# Astronomy and Space Science (ATNF)

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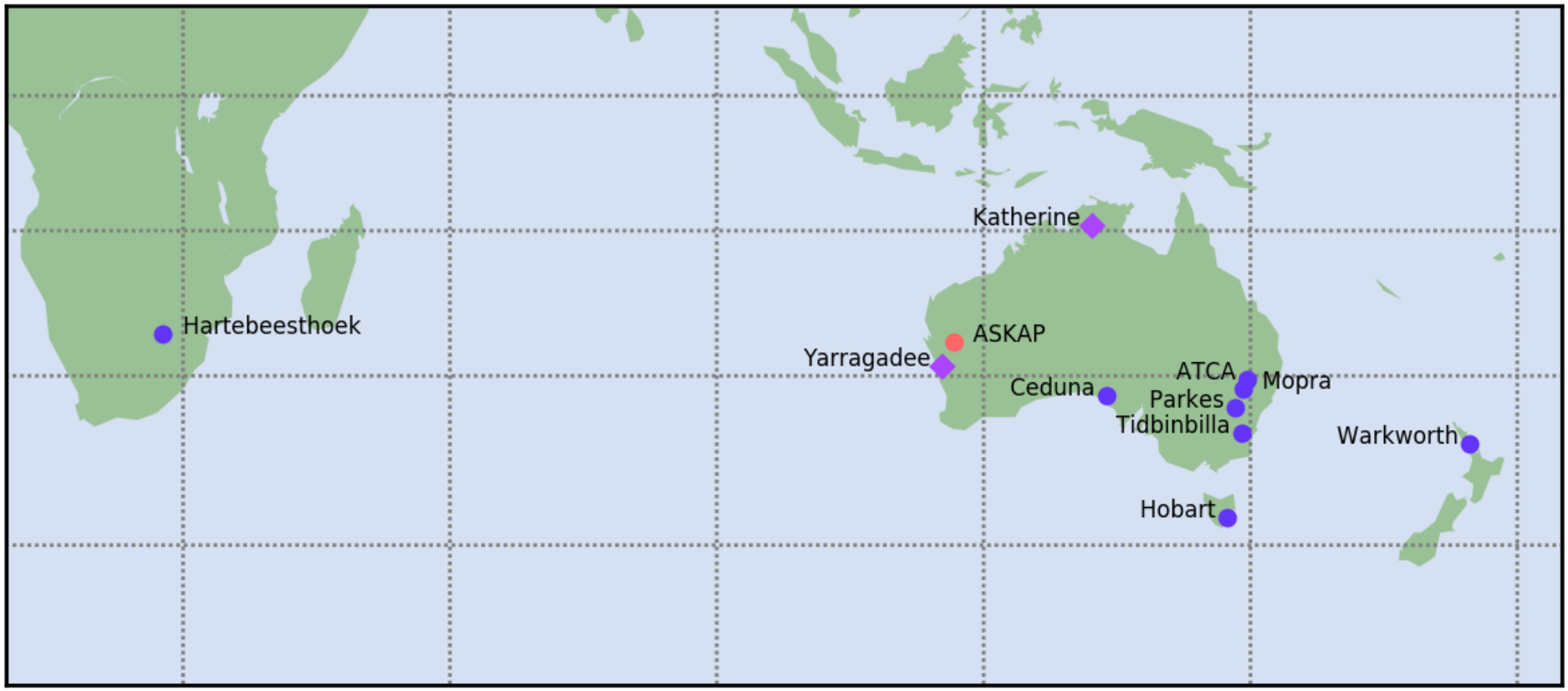
# CSIRO Astronomy and Space Science

- CASS operates Parkes, ATCA and (eventually) ASKAP as National Facilities.
- CASS operates Mopra on a 100% cost recover model
- CASS operates CDSCC on behalf of NASA
  - ATNF and CDSCC essentially operate independently
- Parkes and ATCA operate with dual “pay for view” and open sky policy
  - Open sky time judged on scientific merit
- CASS coordinates LBA in close cooperation with the University of Tasmania, Hartebeesthoek Radio Observatory and Auckland University of Technology
  - LBA proposals judges on scientific merit


Katherine
Hartebeesthoek
ASKAP
Yarragadee
ATCA
Mopra
Ceduna
Parkes
Tidbinbilla
Warkworth
Hobart

# ASKAP

- 36 x 12m
- 36 beam PAF
- 640-1920 MHz
- 300 MHz instantaneous bandwidth
- No VLBI backend current
- Tied array proposed, not funded
- Many all sky surveys

# Mopra

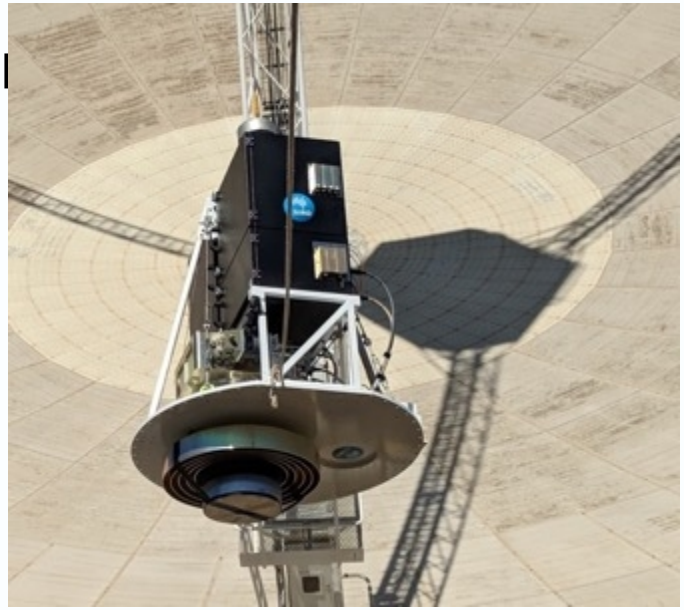
- 22m Cassegrain
- 1.3-3.0 GHz, 4.5-6.8 GHz, 8.0-9.2 GHz, 16-26 GHz, 30-45 GHz, 85-115 GHz
  - C/X possible simultaneously (but not S/X)
- LBA DAS backend
  - Equivalent to 4 BBC
  - 8x16 MHz or 4x64 MHz
  - Always dual pol – only tw unique frequencies
- All access “pay for viev

# ATCA

- 6x22m Cassegrain
- Tied array (typically 5 ant
  - 5 antenna reconfigurable from 75m to 3km
- 1.1-3.1 GHz, 4-12 GHz, 15-25 GHz, 29-51 GHz, 85-105 GHz
- 8 GHz IF band (15 GHz and above)
- 2 x 2 GHz tuneable band within 8 GHz
- LBA DAS system
  - Equivalent to 4 BBC
  - 8x16 MHz or 4x64 MHz
  - Always dual pol – only two unique frequencies

# Parkes

- 64m Cassegrain
- Wide receiver range from 700 MHz-26 GHz
  - S/X receiver
  - 700-4000 MHz UWB-L (full ba
    22 K Tsys)
  - 16-26 GHz
- 2 x 1 GHz IFs
- LBA DAS system
- Mark5B+
- UWB GPU backend
  - Q1 2019, very flexible backend



# Mopra

- Upgrade C/X receiver to CX
  - 4-12 GHz continuous coverage
  - Need up upgrade down conversion also
- New VLBI backend
  - DBBC, or duplicate of Parkes UWB system

*All would need 100% external funding, and budget to contribute towards antenna running cost*

# ATCA

- Plans to replace existing CABB correlator with GPU based system
  - Replace LBA DAS system
- Stage 1 allow VLBI in 2x2 GHz IFs
- Stage 2 allow VLBI up to 8 GHz bandwidth
  - Most likely selection of channels within 8 GHz
- Sub-array in frequency possible (e.g. 1 antenna at 2 GHz, rest at 4-12 GHz)

*CASS actively seeking funding – collaborators always welcome with modest ”cash” contribution*

# Parkes

- Current S/X is aging…
- Plans for “UWB-High” receiver
- 4-26 GHz
  - Probably 4-14, 14-26 GHz
- 12  GHz sampled bandwidth
  - Not full bandwidth processed
- Likely to mean S/X receiver is decommissioned
- 12m patriot dish?

  *Not funded yet, and likely lower priority that “Cryo PAF” and ATCA digital backend upgrade. Not likely to proceed until strong community request.*

# CSIRO IVS support

- CASS contributes fairly minimally towards IVS
  - ATCA and Mopra “wrong” setup
  - Parkes over-subscribed, and not ideal instrument for routine geodesy
  - Time allocation based on purely science

*With modest upgrades to receivers and backends, Parkes, ATCA and Mopra could contribute in the future to IVS operations on the 4-12 GHz range*

# Thank you

**CASS/ATNF**
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