



ASKAP pilot surveys

An update on current activity and future plans

Aidan Hotan | ASKAP lead scientist
26 June 2018

CSIRO ASTRONOMY AND SPACE SCIENCE
www.csiro.au

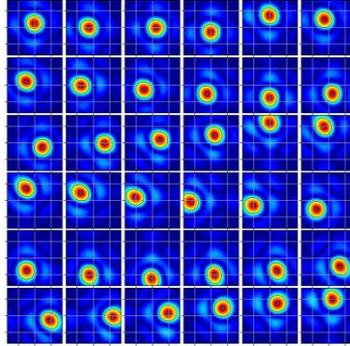
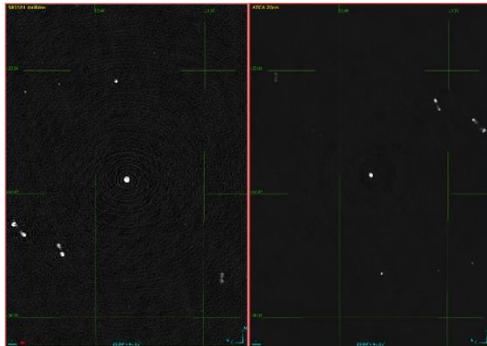
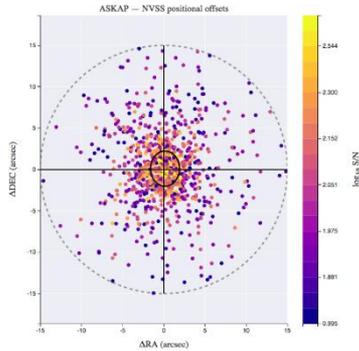


ASKAP science goal summary

- *Understanding galaxies, their environments and their evolution through large scale radio continuum and spectral line surveys*
 - **EMU**: Continuum survey, millions of new starburst and AGN detections
 - **WALLABY**: Neutral Hydrogen survey, studying local group dynamics
- Polarisation and cosmic magnetism, HI absorption, stacking, galactic HI, transients and variable sources
- Explore the unknown by opening new parameter space
- Pioneer the emerging field of fast transient detection and localisation

Commissioning update

- 6 correlator blocks now integrated, giving 288 MHz bandwidth
- Enhanced fringe tracking system now operational
 - Support for all frequency bands and single zoom modes (soon)
- Integration of additional antennas to commence soon
 - Installation of final electronics complete by November



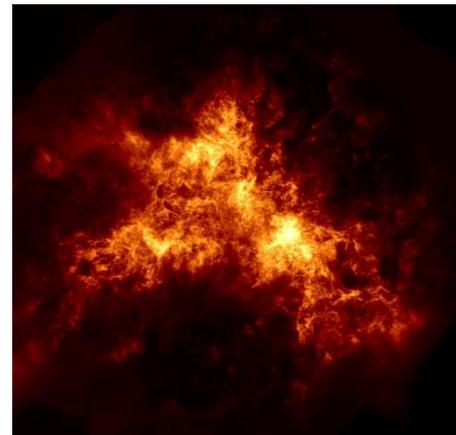
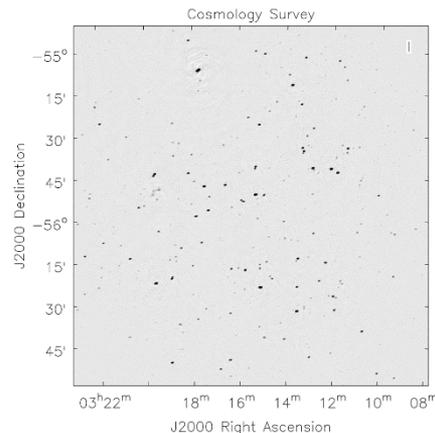
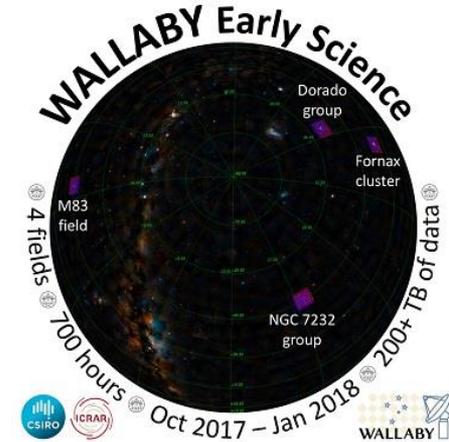
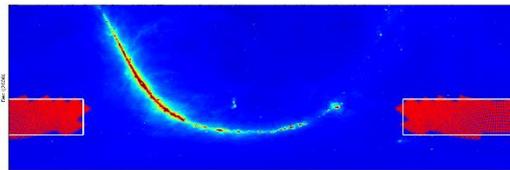
Timeline for ASKAP survey science

- Array Release 2 (12 antennas): October 2017
 - Beginning of early science observations
- Array Release 3 (18 antennas): August 2018
 - Integration of major control system upgrades
- Array Release 4 (36 antennas): February 2019
 - Start of pilot surveys with all antennas

- Review of science goals and scheduling of full surveys
 - Experience from pilot surveys will feed into full-scale observations
 - Strategies may change, or pilot surveys might blend into full scope

Highlights from AR2 early science

- WALLABY early science - Imaging of a nearby spiral galaxy
 - Dane KLEINER
- Gemini Follow-up of Two Massive HI Clouds Discovered with ASKAP
 - Juan MADRID
- WALLABY Early Science observations of the NGC 7232/3 triplet
 - Karen LEE-WADDELL
- ASKAP/WALLABY Early Science Observations of the NGC 7162 Group
 - Tristan REYNOLDS
- ASKAP Wide and Deep HI surveys
 - Jonghwan RHEE
- Deep Low Frequency Observations of the GAMA 23 Field
 - Nick SEYMOUR
- Evolutionary Map of the Universe Early Science Results
 - Andrew O'BRIEN
- Early science results from the ASKAP-FLASH survey
 - Elizabeth MAHONY
- Fast and slow transients
 - Legion – this afternoon!



Early science and pilot survey time allocation

- Community involvement is critical to success
- AR3 science time will be available on a shared-risk basis in 2018
 - Observations scheduled adaptively around commissioning
 - Equal opportunity for all teams, to inform pilot survey proposals
- AR4 pilot surveys will commence early in 2019
 - 200 hours per team, 400 each for EMU and WALLABY
 - Creative options for commensal observing welcomed, *not* required

Pilot survey timeline

- Proposed timetable put to AT Steering Committee in May:
 - ~~Jun 2018: Early Science WG meeting to discuss Early Science with ASKAP-18~~
 - Jul/Aug 2018: Early Science observing with ASKAP-18 commences
 - Oct 2018: Community workshop to plan for pilot surveys (Ekers WG)
 - Nov 2018: Plans for pilot surveys published by CSIRO
 - Feb 2019: ASKAP pilot surveys commence
 - Observations conducted by ATNF operations team
 - Processing parameters specified adaptively by science teams
 - Batch processing conducted by ATNF operations team
 - Final products archived to CASDA upon completion of each block

Batch processing of pilot surveys

- The original ASKAP plan called for automated, real-time processing
 - Projected to be the only way to achieve 100% duty cycle
 - Relies upon real-time calibration using a sky model service
 - Assumes that processing parameters are known in advance
 - Makes retrospective calibration and multi-night combination difficult
- Experience with early science required a shift in priority
 - “Temporary” batch processing pipeline has arisen from necessity
 - Processing parameters are difficult to pin down (requires experience)
 - Re-processing is essential to achieve science-quality images

CSIRO ASKAP Science Data Archive

- ASKAP will produce roughly 5 PB of *images* per year
- These, and associated catalogues, will be stored online
- CASDA will:
 - Store quality-controlled data from each scheduling block
 - Provide storage for value-added catalogues and products
 - Have a Virtual Observatory interface to facilitate access
- NGC7232 continuum AR2 data and HIPASS now available
- <https://data.csiro.au>

Thank you