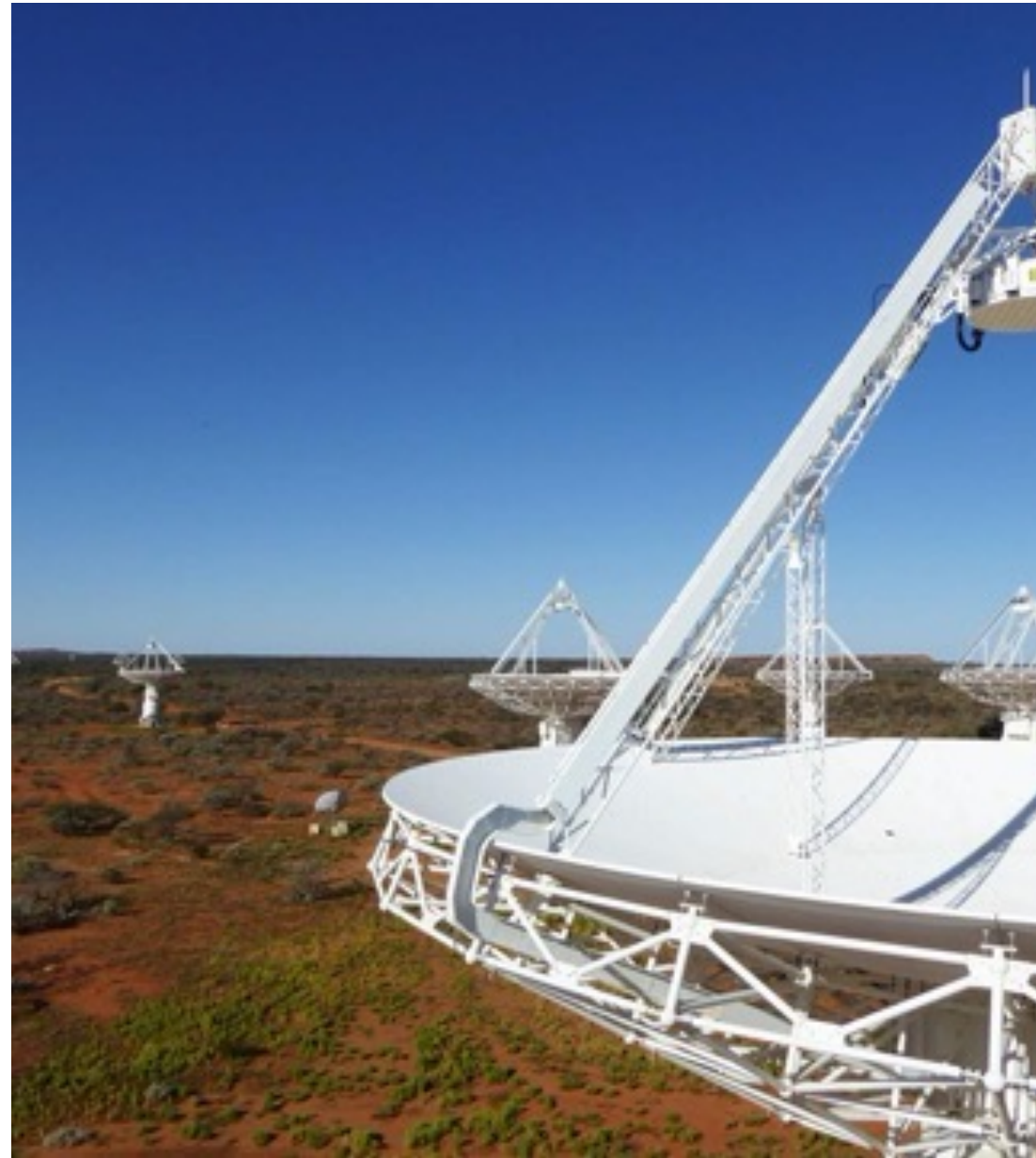




# The CSIRO ASKAP Science Data Archive

Minh Huynh (CSIRO), for the CASDA team

Australia's National Science Agency





# Aus SKA Pathfinder

- CSIRO's newest radio telescope, SKA precursor
- Located in radio-quiet zone of WA
- Operational since Feb 2019
  - Full surveys from late 2022
- Designed for survey speed
  - Wide field of view
  - High data rates
  - Requires integrated supercomputer





# CSIRO ASKAP Science Data Archive

- CASDA archives science-ready data products from ASKAPsoft /observatory team
- Data formats:
  - Images & Image cubes (FITS, up to few TB cubes)
  - Spectra (FITS)
  - Catalogues (VOTable)
  - Visibilities (CASA Measurement Sets)
- Publish user derived valued-added data from science teams
- Archive ~5 PB per year, current volume ~5.73 PB.
- <https://casda.csiro.au>





# CASDA Aims



## Data Discovery

Find data useful to you  
Minimal radio astronomy  
knowledge assumed  
Query data products  
Query source catalogues



## Data Access

Download entire data  
products  
Extract small parts of very  
large cubes (up to 3.5 TB)



## Data Publication

Science team 'value-added'  
data  
Legacy surveys  
DOIs assigned



# ASKAP Data on DAP

- ASKAP data is served through CSIRO's Data Access Portal
- These web tools also interact with the VO services
  - Downloads
  - Cutouts
  - Spectra generation
  - Catalogue queries

data.csiro.au

CSIRO Data Access Portal - ASI X

https://data.csiro.au/domain/casda

80%

Most Visited Getting Started Getting Started Casda Service Statu... CSIRO Data Deposit... carta https://monview-mr... Single Host (influx2... http://casda-prd-ap... CASDA Monitoring -... Other Bookmarks

CSIRO Data Access Portal

SEARCH CATEGORIES SCIENTIFIC DOMAINS CONTACT US HELP

CSIRO.AU My Collections Tasks 2219 Huynh, Minh

CSIRO's Astronomy science data archives from Parkes, ATCA, ASKAP and LBA telescopes.

Scientific domains / ATNF

Australia Telescope National Facility (ATNF)

These search options and services are making data from ASKAP, ATCA, LBA and Parkes telescopes available to the astronomical community.

CASDA  
**ASKAP Observations**  
Query the CSIRO ASKAP Science Data Archive (CASDA) for observations taken by the ASKAP radio telescope.

PPDA  
**Pulsar Observations**  
Query the Parkes Pulsar Data Archive (PPDA) for pulsar observations taken at the Parkes radio telescope.

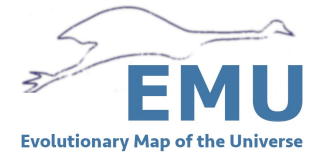
CASDA  
**Cutout Service**  
Generate cutout from surveys in the CSIRO ASKAP Science Data Archive (CASDA).

CASDA  
**Skymap**  
Query the CSIRO ASKAP Science Data Archive (CASDA) using an interactive sky map.



# ASKAP Survey Science Teams

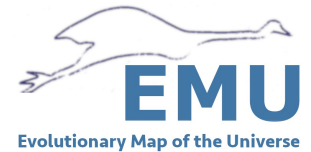
- All-sky (2Pi sr) continuum and HI surveys (EMU and WALLABY)
- Study of cosmic magnetism with all-sky polarization survey (POSSUM)
- Deep HI (emission) survey to study gas in distant galaxies (DINGO)
- Blind survey of HI absorption in distant radio galaxies (FLASH)
- Survey of gas (HI and OH) in Milky Way and Magellanic Clouds (GASKAP)
- Search for variable and transient radio sources (VAST)





# ASKAP Survey Science Teams

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Data is public after a validation period



# CASDA Dataset Highlights

- Rapid ASKAP Continuum Survey (RACS)
  - First all-sky continuum survey with ASKAP at 888 MHz
  - All 903 fields primary data deposited and released (McConnell et al. 2020)
  - First all-sky combined catalogue recently published and also released, >2M radio sources (Hale et al. 2021)
    - Includes images/tiles mosaiced with overlapping regions
  - “RACS-low”, 250 microJy rms, Dec < +41°
  - <https://research.csiro.au/racs/>







# CASDA Dataset Highlights

- More RACS!
  - RACS-mid, RACS-high, multiple passes at low
  - RACS-mid (1.4 GHz) now released (Duchesne et al.)
  - 175 microJy rms, Dec < +49°
  - ~1500 pointings!
- RACS-high (1650 MHz, ~200 microJy rms)
- RACS-low2 and RACS-low3 ...
- <https://research.csiro.au/racs/>





# Growing Usage

- Volume = ~5.7 PB, expected to grow at ~5 PB per year
- Current usage:
  - About 1000 unique users in last year
  - 100s web sessions, and 10,000s VO queries, per month (100,000s per month inc. HIPS)
  - 10,000s downloads per month





# CASDA Summary

- Full ASKAP surveys are underway
  - Large all sky surveys
    - Continuum, polarization and HI
  - Search for transients and variables
- CASDA provides science-ready data to community
  - ASKAP survey data is non-proprietary after a (short) validation period
- **See tomorrow's talk at CSP plenary for more info**





# Resources

- CASDA webpage <https://casda.csiro.au>
- ATNF ASKAP webpage  
<https://www.atnf.csiro.au/projects/askap/index.html>
- ASKAP newsletter  
[https://www.atnf.csiro.au/projects/askap/commissioning\\_update.html](https://www.atnf.csiro.au/projects/askap/commissioning_update.html)
- ASKAP User information  
<https://research.csiro.au/askap-guide/>



To be continued ...

More in tomorrow's CSP plenary

Thank you

**Space and Astronomy**

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Australia's National Science Agency