Slow transient activities in Australia

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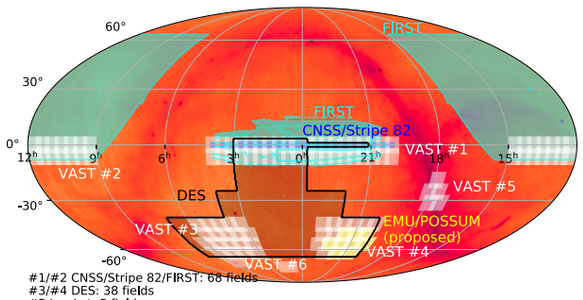
VAST is an open collaboration

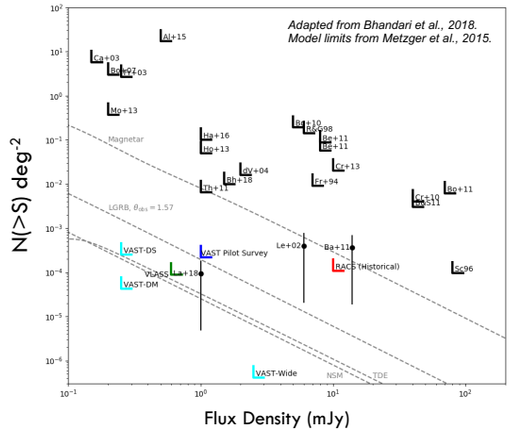
VAST Pilot Survey

- **6 pilot fields, 4 epochs**
  - 13 min/field/epoch = 250 μJy rms
  - Concentration on areas with good reference images at multiple wavelengths, in addition to other ASKAP projects (e.g. EMU).
  - Galactic and Extragalactic.
  - 4 epochs with 3 months cadence epochs.



#1/#2 CNSS/Stripe 82/FIRST: 68 fields
#3/#4 DES: 38 fields
#5 LowLat: 5 fields
#6 Magellanic: 2 fields
Total number of fields: 113
Assuming 4 epochs this gives 13.3 min/field/epoch

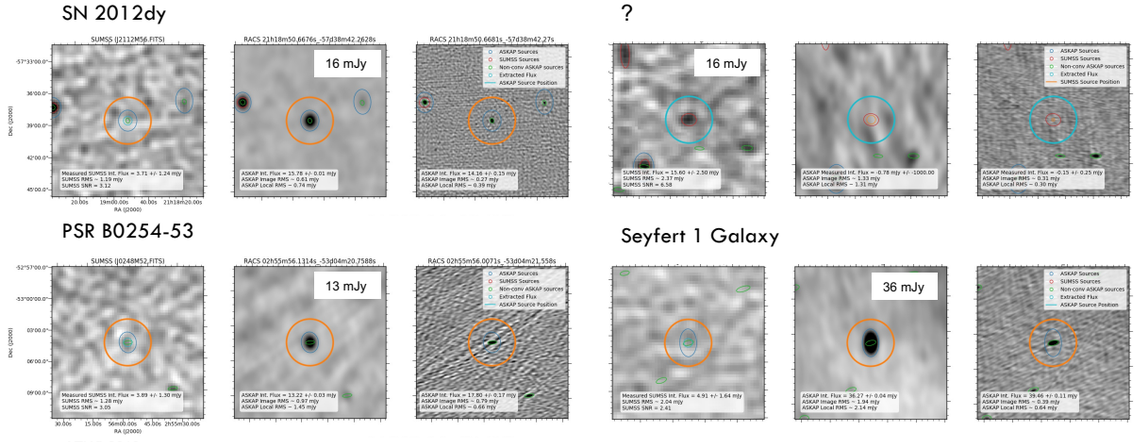
Produced by David Kaplan



Stewart et al., in prep.

VAST Ongoing Projects: RACS Historical Transient Search Examples

Left = SUMSS, Middle = RACS convolved, Right = RACS



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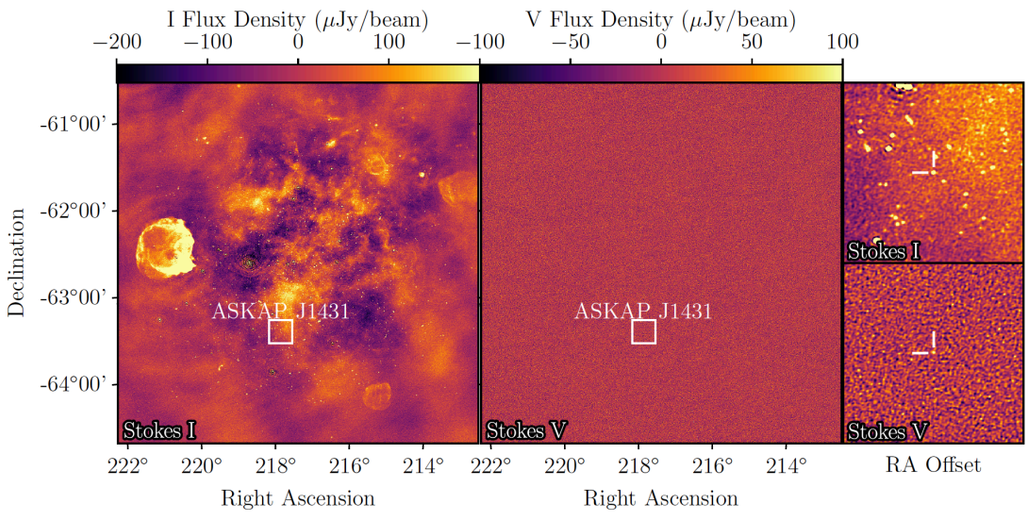
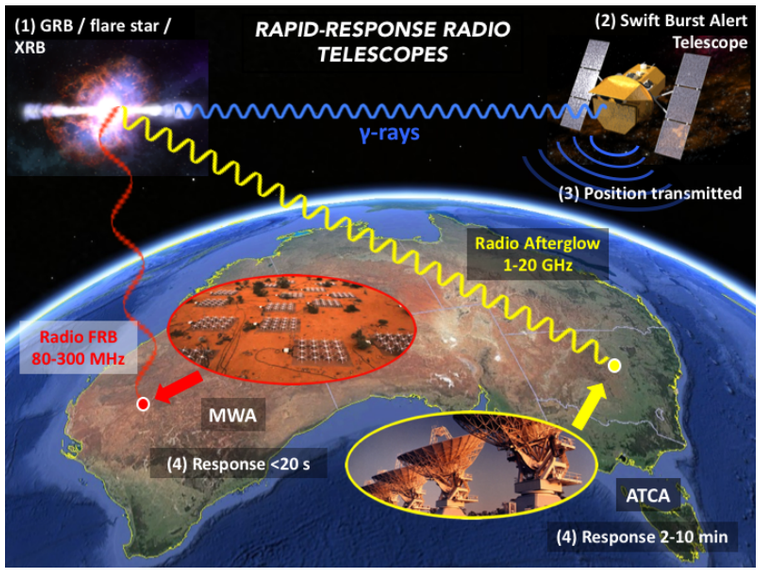
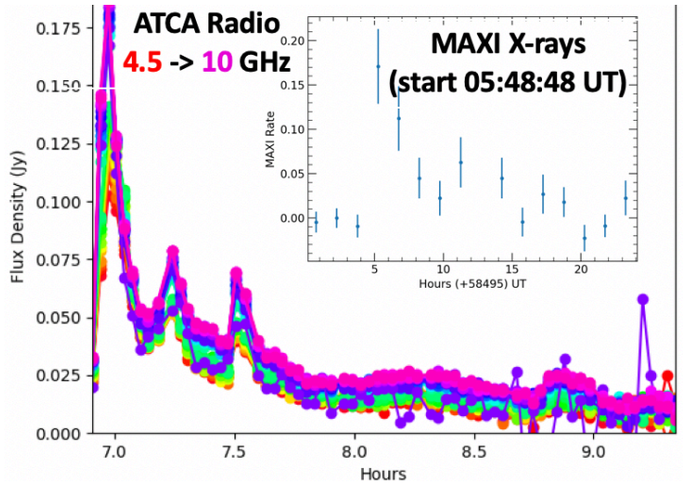
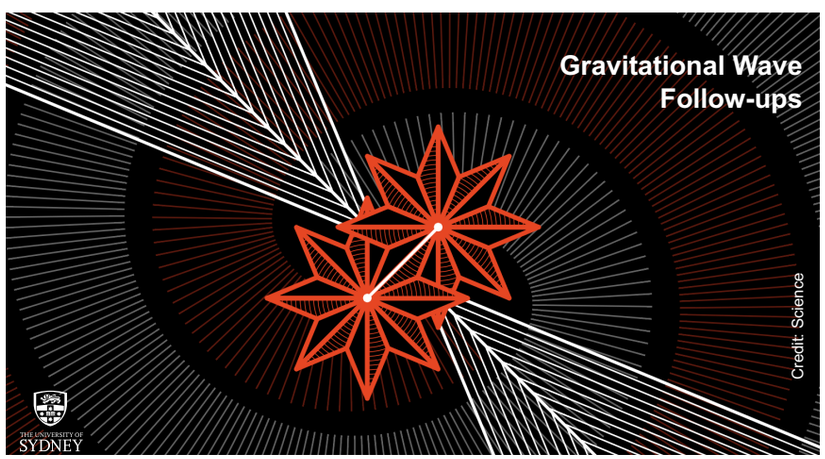
Page 8

VAST Serendipitous Discovery of PSR J1431-6328









Radio observing programs underway in LIGO O3

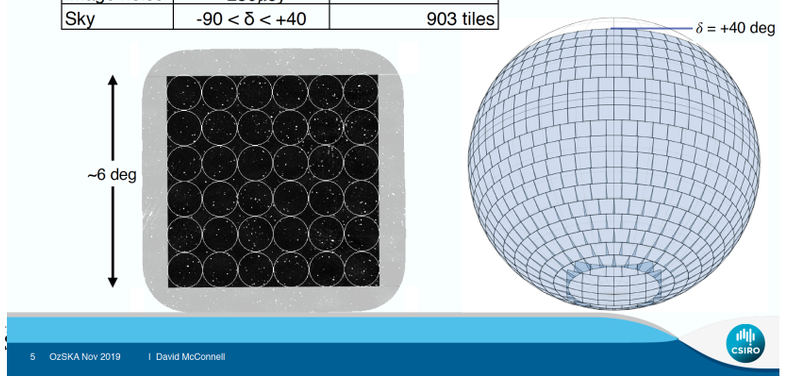
1) Australia Telescope Compact Array (ATCA) observing program
- 750 hours allocated over 5 semesters
- **Strategy 1:** galaxy targeting using CLU (Cook et al. 2017)
- **Strategy 2:** targeting candidate counterparts detected in other bands
- **Strategy 3:** long term monitoring of counterparts

2) Australian Square Kilometre Array Pathfinder (ASKAP) observing program
- 100 hours – pilot survey for radio transients
- **100 hours – GW time for follow-up when localization is poor**

3) Murchison Widefield Array (MWA) observing program
- Automatic triggering with latency 10s to ~1 minute
- May also search for long time scale afterglow – weak at low freq.

RACS - observing strategy

Baselines	22m - 6400m	All 36 antennas
Resolution	15 arcsec	
Frequencies	700 - 1800 MHz	288MHz bandwidth
Integration	15 minutes	
Image noise	~250μJy	
Sky	-90 < δ < +40	903 tiles



5 OzSKA Nov 2019 I David McConnell

Using Indian facilities for transient follow-ups?

Credits: RACS team