

ALMA Cycle I

Progressing to Array Completion



North American ALMA Science Center

Al Wootten

AAS 219

Atacama Large Millimeter/submillimeter Array
Expanded Very Large Array
Robert C. Byrd Green Bank Telescope
Very Large Baseline Array



The take-away message in one slide

- ALMA Cycle I is imminent; proposals will be due within the coming months
 - Call will be advertised by NAASC when issued
 - All the information you need is at the ALMA Science Portal at <https://almascience.nrao.edu>
- For help, contact the NAASC at NRAO using the Helpdesk link on the Science Portal
- Spend some time well in advance of the deadline to become familiar with the OT.

ALMA Cycle I

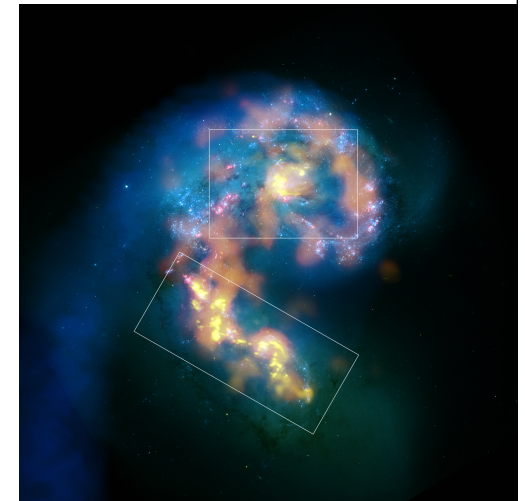
- Construction toward Full Science continues on target.
- Cycle 0 Science progressing with effort.
- Schedule for Cycle I to be announced soon.
- Expect proposal deadline mid-late Spring 2012.
- Observations expected to commence Fall 2012.





ALMA Cycle I - Antennas

- Main Array
 - 32 x 12m
 - Modified 50-antenna configurations
 - Baselines to 1km
 - 4-9 configurations.
 - Standalone mode
- Atacama Compact Array with
 - at least 6 x 7m and 1 x 12m.
 - One configuration for short spacing combination
 - No standalone mode, only used with Main Array



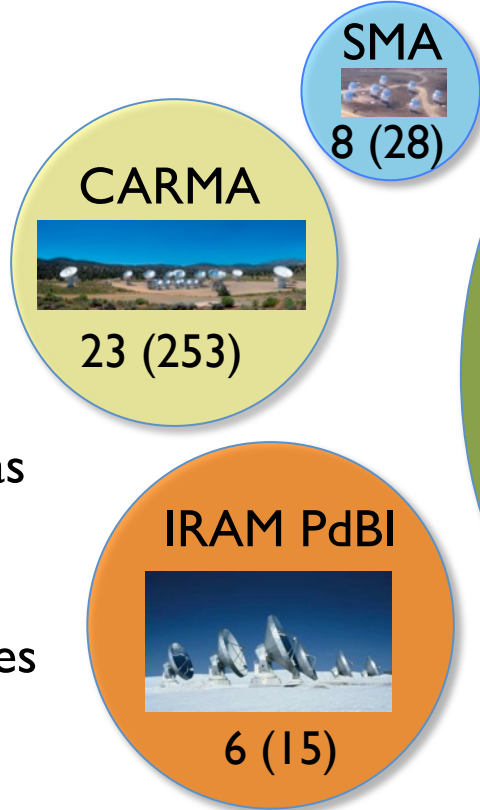
The Antennae

Mosaics: 150 pointings/schedule block

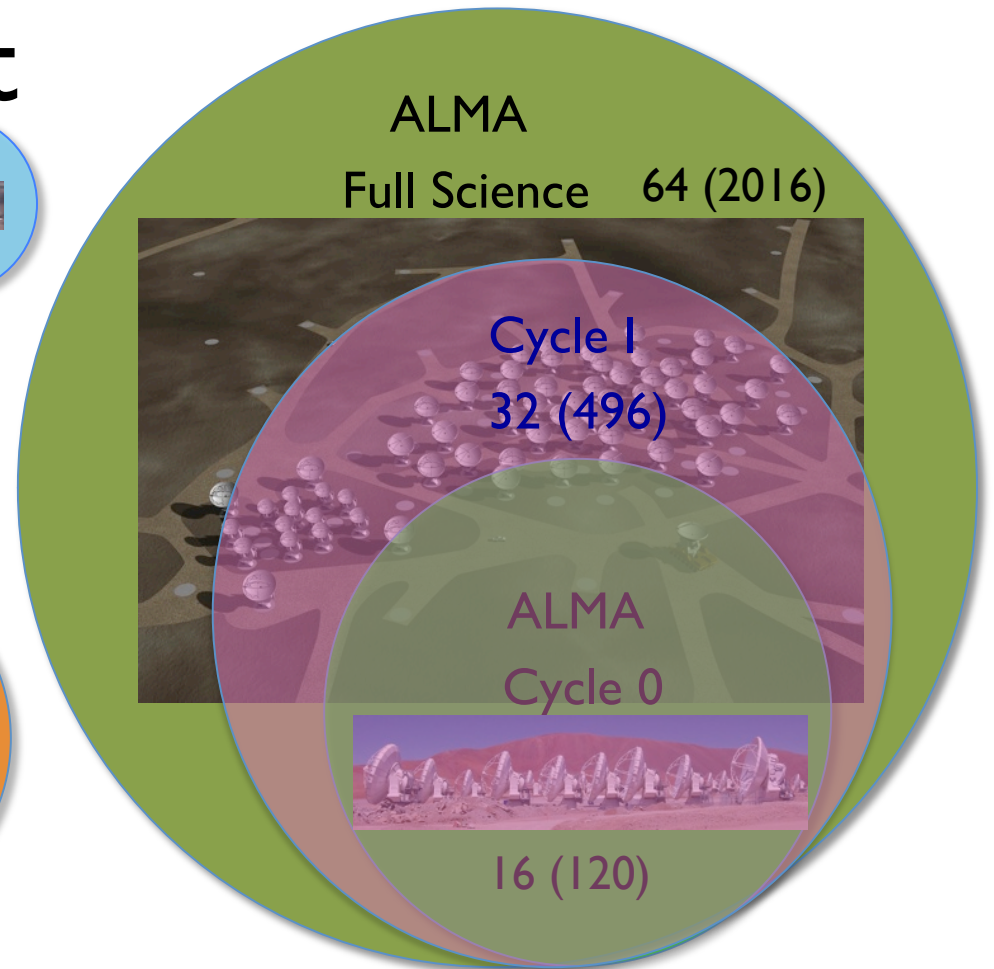
ALMA in Context

Collecting Area

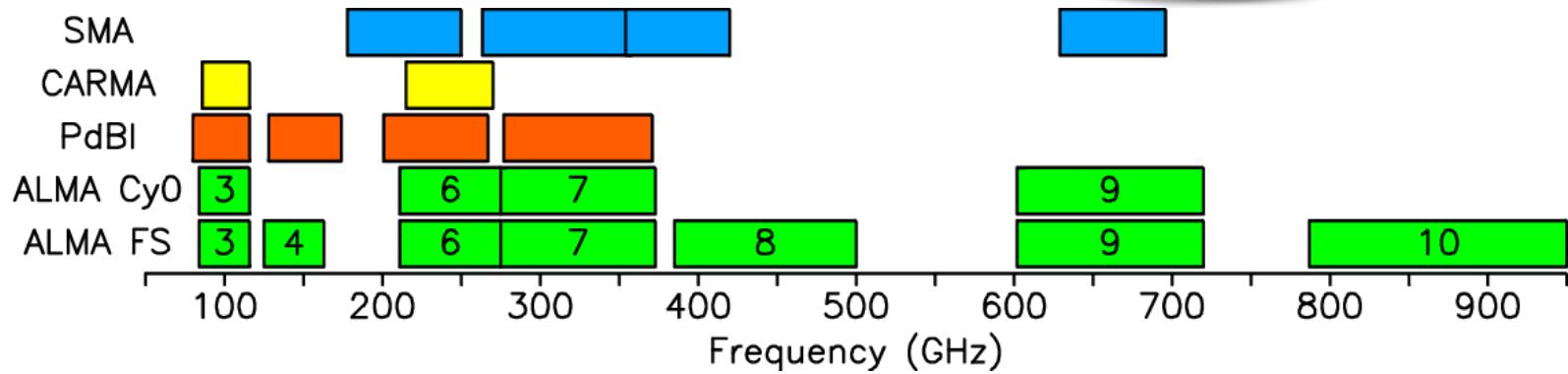
of Antennas
(# of baselines)



- Sensitivity goes as collecting area
- Image fidelity goes as # of baselines

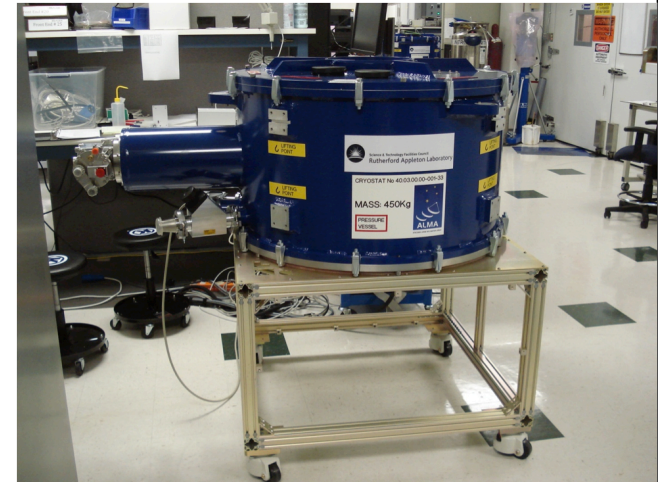


Spectral Coverage



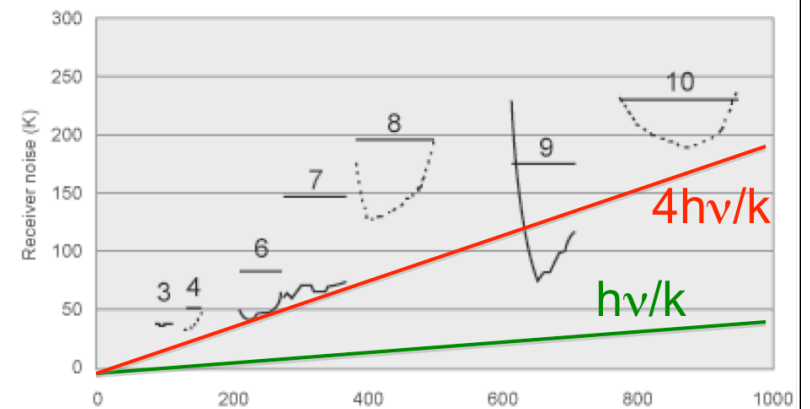
ALMA Cycle I - Antennas

- Receiver Bands:
 - Same as Cycle 0
 - Current
 - B3: 84-116 GHz (3mm)
 - B6: 211-275 GHz (1.3mm)
 - B7: 275-373 GHz (0.8mm)
 - B9: 602-720 GHz (0.45mm)



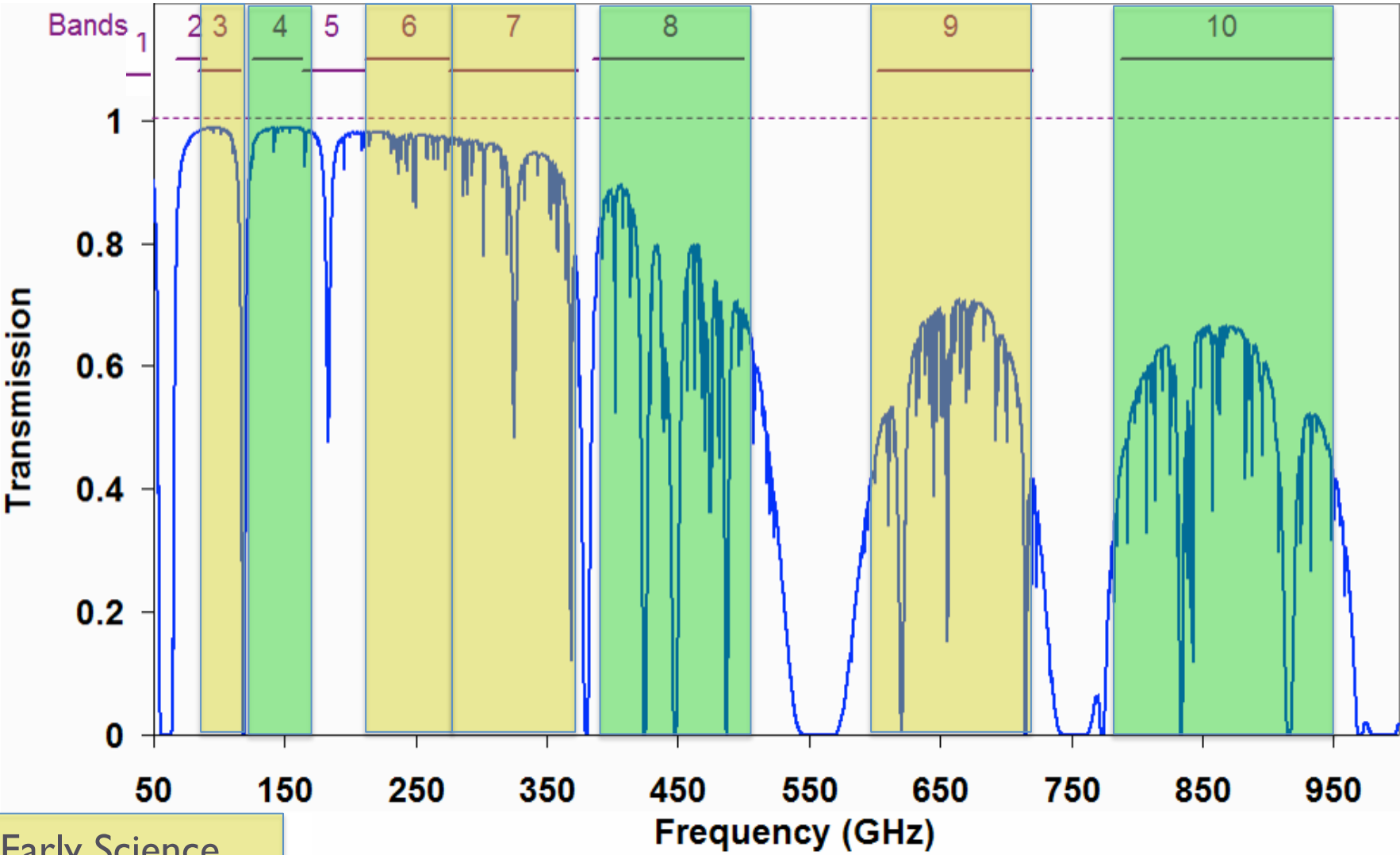
FE33 under construction at NRAO

ALMA Front End Noise Temperatures



N. B. B9 & B10 are DSB!

ALMA Receiver Bands



Early Science

Full Operations

AAS 219

ALMA Cycle I - Correlator

- Fourth Quadrant (and final) to be installed July 2012, completing hardware delivery
 - Capability to correlate up to 64 antennas
 - Add capability to do spectral averaging
 - Independent Bandwidth/Resolution in basebands
 - Independent baseband tuning, sideband separation
- ACA correlator installed, operating and will service that array

ALMA Cycle I – Program Considerations

- 1500 hours observing time as construction continues
- Special targets
 - Target of Opportunity
 - Director’s Discretionary Time
 - Scheduling sharpness only 1-2 weeks for time-specific requests
 - No large programs
 - No project transferral to Cycle 2

ALMA Cycle I-IMHO, What's Well-suited?

- Emission extended beyond primary beam needing imaging with fine fidelity
 - ACA necessity
 - Emission still fits within ~150 pointing mosaic
 - Emission with a range of spatial scales over this area
- Objects of Opportunity
 - Director's Discretionary Time for unexpected events with extreme urgency (γray bursts, Sne)
 - Targets of Opportunity – objects which may appear but are as yet unspecified (comets)

NRAO User Support

<http://almascience.nrao.edu>




The screenshot shows the ALMA Science Portal website. The main navigation bar includes links for Home, About NRAO, Science, Research Facilities, Observing, and Opportunities. A secondary navigation bar lists research facilities: ALMA/NAASC, EVLA, GB, VLBA, and NTC. The left sidebar contains a 'User Services at ARCs' section with links for Helpdesk, ALMA@ESO, ALMA@NRAO, and ALMA@NAOJ. A red arrow points to the ALMA@NRAO link, with the text 'User Support' written below it. The main content area features an 'Overview' section with a large image of ALMA antennas and a 'Call for Proposals' section.



User Support

almascience.nrao.edu

science.nrao.edu/alma



The Atacama Large Millimeter/sub-millimeter Array (ALMA), an international astronomy facility, is a partnership of Europe, North America and East Asia in cooperation with the Republic of Chile. ALMA is funded in Europe by the European Organization for Astronomical Research in the Southern Hemisphere (ESO), in North America by the U.S. National Science Foundation (NSF) in cooperation with the National Research Council of Canada (NRC) and the National Science Council of Taiwan (NSC) and in East Asia by the National Institutes of Natural Sciences (NINS) of Japan in cooperation with the Academia Sinica (AS) in Taiwan. ALMA construction and operations are led on behalf of Europe by ESO, on behalf of North America by the National Radio Astronomy Observatory (NRAO), which is managed by Associated Universities, Inc. (AUI) and on behalf of East Asia by the National Astronomical Observatory of Japan (NAOJ). The Joint ALMA Observatory (JAO) provides the unified leadership and management of the construction, commissioning and operation of ALMA.