SKA Transients

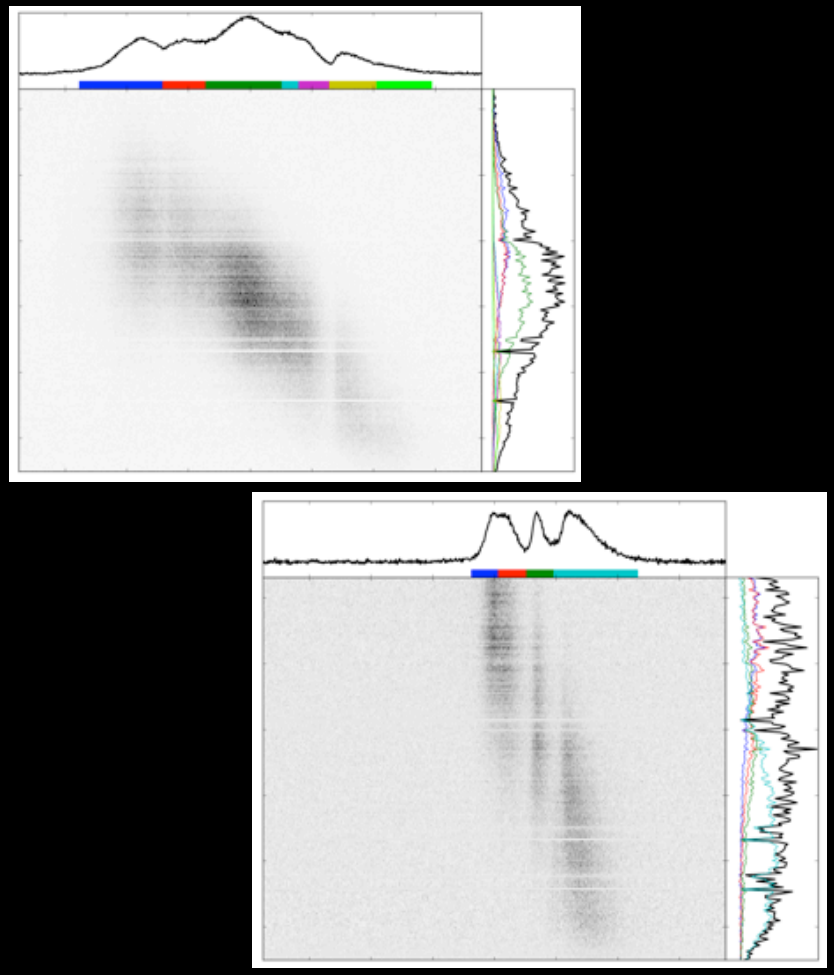
Science Working Group

Jason Hessels
(ASTRON/UvA)

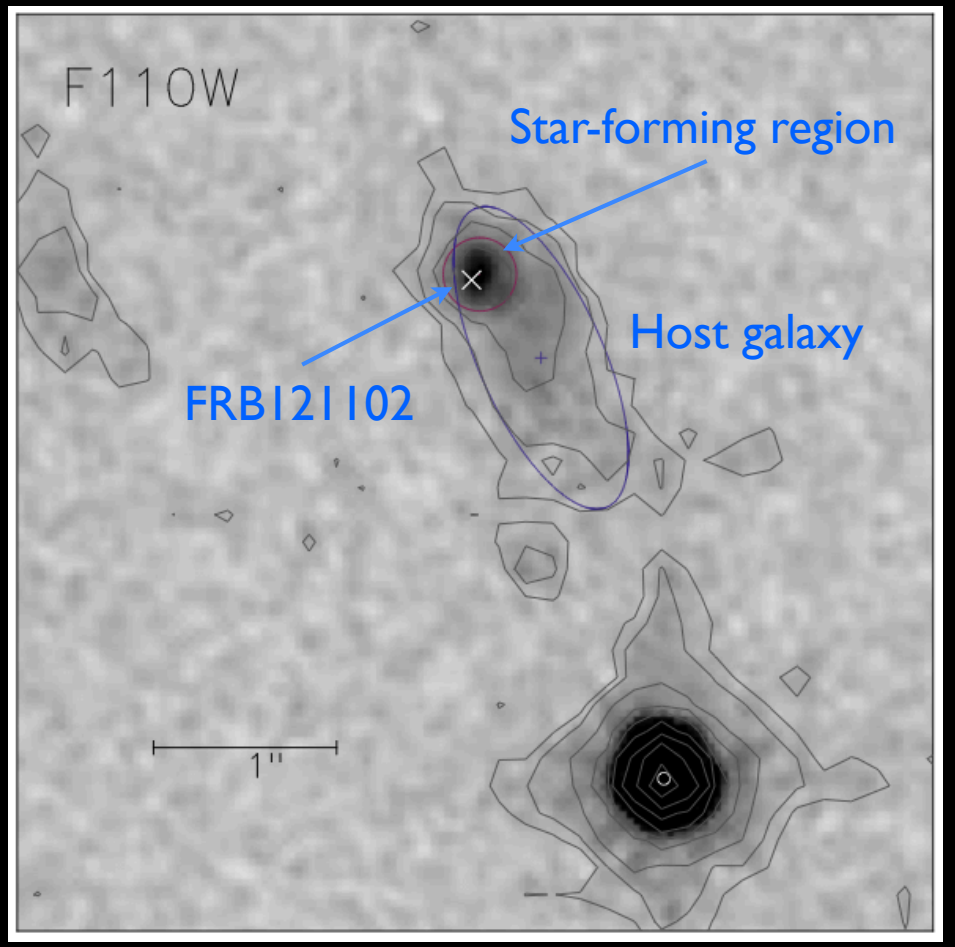
SKA-NL Meeting 24/05/2018

Recent science highlights

(bias to NL work)



Hessels et al. 2018



Chatterjee et al. 2017
Tendulkar et al. 2017
Marcote et al. 2017
Bassa et al. 2017

Recent science highlights

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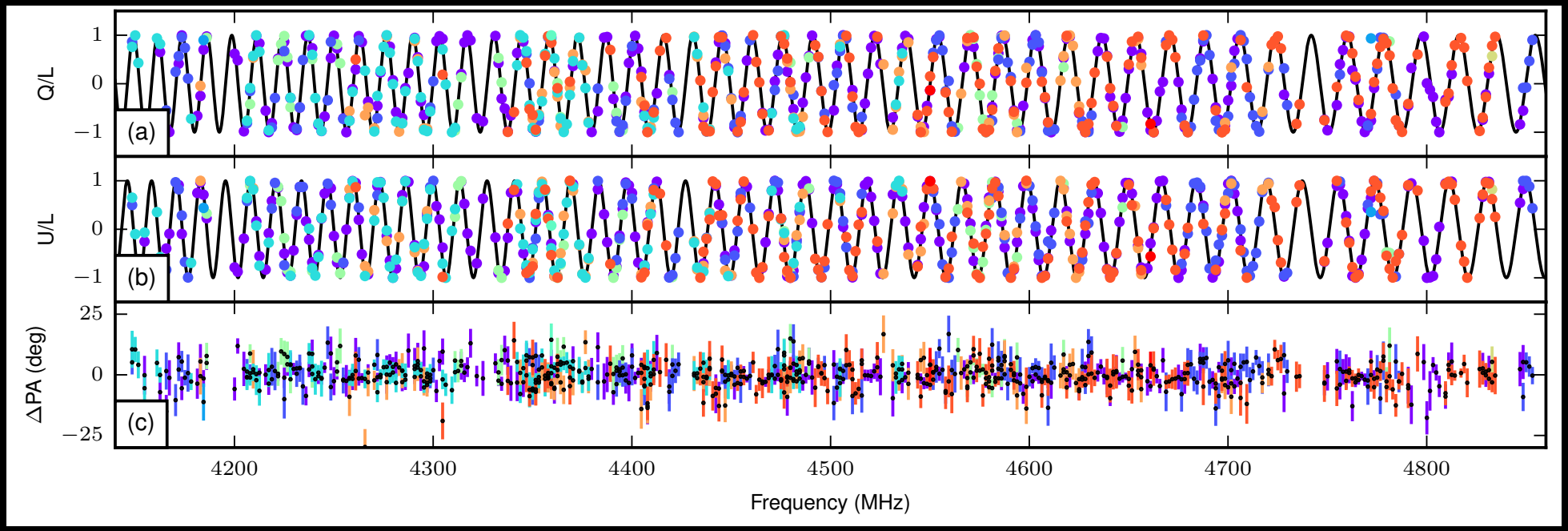

Michilli, Seymour, Hessels et al. 2018

Variable rotation measure ~ 140,000 rad m^{-2} in the source reference frame:

- Extreme and dynamic magneto-ionic environment.
- Associated with a massive black hole or a dense nebula?

Recent science highlights

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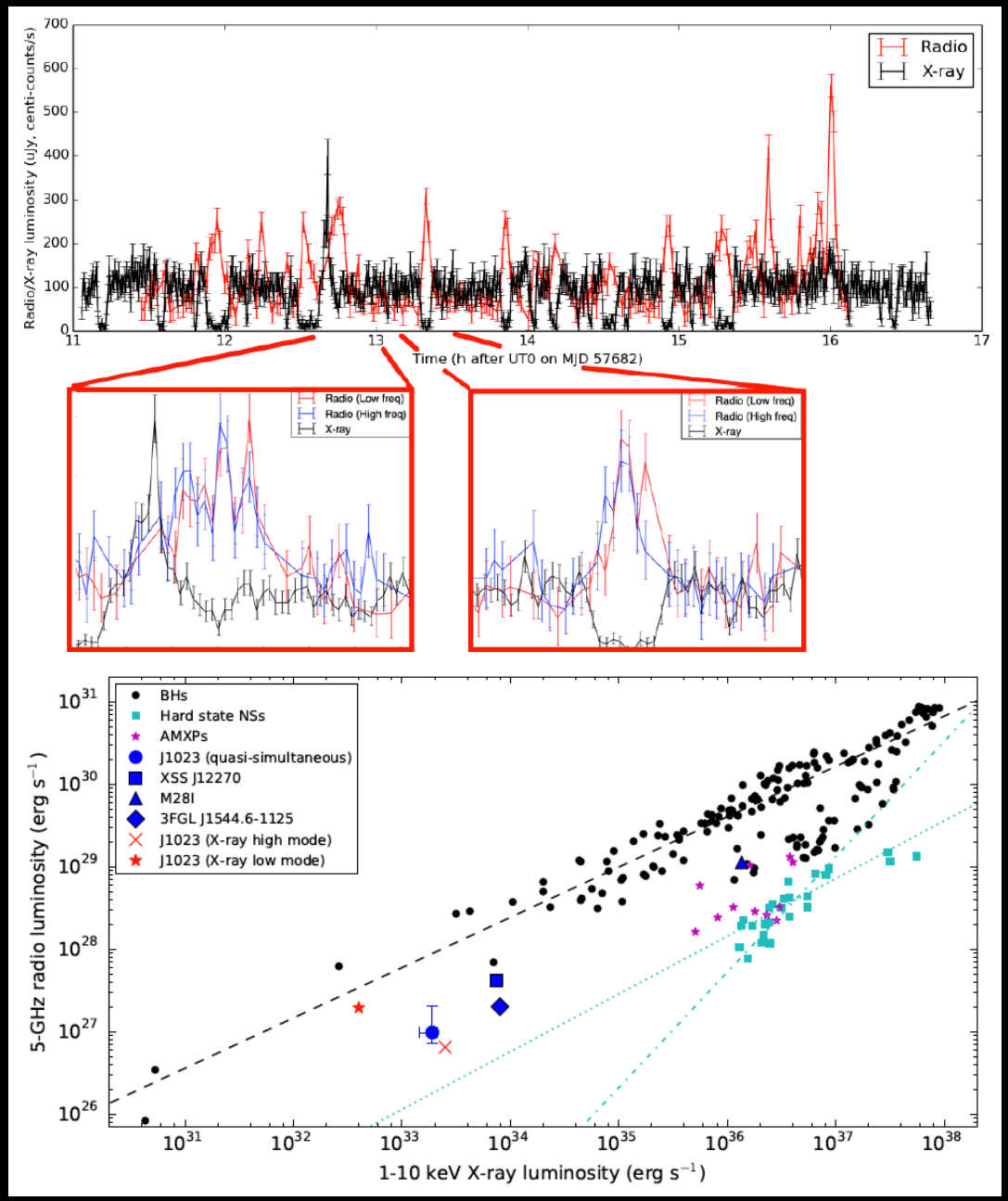


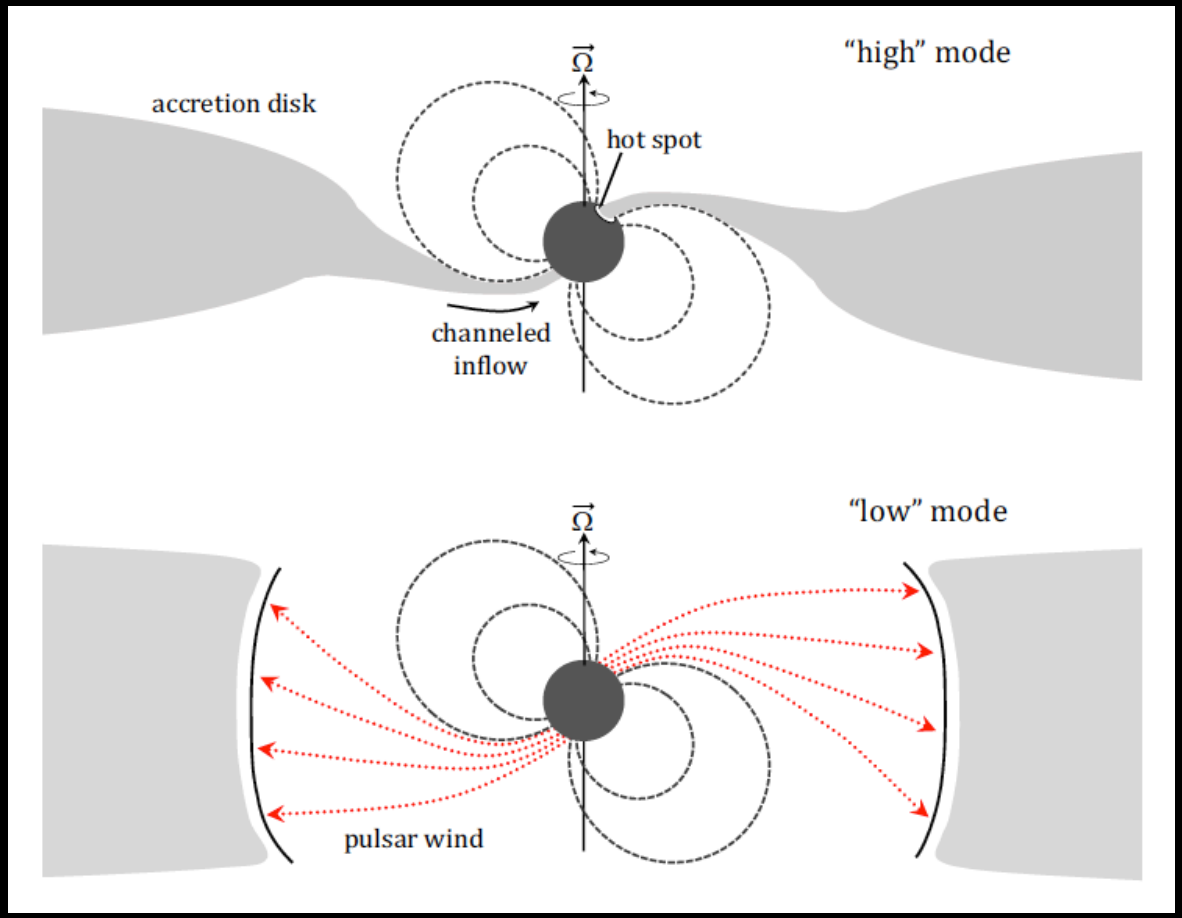
Transitional millisecond pulsar / LMXB J1023+0038:

- Anti-correlated X-ray moding and radio flaring.
- Mimics black holes on the radio - X-ray correlation plane.

Bogdanov et al. 2018

Recent science highlights

(bias to NL work)



Transitional millisecond pulsar / LMXB J1023+0038:

- Collimated outflow switching on/off?
- Temporary inflation of a pulsar wind nebula?

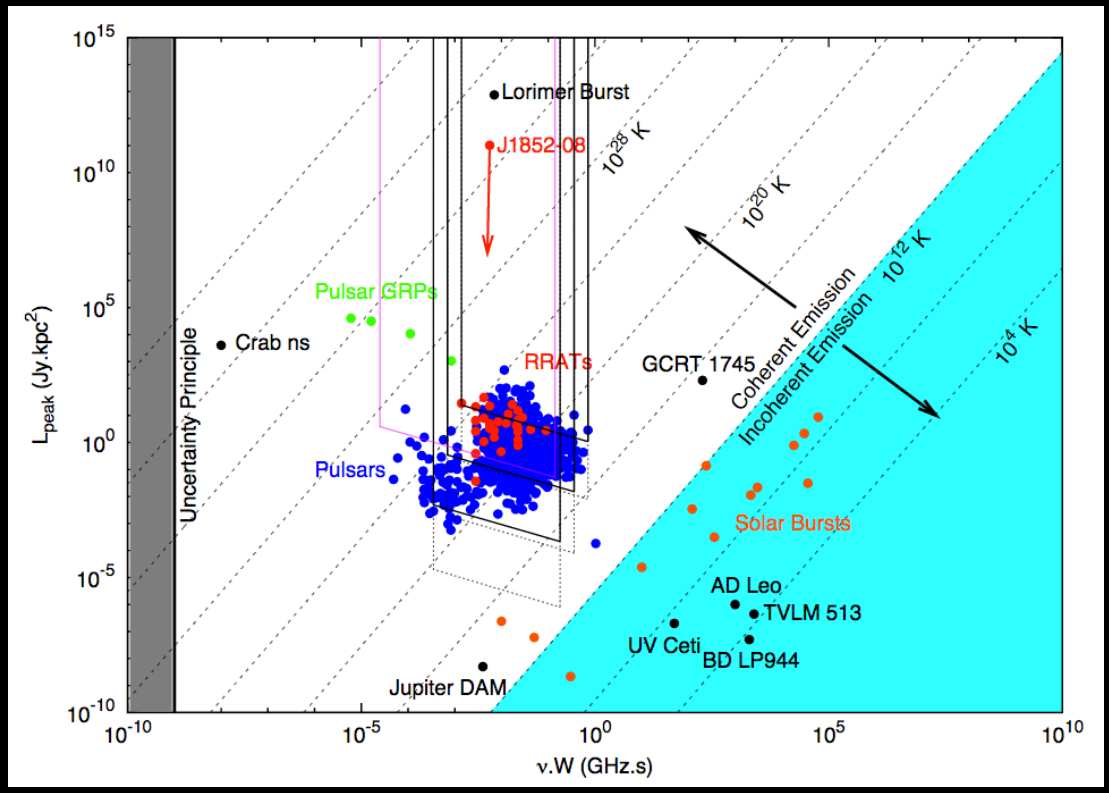
Archibald et al. 2015
Deller et al. 2015
Jaodand et al. 2016
Bogdanov et al. 2018

Work with pathfinders & precursors

(bias to NL work)

- LOFAR: LOTAAS pulsar/fast transient survey (Hessels), image plane GW follow-up (Rowlinson), TBB triggering (van Leeuwen)
- APERTIF: ARTS pulsar/fast transient survey (van Leeuwen), ARGO image-plane transients (van Leeuwen)
- MeerKAT: TRAPUM/MeerTRAP beam-formed fast transients (Stappers), Thunderkats image-plane transients (Fender)
- Single dishes: Arecibo/GBT/Effelsberg FRB searches (wide-field and targeted)

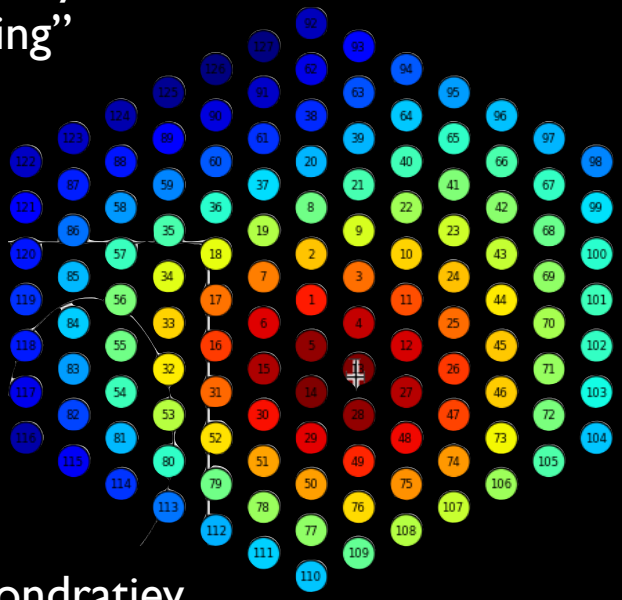
Evolution to a KSP



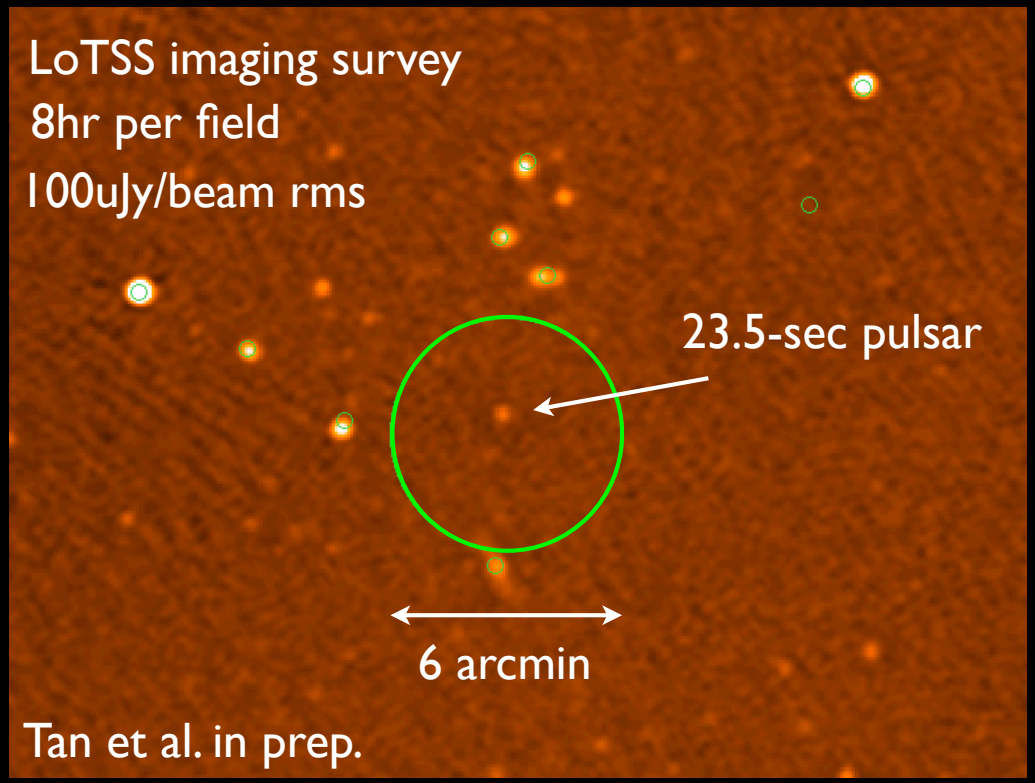
- KSP more based on techniques and shared infrastructure than a single science goal… or goal: “explore the transient sky”.
- Intermediate array release is scientifically insufficient (with some exceptions), but it’s important to make sure commensality is built in and could monitor bright sources as a proof of concept.

Evolution to a KSP

Tied-array
"imaging"

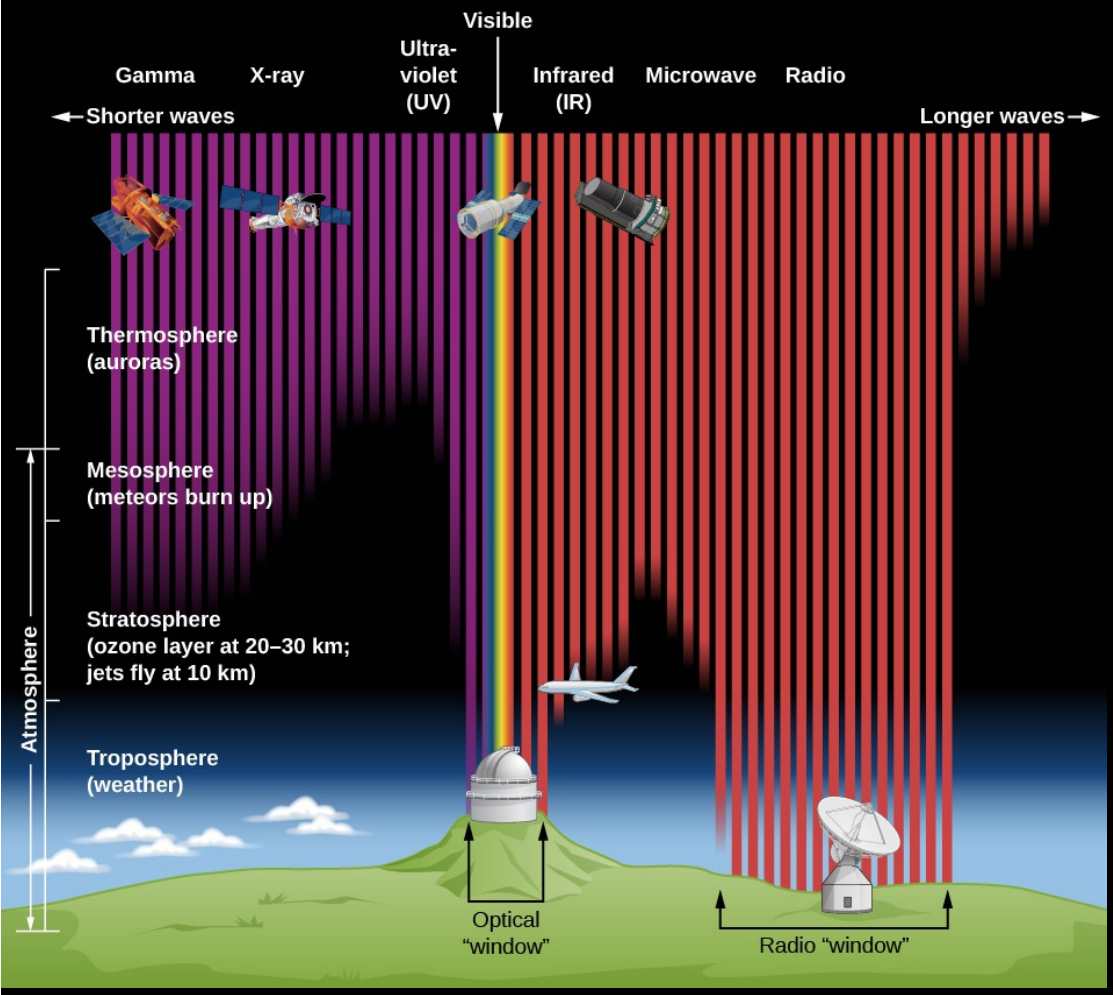


Kondratiev



- Feeling in the group is that the best thing right now is to exploit the current pathfinders/ precursors in order to determine interesting directions for SKA.
- KSP built out of existing collaborations with MeerKAT, ASKAP, LOFAR?
- Beam-formed transients and image-plane transients under the same umbrella?

Issues/Concerns/Roadblocks



- Response time and latency of access to data.
- Flexibility of scheduling for transients and multi-wavelength coordination.
- Commensal observing opportunities (are transients needs strongly limited when "heavy" projects are running?).
- Data rights (find a transient in "someone else's" data).