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

ASKAPsoft update

J.C. Guzman  |  ASKAP Computing Leader
23 October 2018 – AAL-NCA ASTRONOMY DATA AND COMPUTING WORKSHOP
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

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

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