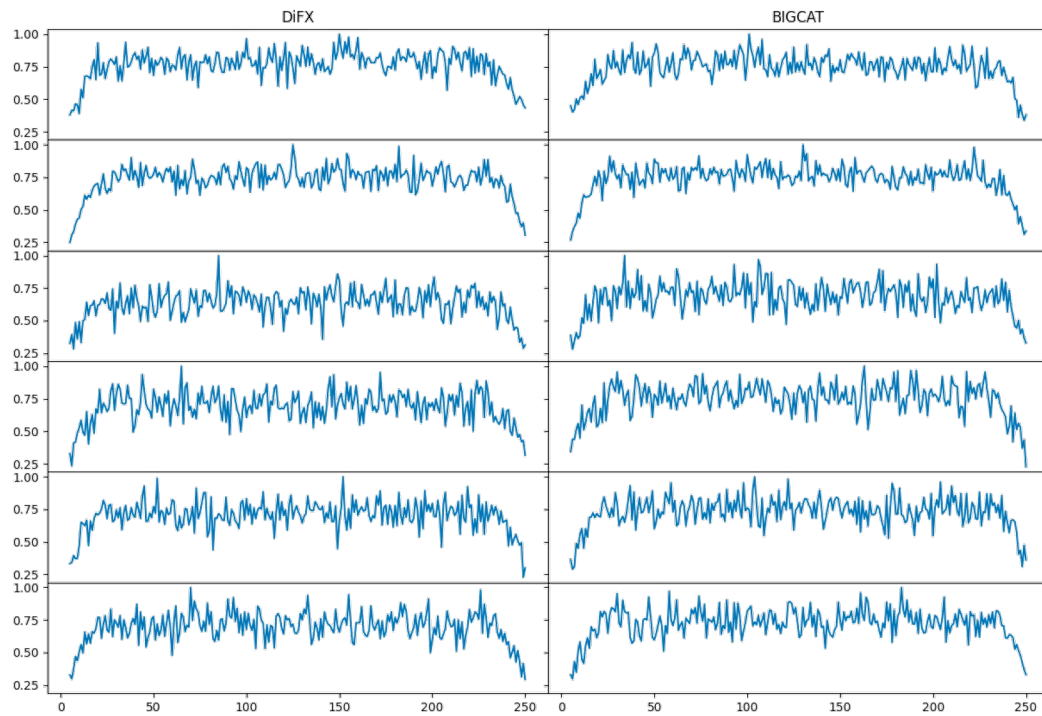


BIGCAT Verification

- ATCA & Mopra VLBI voltage data used for initial correlator comparison
 - 4 MHz bandwidth
 - Converted to CODIF complex data
 - Correlated with DIFX and BIGCAT pipeline
- Similar SNR for amplitude and phase (within noise)
- Similar phase characteristics



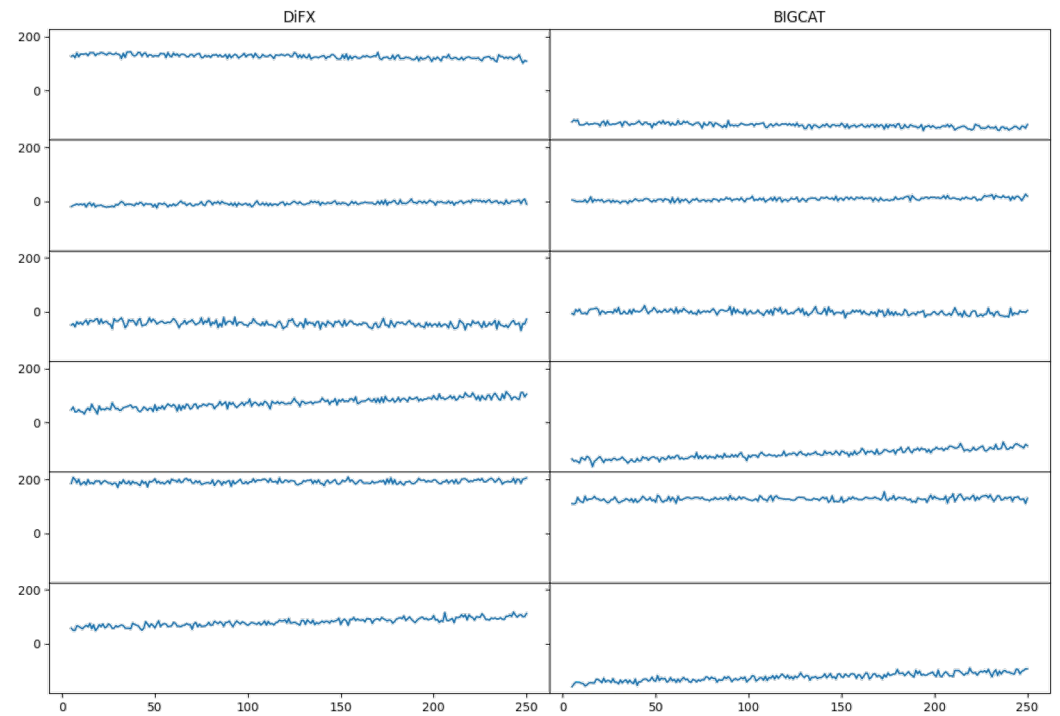
Scaled Amplitude vs Frequency



DIFX

BIGCAT

Phase vs Frequency

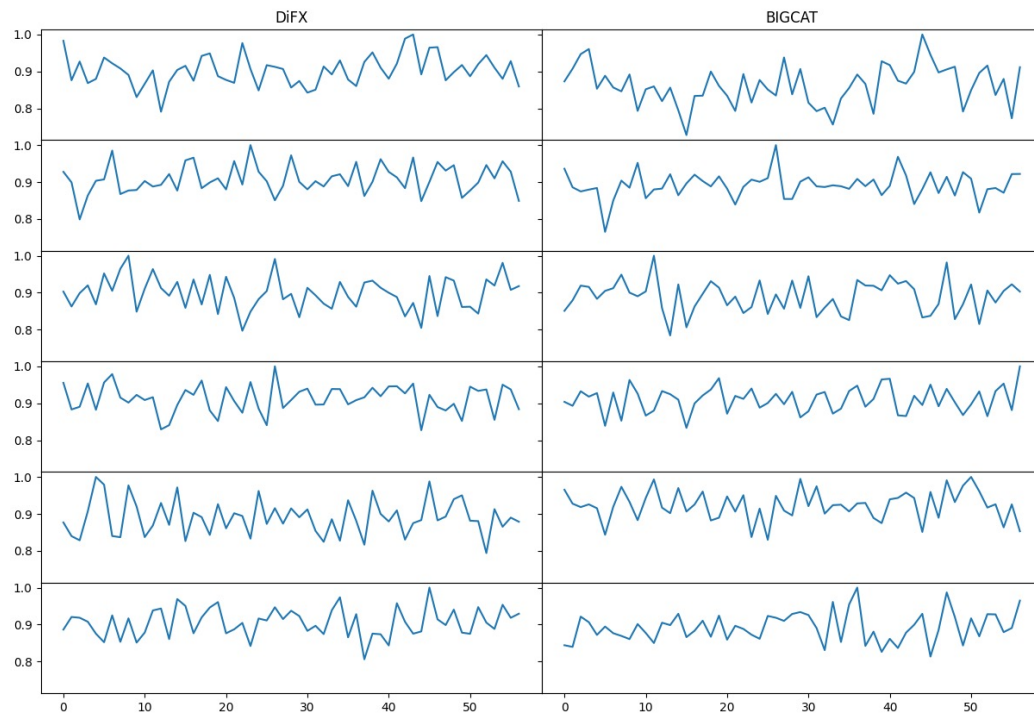


DIFX

BIGCAT



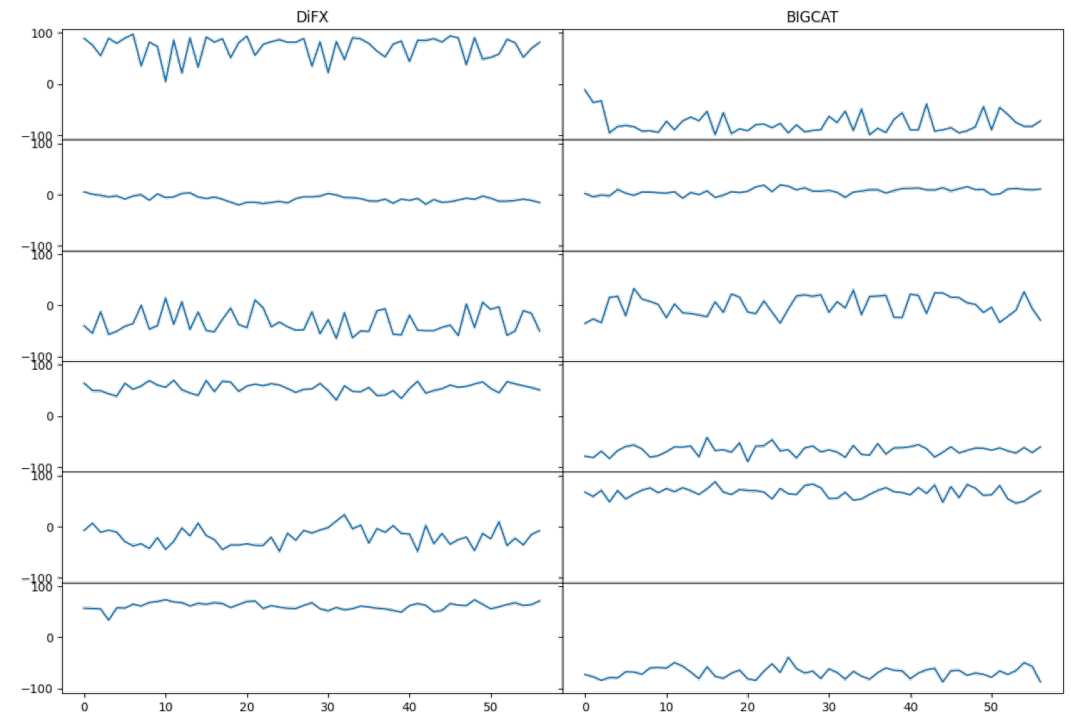
Scaled Amplitude vs Time



DIFX

BIGCAT

Phase vs Time



DIFX

BIGCAT



Thank you

Astronomy and Space Science

Jamie Stevens

ATCA Senior Systems Scientist

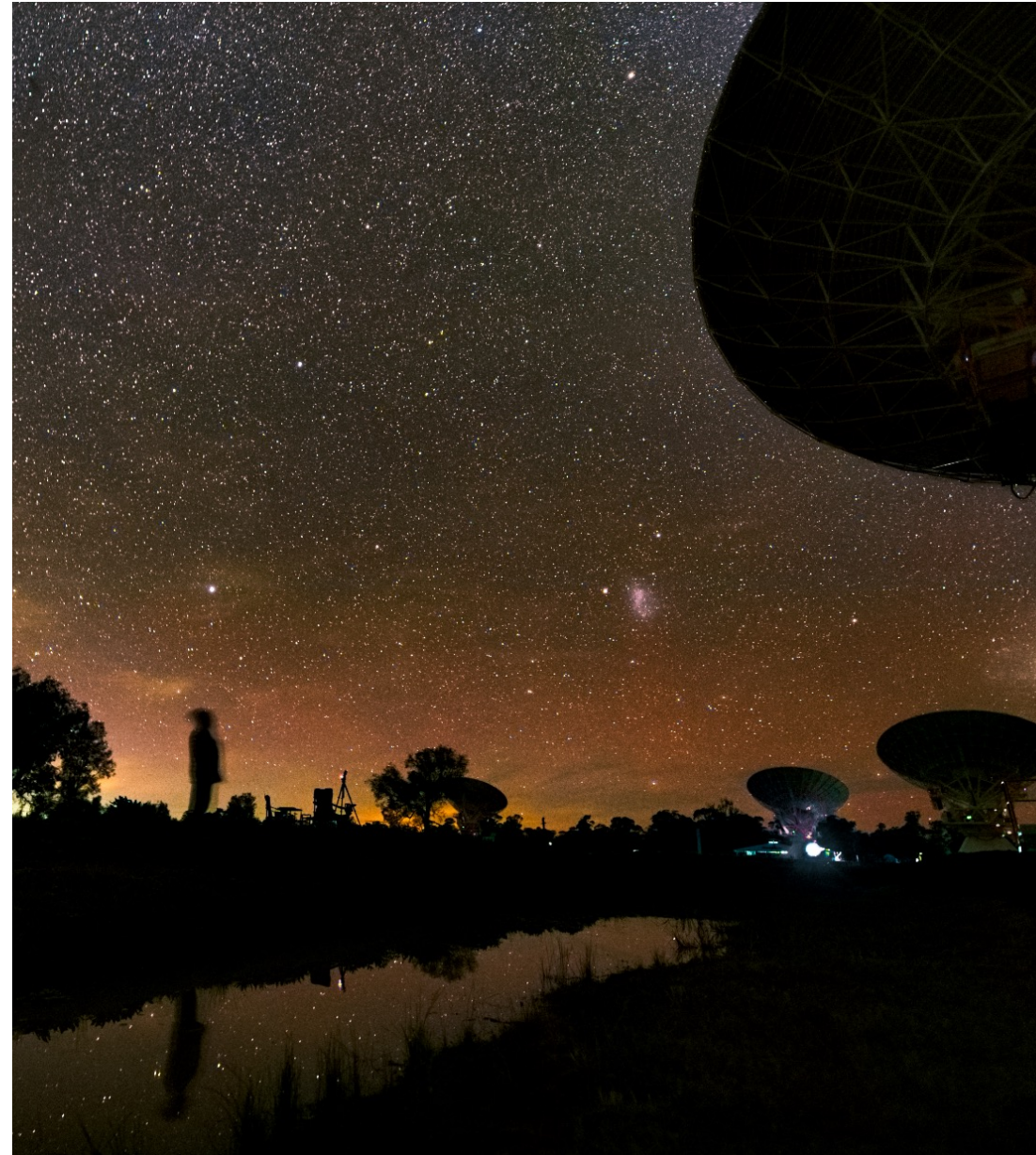
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Statistics

Project allocations for “normal” projects (who expect to get time in a single semester, excluding NAPA).

	2021OCT	2022APR	2022OCT	2023APR
# of Proposals	26 (1040 hr)	40 (2441 hr)	33 (2130 hr)	26 (1905 hr)
Cutoff Grade	3.3	3.2	3.1	3.0
Projects 90 – 100%	20	26	27	24
Projects 40 – 90%	1	3	0	0
Projects < 40%	0	3	1	0
Projects 0%	5	8	5	2



ASKAP-related projects

	2021OCT	2022APR	2022OCT	2023APR
# of Proposals regular	26 (1040 hr)	40 (2411 hr)	33 (2130 hr)	26 (1905 hr)
# ASKAP-related regular	4 (120 hr) [11.5%]	4 (176 hr) [7.3%]	8 (349 hr) [16.4%]	6 (400.5 hr) [21.0%]
# of Proposals NAPA	28 (1618 hr)	25 (1461 hr)	26 (1811 hr)	24 (1797 hr)
# ASKAP-related NAPA	1 (120 hr) [7.4%]	1 (120 hr) [8.2%]	1 (120 hr) [6.6%]	1 (120 hr) [6.7%]



NAPA Allocation

Semester	NAPA/ToO (hours) **	NAPA %	ToO %	ASKAP %
2022OCT	437 (14.4%)	79.0	21.0	6.5
2022APR	425 (13.7%)	65.6	34.4	7.6
2021OCT	555 (17.9%)	66.6	33.4	19.8
2021APR	528 (17.0%)	70.5	29.5	9.2
2020OCT	455 (14.7%)	62.1	37.9	9.2

** Percentages in “hours” column represent the fraction of the usable semester, which is roughly 3100 hours.