



ATUC ASKAP Update

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CSIRO ASTRONOMY AND SPACE SCIENCE
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ASKAP hardware installation progress

- All 36 antennas have PAFs installed (most with ODCs as well)
- 24 antennas have complete, working digital backend systems
 - Remaining hardware installation is scheduled for completion in November
 - Parts procurement holdup – no solved
- 5 correlator blocks installed (48 MHz each, total 240 MHz)
 - Cards required to complete the next block are in transit to the MRO
- Server upgrades over the next few months will provide all the required compute capacity to control and monitor 36 antennas

ASKAP commissioning report

- Acceptance tests of all 36 PAFs complete
 - Working on system configuration refinement for smooth operations
 - Checking array-wide characteristics of mapping tables, attenuators, etc.
- Beam weights database service deployed and operational
 - More efficient computation, automated file handling and tracking
 - Framework to allow weight updates via ODC, multiple formation algorithms
 - Polarimetric calibration (X-Y phase) via ODC will also be implemented
- Commissioning of centralised fringe tracking nearing completion
 - Verified on all non-zoom bands, with similar accuracy to ingest-based method
 - Zoom mode support requires a little more code development

Milestone: Array Release 3

- Scheduled for completion August / September 2018
- 18 antenna array configurable from a pool of roughly 24
- Phase tracking using centralised CALC-based control system
 - Capable of independent phase centres per beam (in development)
 - Updates synchronously with correlator cycles, so no flagging required
- Access to 1400-1800 MHz band and simple zoom modes
- 288 MHz of instantaneous bandwidth
- Optional access to longest baselines to test full-resolution imaging

Milestone: Array Release 4

- AR3 deploys many key new features
 - 288 MHz correlator bandwidth, control system updates, etc.
- AR4 should mostly involve integrating more antennas
 - Note that this is not a risk-free process!
- Scheduled to have all 36 antennas available Feb 2019
 - There will still be maintenance requirements, isolated issues, etc.
- The goal of AR4 is to offer *data capture* from the full array
 - Processing pipelines will still be under development
 - Observing strategies need to be formulated, tested and refined
 - Data processing will not be automated or done in real time (for most modes)
 - Intending to keep some raw visibility data during pilot surveys

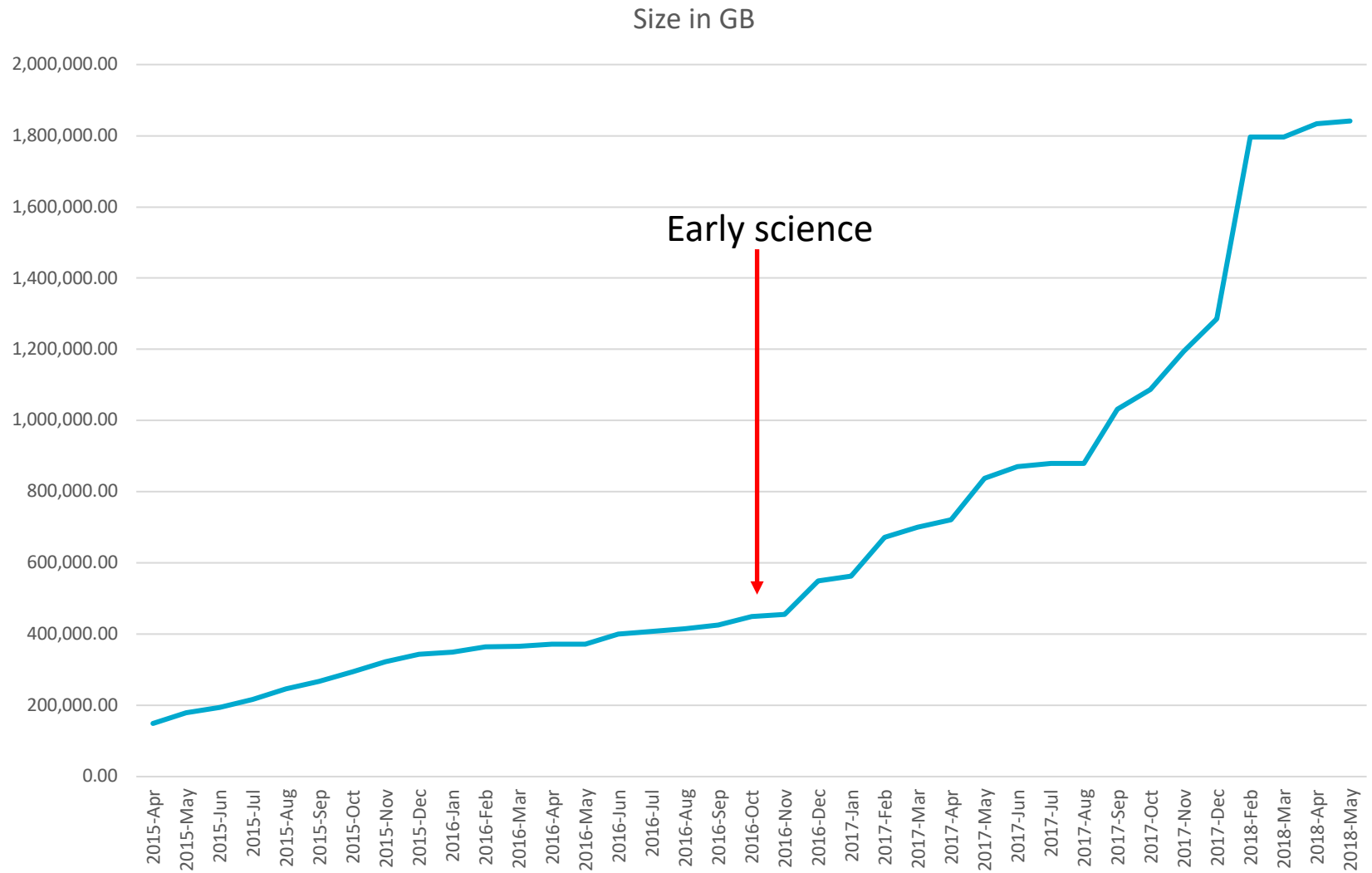
Continuing ASKAP early science

- Nearing completion of the initial early science program scope
 - Four WALLABY fields, several test regions, most science teams represented
- Expecting to finish the Cosmology survey observations before AR3
 - This will form part of our verification process for the new fringe tracker
- Current processing limited by disk space and CPU time on Galaxy
- Science teams playing a key role in testing SDP pipeline
- Early science post-AR3 will evolve into pilot surveys
 - The process of time and resource allocation will be discussed by Phil & JR
 - Science teams encouraged to discuss options and ideas (PI meetings)

Science data pipeline development

- Much development has gone in to creating a pipeline that can process ASKAP early science data (thanks to everyone involved!)
 - This has been a joint effort between the SDP group, SSTs and ACES
 - Experience with real data is required to validate the software
 - Alignment between development and testing is important
- With \$70 million allocated for Pawsey upgrade, the ASKAP computing platform will change significantly in ~12 months
 - Priorities in the short term will be shifted to better support early science processing, commissioning activities and pilot surveys
 - Optimisation and further automation should wait for the final platform
- More disk space is being requested on an advanced timescale

Commissioning archive usage



Science data processing sprint process

- SDP development priorities defined on a month-long cycle
- ASKAP lead scientist acts as the ASKAPsoft “product owner” and defines priorities for each sprint based on multiple inputs
 - These include technical feasibility, science team feedback, recent experience, capability requirements and aspirational goals
- Development and improvement of existing pipeline components will feature heavily in the next few sprints
 - Advanced features like real-time calibration will become a higher priority once we have supporting data (e.g. sky model) to test with
- Feedback and requests to the product owner should occur via the early science forum and ACES meetings

Operational support for data processing

- Instead of automated imaging, the plan is to provide operator assisted pipeline processing to improve efficiency
- The ASKAP operations team will see to the complete life-cycle of pilot survey scheduling blocks
- Science teams will iteratively process small subsets of their data to establish the best pipeline parameters for each project
- The bulk of the processing will then be run by the operations team, with careful management of dedicated disk space
- Outputs will be routinely uploaded to CASDA, which is intended to be the main point of access for science teams
- SST communication with the operations team will be critical

CSIRO ASKAP Science Data Archive

- The first early science data was released to CASDA in July 2017
 - 48 MHz bandwidth NGC7232 fields, continuum only
- Unfortunately, nothing has been added since then
 - Combination of image quality issues and processing backlog
- CASDA supports staged upload of additional data products
- Current plan is to add spectral line data to the NGC7232 entries very soon to test 36-beam spectral line processing and validation
- The CASDA team will also work with astronomers to support upload of level 7 products from early science publications

ASKAP survey plan review delayed

- It has been several years since the SSPs were originally reviewed and circumstances have changed significantly
 - Changes encompass both scientific progress and system parameters
- We need a review process that delivers rankings or grades that can be used to allocate and schedule instrument time
- At a recent SST PI meeting it was recommended that we delay this review until more experience with AR3/AR4 has been gathered
 - This will allow estimates of array performance to be refined and desirable strategies like commensal observing to be tested
 - Allocation of time needs to accurately reflect technical feasibility
 - See Phil & JR's presentations for more information

ASKAP community engagement

- Early science forum, third Tuesday of every month
 - <https://confluence.csiro.au/display/askapsst/Early+Science+Forum>
- Commissioning update newsletters
 - https://www.atnf.csiro.au/projects/askap/commissioning_update.html
- Commissioning schedule
 - <https://confluence.csiro.au/display/askapsst/Schedule>
- We welcome ATUC's feedback!

*We acknowledge the Wajarri Yamatji people
as the traditional owners of the Murchison
Radio-astronomy Observatory site*

Thank you

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