

Radio and Fink synergies

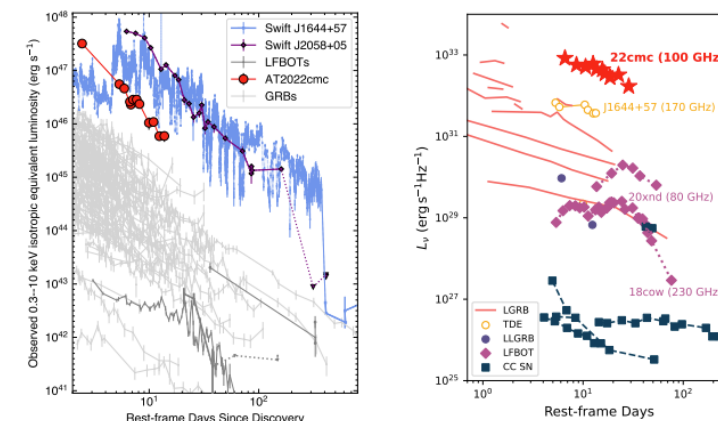
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Rubin-Radio Busy Days (USyd 4/5 Nov)

Discussion topic	Anais required	Emille required	Julien required	Julian required	Separate room required	Others attending	Comments
Supernova for radio follow-up filter + slack integration			x			Kovi, Iris, Kavya, Nichole, Surabhi	Kovi/Julien: channel created, bot created and installed. https://github.com/astrolabsoftware/fink-filters/issues/274
Kilonova simulations for Rubin						Iris, Dougal(?), Joshua, Nichole, Kovi, Surabhi, Kavya	
Star / galactic filter			x			Josh, Kovi, Iris	
(Bright?) Anomaly filter						Nichole, Surabhi, Kavya	
Crossmatching			x			Kavya, Surabhi, Joshua	
Guest programme	x					Dougal, Anais	
CASDA light-curve			x			Kovi, Qichen	CASDA integration in Fink portal: https://github.com/astrolabsoftware/fink-science-portal/pull/777
Creating watchlist for variable sources (real-time)			x			Rebecca	
Matched filter searches for VAST	x	?	?	x		Dougal, Surabhi, Iris, Kavya, Kovi	https://github.com/light-curve
Querying FINK API with the VAST pipeline			x			Dougal	

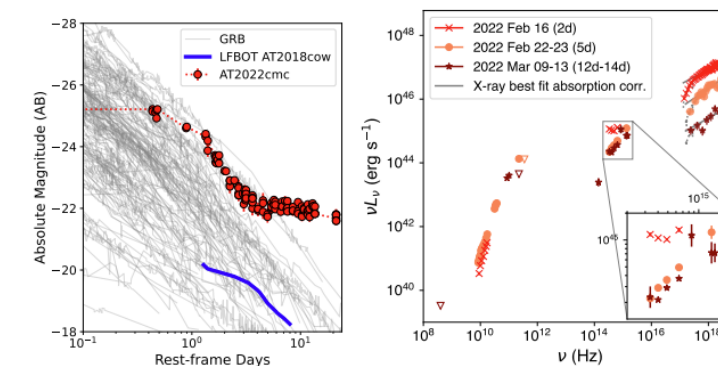
Why Radio?

- Energetics
- Environment
- Jets
- Late times



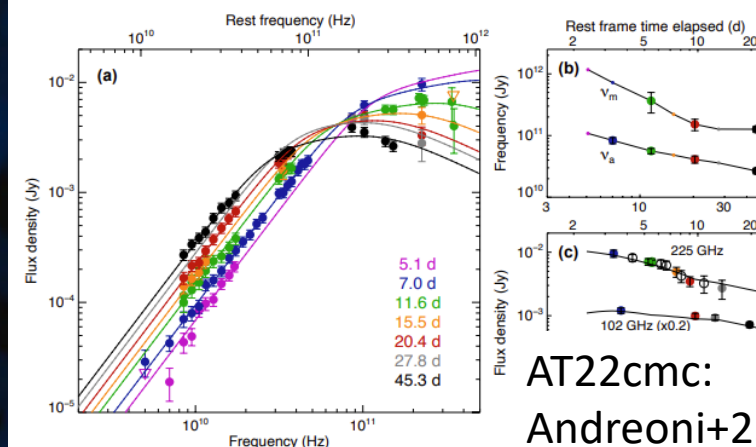
(a) X-ray light curve

(b) Millimeter light curve

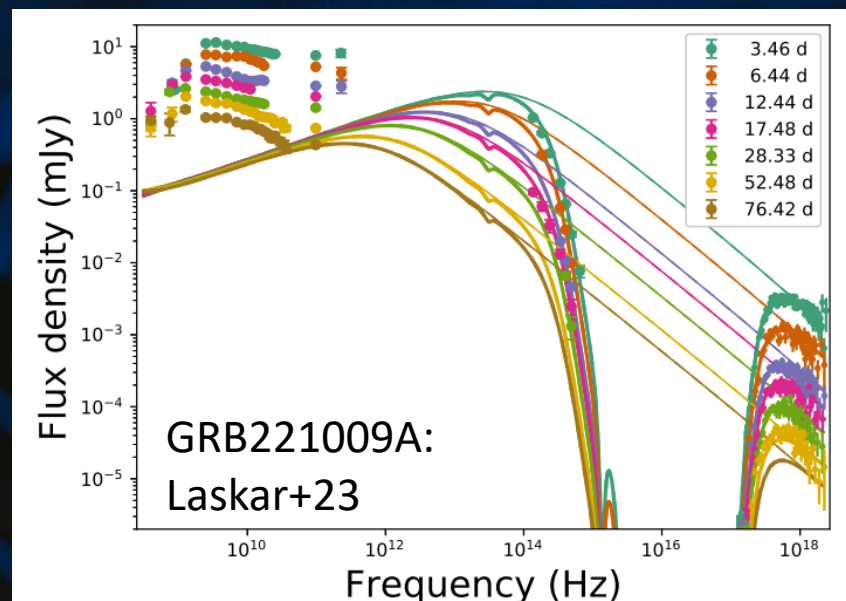


(c) Optical light curve

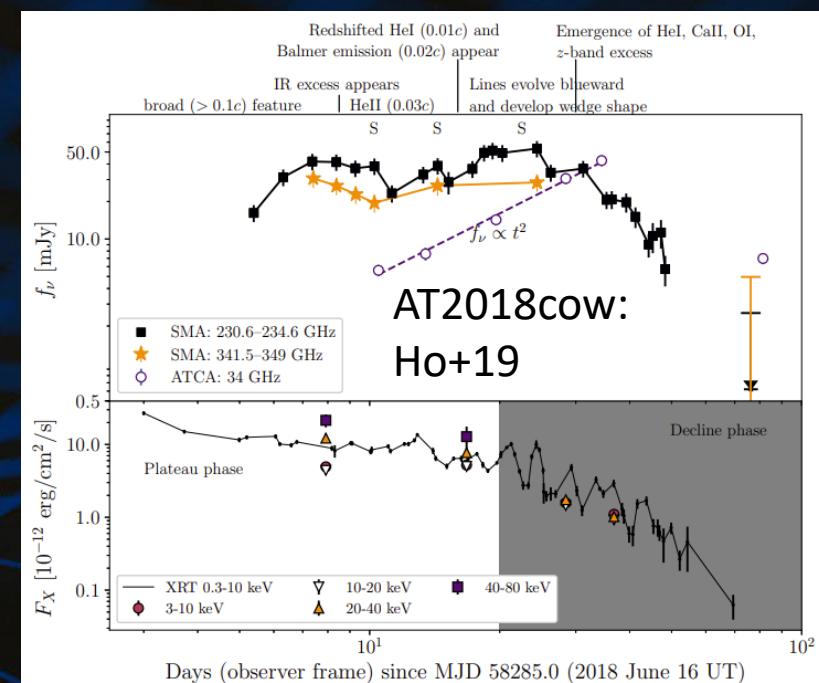
(d) Spectral energy distribution



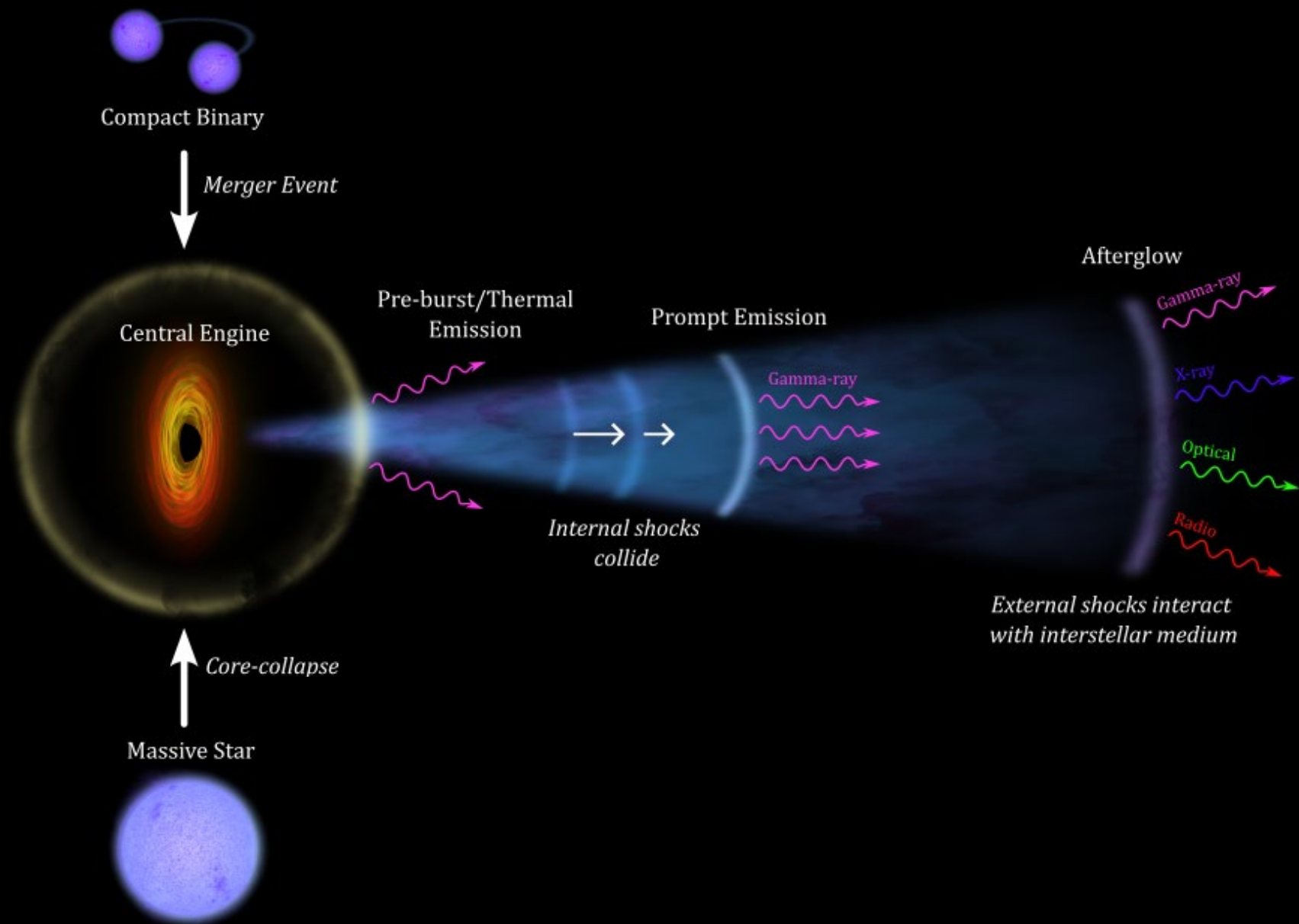
AT22cmm:
Andreoni+23



GRB221009A:
Laskar+23

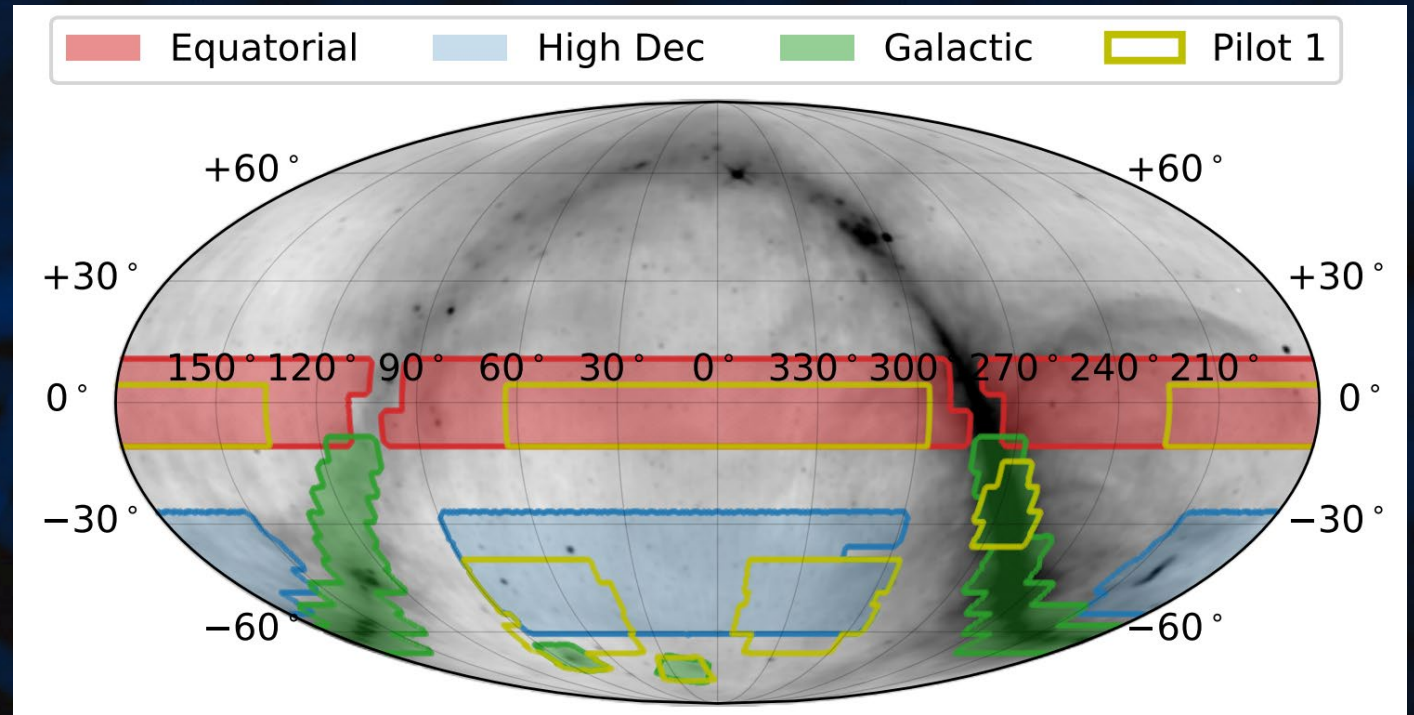


AT2018cow:
Ho+19

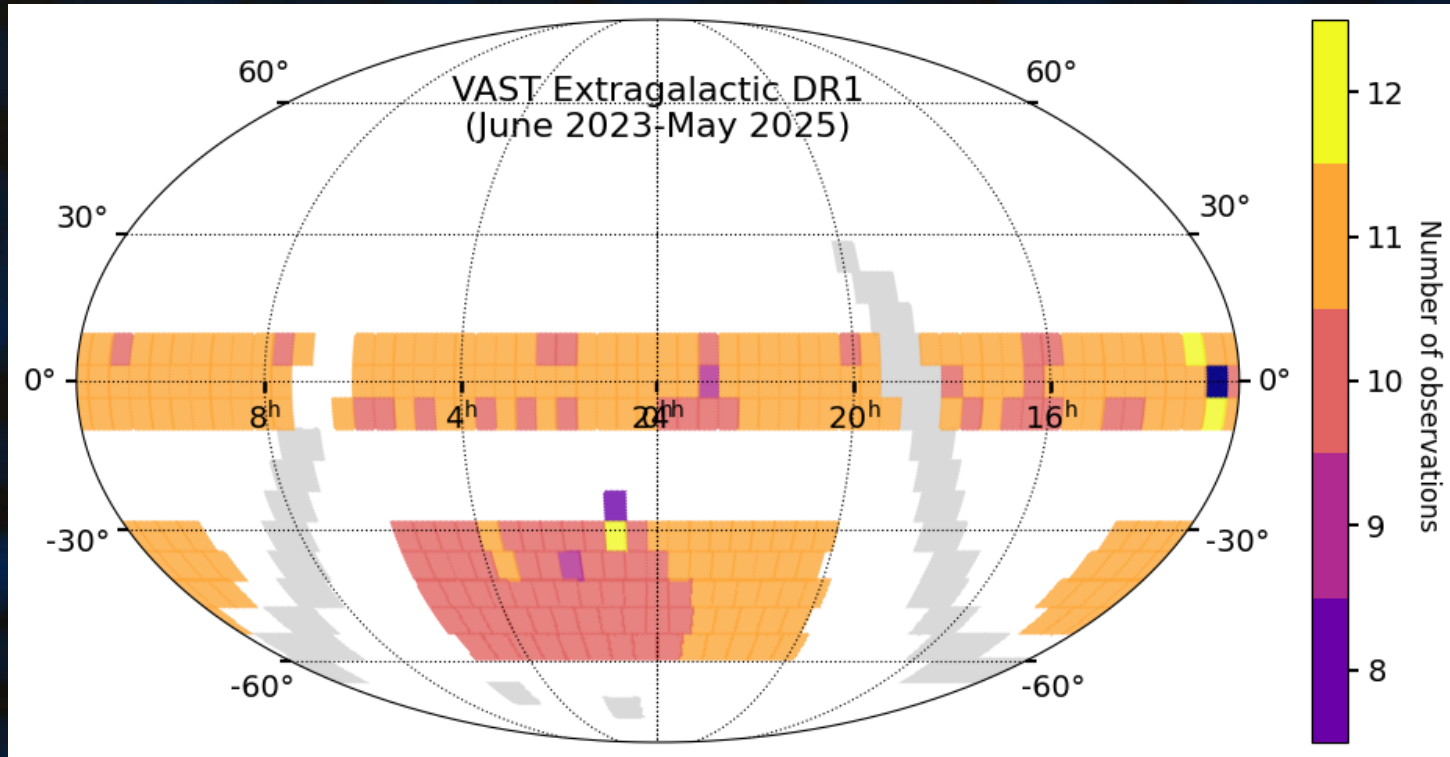


Variables And Slow Transients (VAST)

- 12 minutes/250 uJy @ 888 MHz – 2168 h total
- Galactic
 - 2 years fortnightly monitoring of GP
 - ~400h remaining (strategy TBD)
- Extragalactic
 - 4 years bi-monthly monitoring of 274 fields

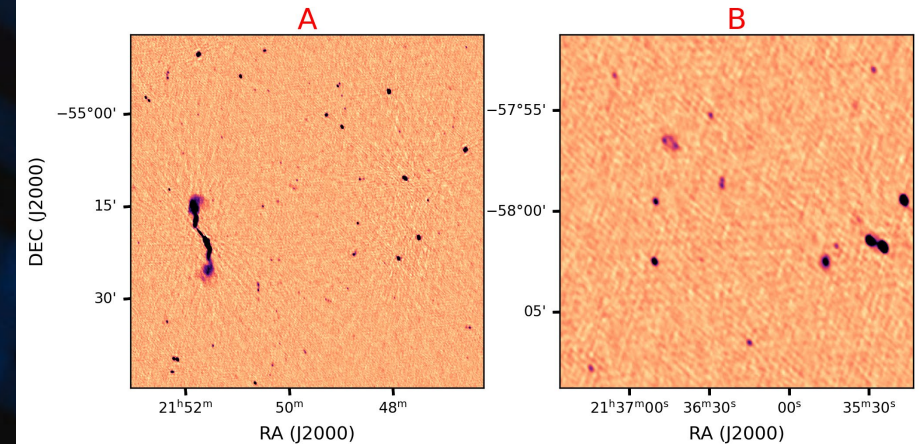
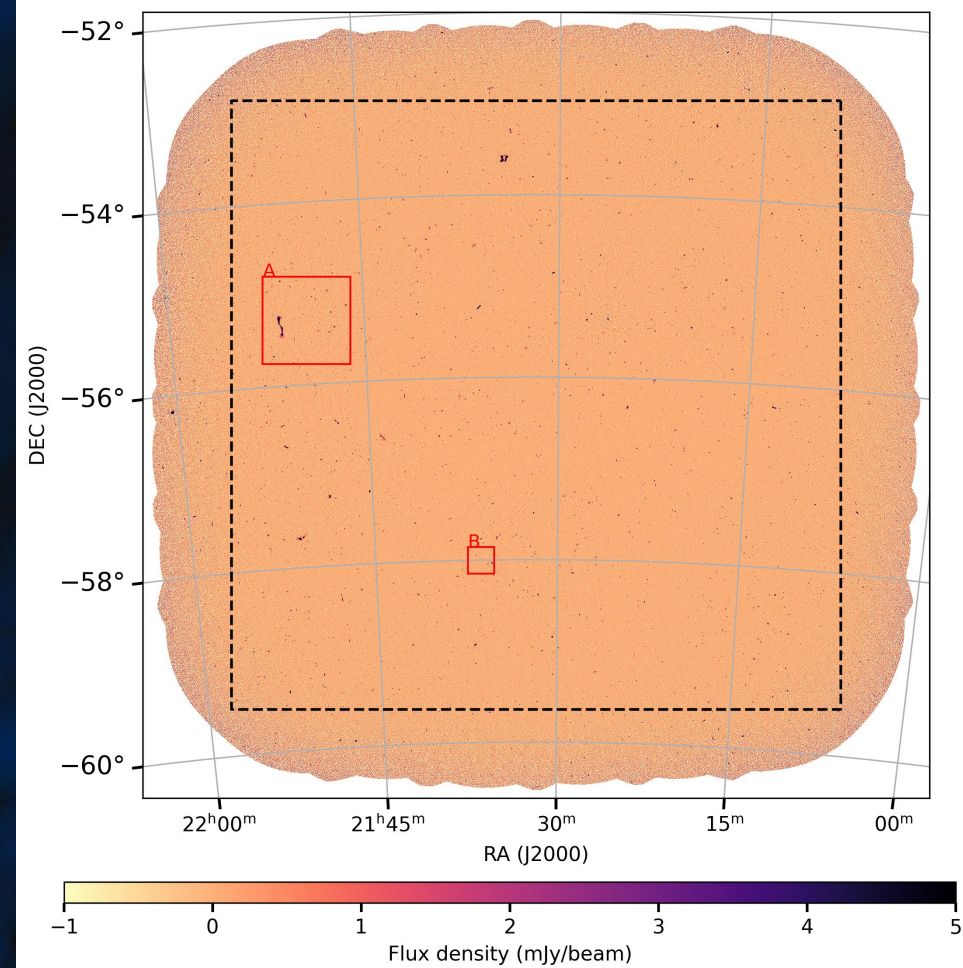
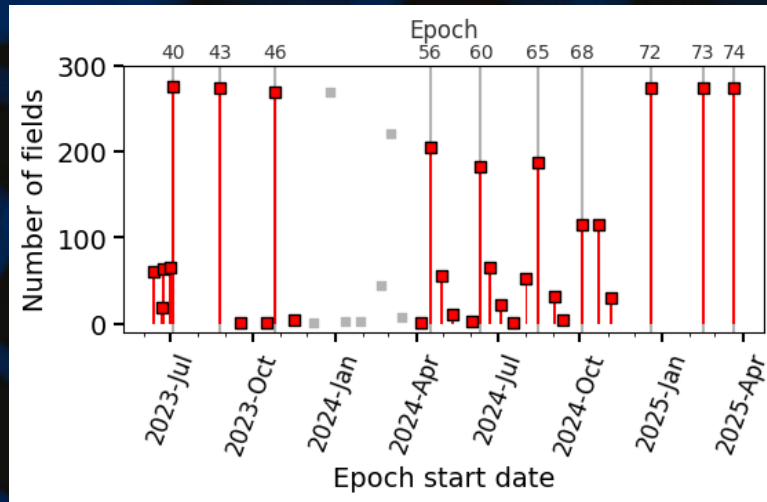


VAST DR1 – de Ruiter et al.



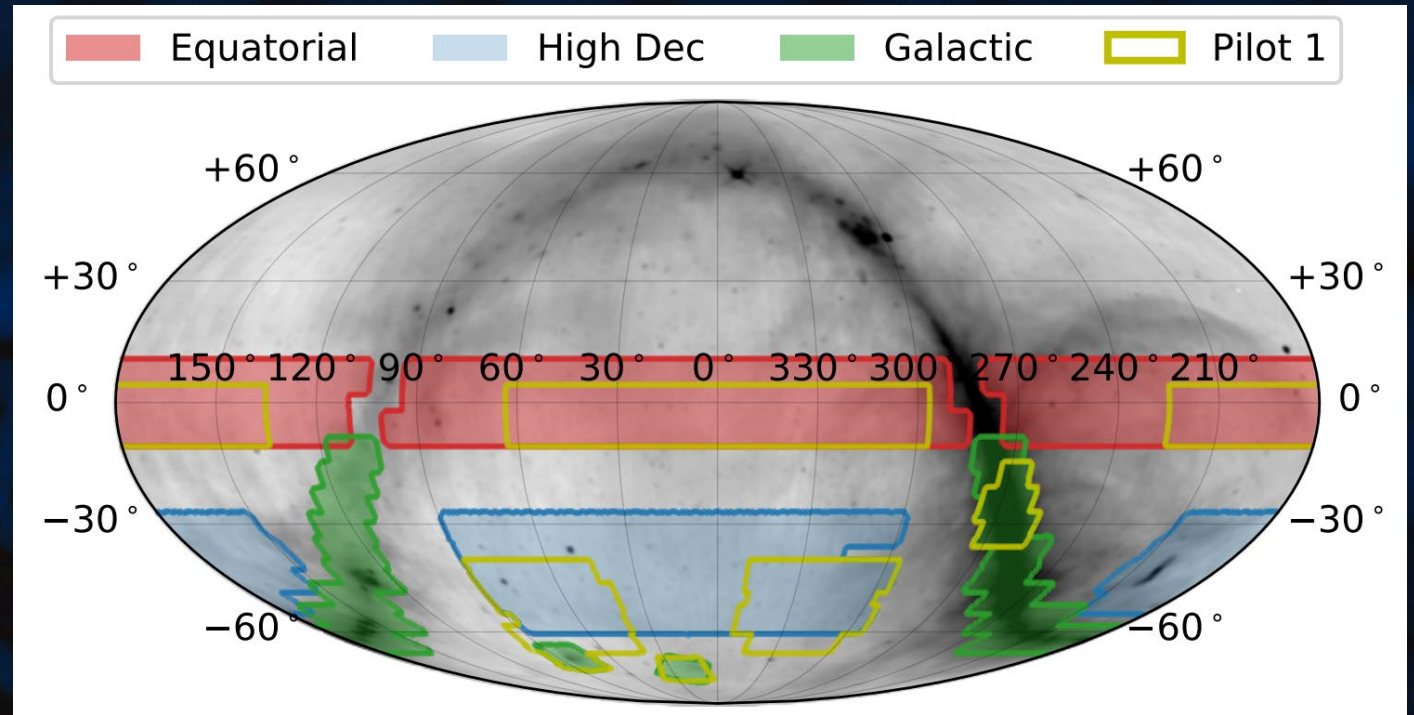
Catalogues, cutouts
and lightcurves:
early 2026

Dedicated webapp:
late 2026



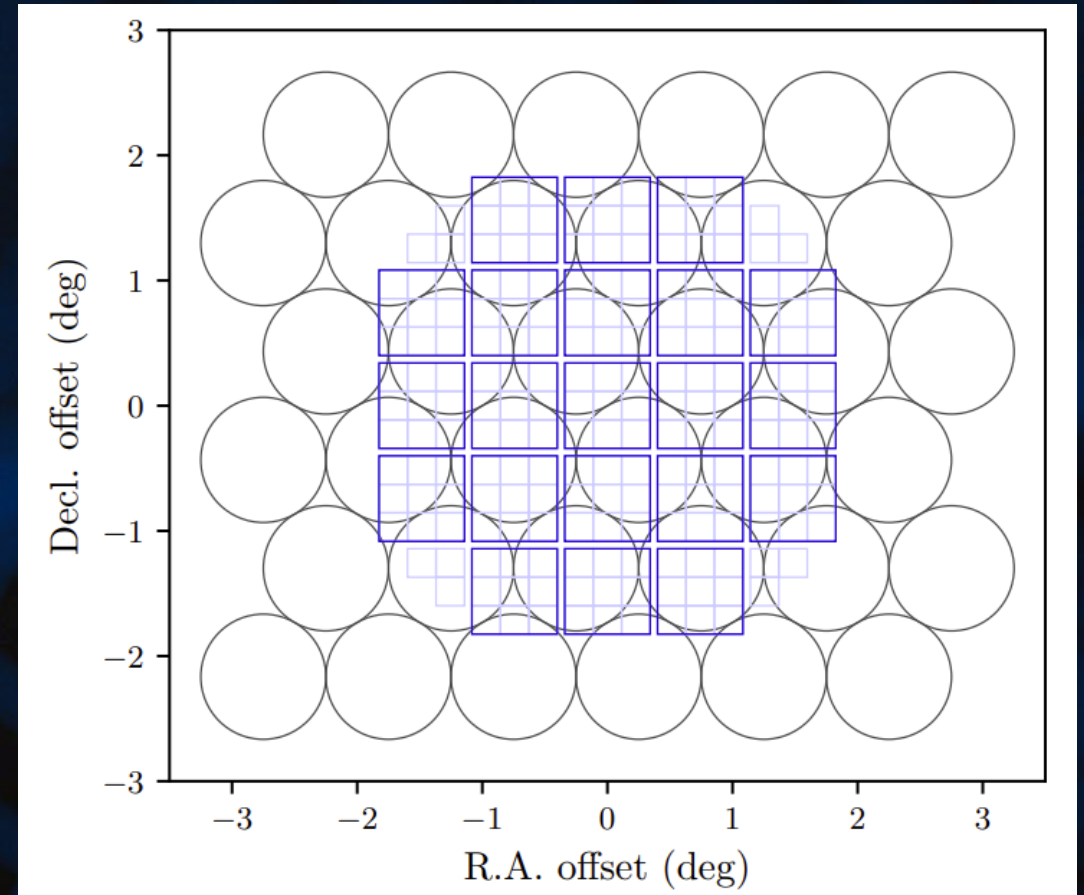
Variables And Slow Transients (VAST)

- End mid-2027
- Does Rubin present motivation to extend further?



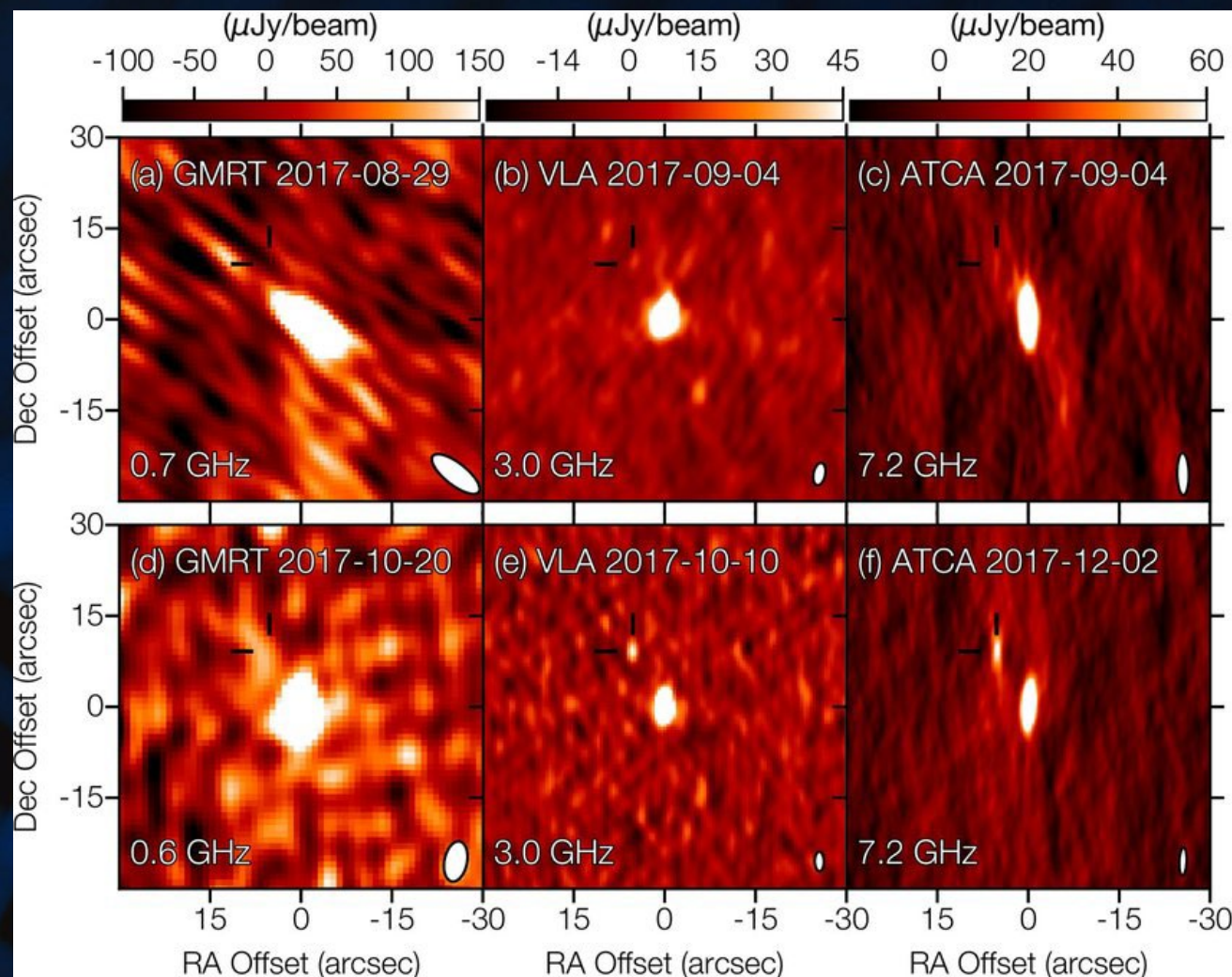
Deep Drilling Fields

- ASKAP Guest Science:
 - Small projects
 - ~100/year available
- AS310 – “A radio reference”
 - ELAIS-S1, COSMOS, ECDFS
- Is there demand for more?
 - Regular monitoring?

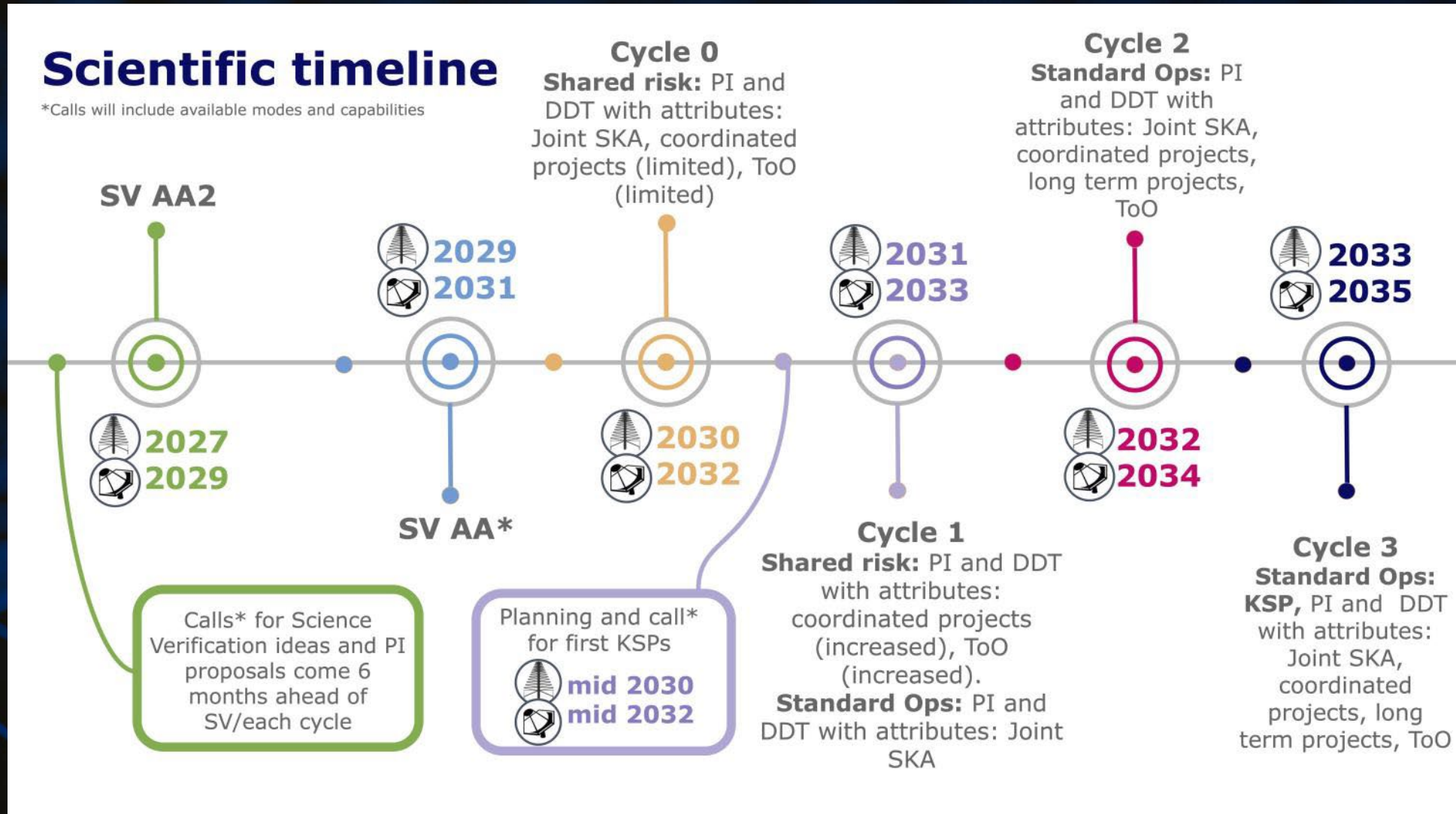


Targeted follow-up

- ATCA: 2.1-100 GHz
 - “easy” ToO/NAPA program
 - Funding shortfall – may close mid-2026
- VLA: 2-100 GHz
 - DDT available ToO via queue
- MeerKAT: 0.8-3 GHz
- Why?
 - Sensitivity + freq coverage

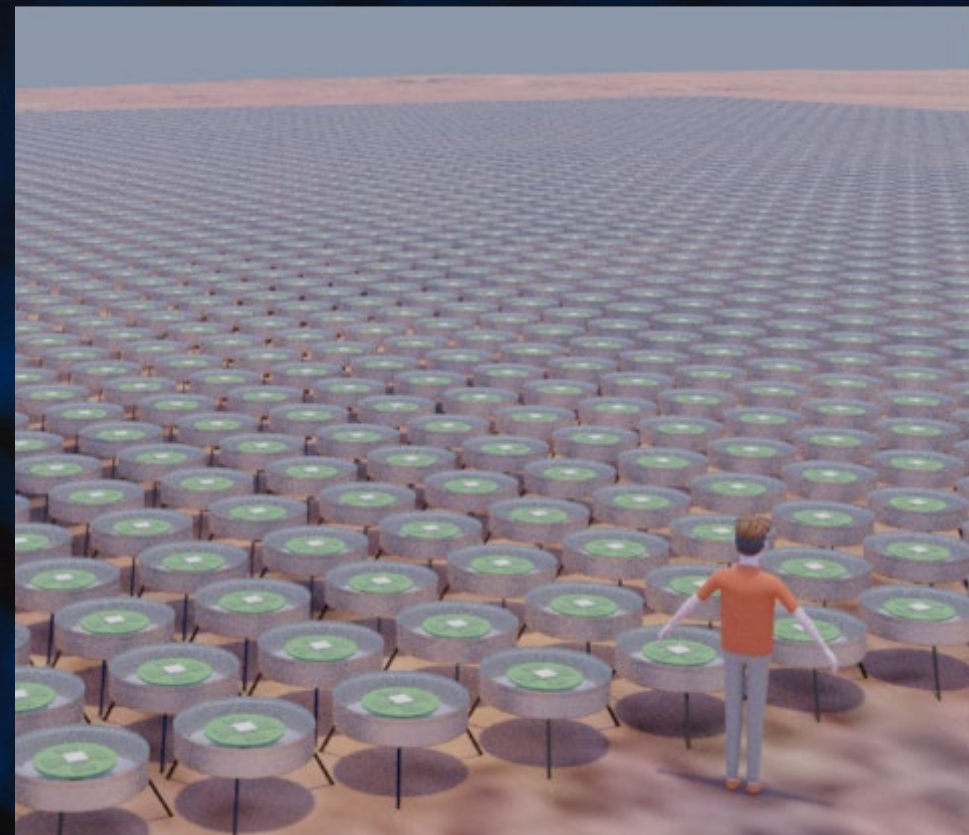


The Square Kilometre Array



CASATTA: all sources, all the time

- Deep(ish) weekly image of the entire sky
- High cadence helps classify scintillators and AGN
- Detection rates more dependent on area vs depth
- Follow-up is free (although require multi-wavelength)



Summary

- Radio provides key information for many transient classes
- What observations do we need?
- How can we optimise those observations?