



*We acknowledge the Wajarri Yamatji people as
the traditional owners of the Observatory site*

ASKAPsoft update

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23 October 2018 – AAL-NCA ASTRONOMY DATA AND COMPUTING WORKSHOP

CSIRO ASTRONOMY AND SPACE SCIENCE

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ASKAP Project Update – Commissioning

Hardware completion on track – end 2018

Array Release (AR) 3 near completion

- 28 antennas, 288 MHz, 36 beams, 10 sec integration ~ 3 TB/h of raw visibilities
- Fringe rotation/phase tracking per beam and zoom modes testing on-going
- Processing of the Pilot cosmology survey and early science data backlog

Next 3 - 5 months - AR4 and Pilot Surveys

- CRAFT (Fast Radio Burst)
- ASKAP-36 Pilot Surveys commencing in Q1 2019

SN1006 (288MHz@888MHz, ASKAP-28 Sep2018)

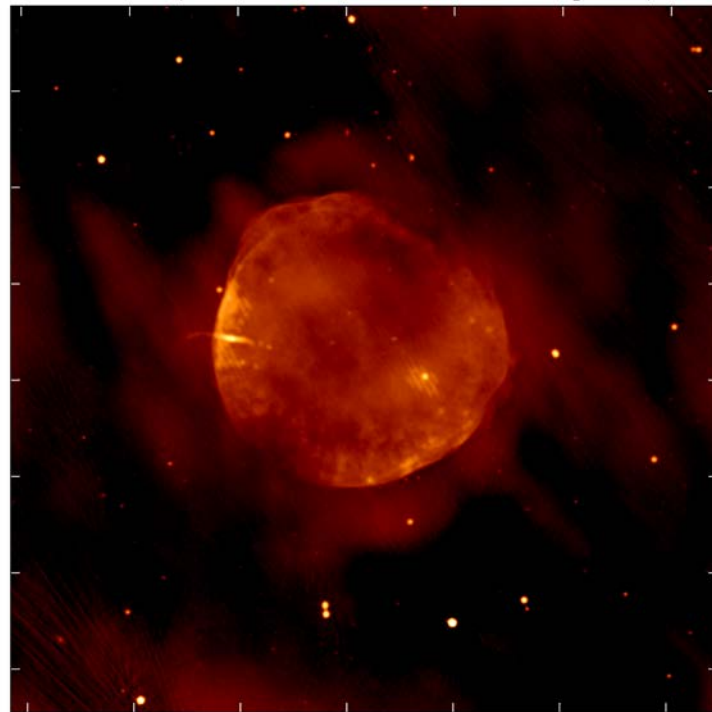


Image Credit: Wasim Raja

ASKAP Computing Hardware

In Operations since Feb 2014

Ingest cluster

- 16 nodes, 16 cores/node, 64 GB/node RAM

Central Processor (Galaxy) – 200 Tflops peak

- 472 x Cray XC30 Compute Nodes
- 64 Gb/node of RAM, 20 cores/node

Buffer (fast) storage – Lustre FS

- 1 PB dedicated to ASKAP
- ~1 PB for ASKAP Early Science (shared)
- Peak I/O performance: 30 GB/s



ASKAPsoft – Calibration/Imaging Software

In development since 2007

- Bespoke calibration and imaging synthesis code, built to run in HPC platforms = parallel (C++/MPI)
- Wide-field of view interferometric imaging
- Designed for automatic/real-time pipeline operations

ASKAPsoft v.0.22 – Early Science + Pilot Survey

- Streaming (real-time) processing: Ingest -> Raw Visibilities
- Batch processing – continuum & spectral line imaging
- Linear mosaicking (per beam) – testing joint deconvolution
- Performance issues for spectral line imaging
- Limited commensality

Available under GPLv3 in CSIRO's Bitbucket

<https://bitbucket.csiro.au/projects/CASSOFT/repos/askapsoft/browse?at=refs%2Fheads%2Freleases%2FCP-0.22>



ASKAP Science Processing

ASKAP-SW-0020

Version: 2.0
Date: 28/12/2011
Project: ASKAP

Prepared by: Tim Conway, Ben Humphreys, Emil Linc, Maxim Voronov, Matthew Whiting


Reviewed by: Ross Fain
Review release: Release issue: 3260
Approved by: Ross Fain

Date: 28/12/2011

Keywords: compiling, science, processing



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The image features a 2x3 grid of six dark gray, rounded square tiles. Each tile is slightly rotated and has a fine, grainy texture. The tiles are set against a solid black background. In the center of the grid, there is a line of white text.

Images made by Susannah Keel, Robin Wark
and Stacy Mader

ASKAPSoft Challenges and Future

Limited resources to support ASKAPsoft in other HPC

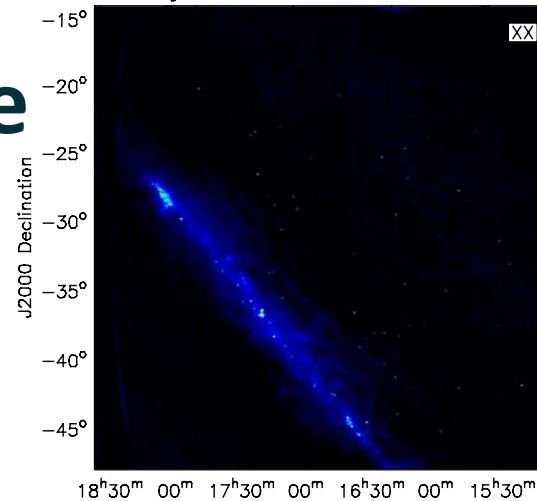
Software and hardware limitations

Computing Infrastructure Upgrade

- Part of the \$70M Pawsey capital refresh
- Increase buffer space (scratch) - **FY18/19**
- Procurement of Galaxy replacement - **FY 19/20**
- Input from ASKAP Science Teams - **Q1 2019**
- Tender documentation - **mid-2019 (TBC)**

Exploring new technologies, uses and alignment with SKA

- GPU, multi-threading deconvolution, streaming architectures
- ASKAPsoft for other instruments (MWA)



Thank you