



Early Science with ASKAP

CASS has stated its commitment to delivering ASKAP as fully scoped and is currently seeking additional funding to realise this goal. However, CASS also recognises the benefits of facilitating world-class early science while the construction, integration and testing of additional ASKAP Mk II receiver systems continues in parallel. This approach will not only provide early science data and training for future ASKAP users, but also enable a robust test of the science capabilities of the facility.

CASS therefore intends to support an early science program with an ASKAP platform, comprising at least 12 antennas with ADE systems and a hardware correlator with up to 300 MHz instantaneous bandwidth and 16,000 spectral channels.

Below we outline a proposed way forward. We invite feedback from the ASKAP survey teams and other members of the astronomy community.

Program development

CASS strongly supports a unified approach to the ASKAP early science program, resulting in data of broad scientific value. Given the limited observing time available on this facility, CASS suggests that a program of commensal continuum and spectral line observing is carried out. Rather than soliciting new proposals, CASS plans to develop a science program through a consultative process with SSTs. In specifying the evolving antenna configuration, frequency range and survey strategy, strongest consideration will be given to the science goals of the 'A' ranked science survey programs, EMU and WALLABY. However, input from the other SSTs will also be considered.

During May 2013, CASS will begin to develop a unified early scientific program in consultation with EMU, WALLABY and other survey science teams. In parallel, CASS will use the input it has received from the SSTs to formulate a proposed build order (configuration) of the antennas for the early science platform, taking into account relevant technical considerations and other project constraints, such as requirements relating to construction and commissioning activities.

This timing is determined by the fit-out schedule for the ASKAP antennas, which takes approximately one month per antenna. Since the antennas are already in place, and the first of the Mark-II PAFs are expected to be ready for deployment by the end of 2013, the fit-out sequence of early science antennas will need to be determined by mid-2013.

Timing and constraints

ASKAP early science will play an important role in the verification of the facility. However, the main priority during the construction and commissioning phase will remain completion of ASKAP construction and the delivery of the full ASKAP capability. Where the early science program is in direct conflict with the completion of ASKAP it should be assumed that the latter will take precedence.

The ASKAP early science platform will be validated through a program of commissioning tests and will operate on a shared risk/best efforts basis. It is expected that continued construction of ASKAP (i.e.

installation and integration of further ADE systems) will continue during this period, meaning that science observing will most likely occur during the night. It is intended that the early science survey will undergo progressive sensitivity enhancement as additional Mk II receivers are taken into operation.

The total array time available for early science will be limited by other project priorities, the most pressing of these being commissioning. Under the current project plan, observations are expected to begin in early 2015 following the completion of approximately 6 months of basic commissioning on the 12-ADE array. From early 2015 onwards, the likely time available for scientific observations is two-thirds of the ~12 hour nights, including calibration and other observing overheads. Data from the program will be progressively released to the entire astronomy community once suitably verified. The early science program will continue until the complete ASKAP array is deemed ready to begin normal operations.

CASS will seek advice on the proposed ASKAP early science program from its advisory committees. This will include the ATNF Steering Committee (ATSC), the Australia Telescope User Committee (ATUC) and the ATNF Time Assignment Committee (TAC - augmented by experts on ASKAP science). CASS will consider the advice of the ATSC, ATUC and TAC and will aim to finalise the plans for the early science program by August 2013.

Lewis Ball
CASS Chief
3 May 2013

Consultation Schedule for ASKAP early science (all dates 2013)

May 6 th	A configuration for ASKAP-6, ASKAP-12, ASKAP-18 is proposed by CASS.
May 7 th	The early science plan, consultation schedule and proposed configuration sent to SST PIs.
May 9 th (ASKAP SST C&M Meeting)	CSIRO and SSTs discuss the early science plan and configuration. Fix a date for early science workshop.
May 15 th	ASKAP early science plan, configuration and consultation schedule sent to AAL, ANZSCC, ATSC, ATUC. Invite comments.
End May	Positions of the first six ADE antennas finalised and communicated to SEIC and ASKAP team. Work begins on antenna pedestals. ASKAP-12 and ASKAP-18 configurations remain as 'draft' until early science program is decided.
May 31st	CAASTRO strategy meeting
May-July	Advertise and discuss early science plan with Australian astronomy community in a series of visits to universities and institutes.
June-July	One-day workshop at CASS to develop a unified early scientific program in consultation with EMU, WALLABY and other survey science teams. Considerable leadership input by EMU and WALLABY PIs in this process will be encouraged.

	Follow-up meetings also encouraged as required.
July	Workshop report produced by ASKAP Project Scientist and EMU/WALLABY PIs, suggesting a unified early science plan.
July	Workshop report presented to SST C&M meeting and to AAL, ANZSCC, ATSC, ATUC. Feedback requested. Amendments made as required.
August	ASKAP early science plan finalised. Signed off by CASS Chief.