NRAO

National Radio Astronomy Observatory

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

Preparing for ALMA

http://science.nrao.edu/alma

National Radio Astronomy Observatory

North America ALMA Science Center

Charlottesville, Virginia U.S.

Atacama Large Millimeter/submillimeter Array

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The North American ALMA Science Center

Carol J. Lonsdale
North American ALMA Science Center

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It's Time to Plan ALMA Science !!!!

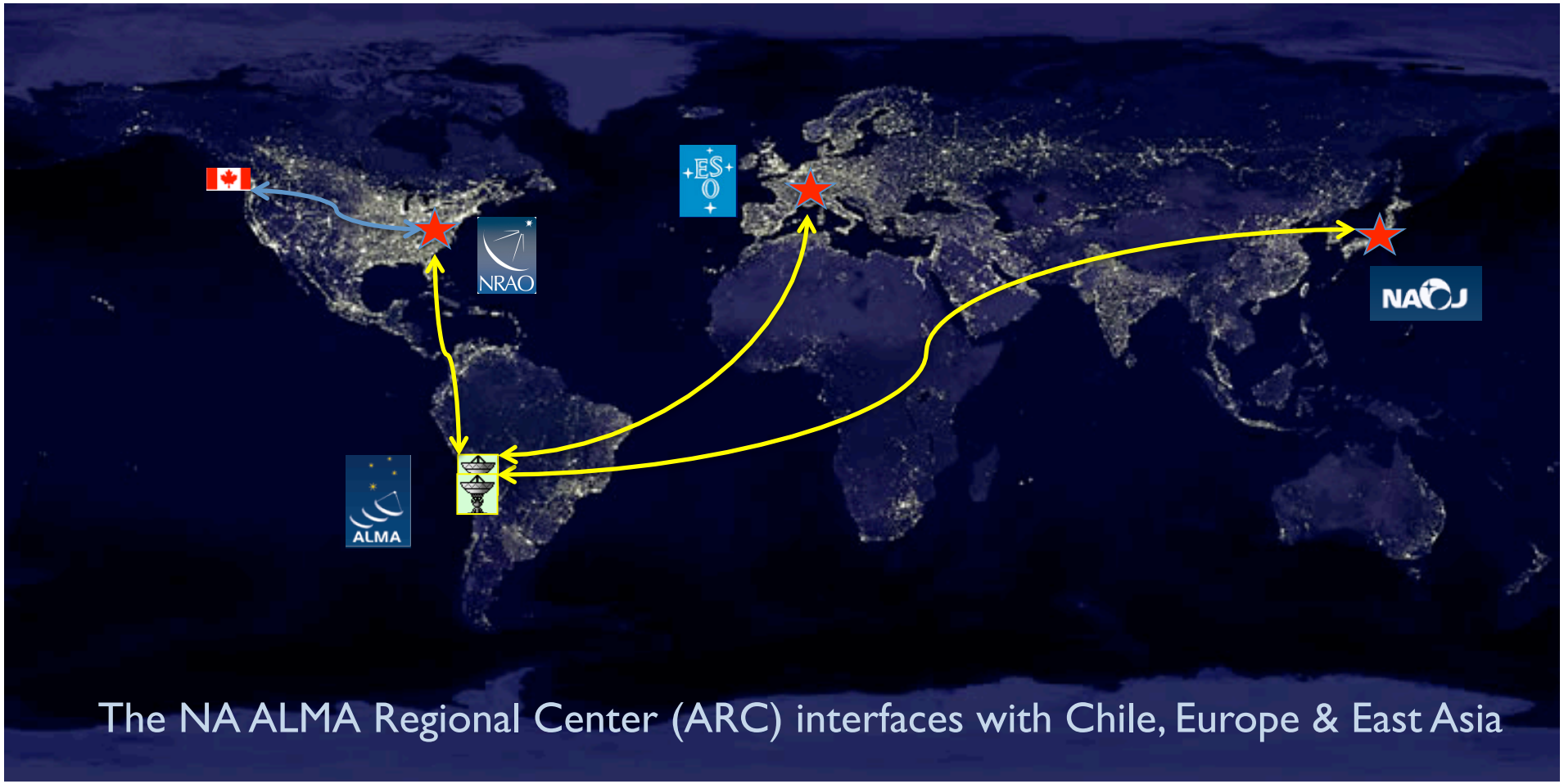
Four Antennas at the ALMA Site; May 2010

First Call for Proposals: December 2010

First Science Observations: July 2011

The North American ALMA Science Center

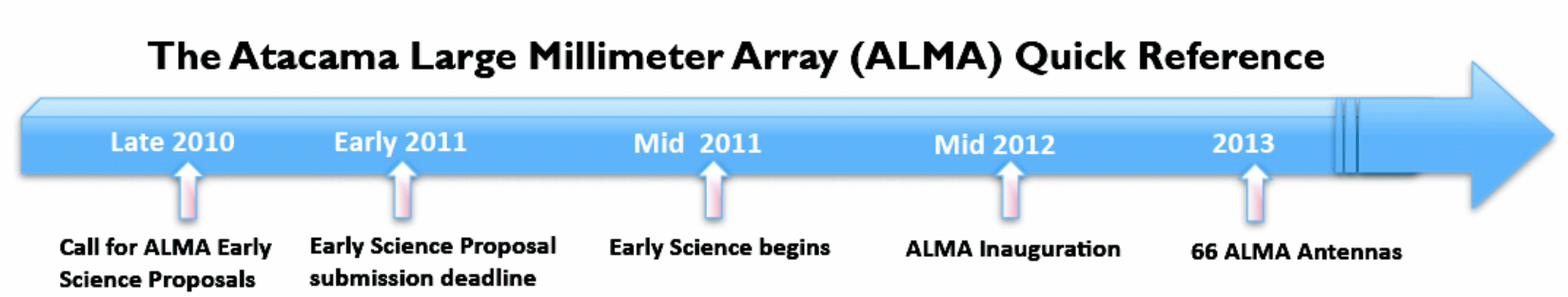
NAASC, NRAO, is the observer's interface to all things ALMA in North Am.



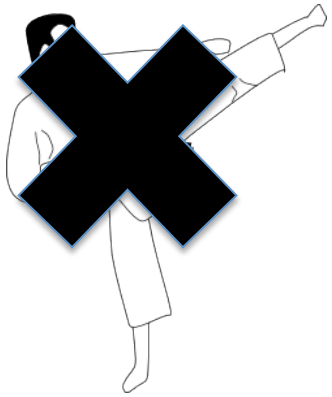
The NA ALMA Regional Center (ARC) interfaces with Chile, Europe & East Asia

Milestones

November 27, 2009:	Phase closure achieved with 3 antennas
January 22, 2010:	Start of Commissioning & Science Verification
October 2010:	Operations Readiness Review
December 2010:	First Call for Proposals
July 2011:	Start of Early Science operations; 16+ antennas
January 2012:	Science verification for 32 antenna
September 2012:	Inauguration: 50+ antennas in place
April 2013:	66 antennas in service



ALMA must be accessible to all



NAASC will provide:

- Calibrated reference images
  - All data will be image cubes
- On-line learning resources
- Workshops, tutorials & schools
- One-on-one support for visitors
- Student and Postdoc programs
- Financial Support:
  - Data reduction visits
  - Students working on ALMA data
  - Page charge support

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- About ALMA
- Early Science
- HelpDesk
- Proposal Preparation (Phase I)
- Observing Preparation (Phase II)
- Post-Observation: Data Processing
- Schedules
- Software & Tools
- Data Archive
- Financial Support
- Scientific Visitor Info
- People
- Publications
- ALMA Project Status and News Letters

ALMA: An Overview

Events

The Atacama Large
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Chilean Andes. The
sky required to oper
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ALMA: Capabilities and Specifications

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Some example

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Maximum Baseline
Angular Resolution

Early Science

When completed, ALMA will offer 50 antennas in its main array, 16 more in the ALMA Compact Array, a variety of configurations, a large number of observing modes (standard interferometry, mosaicing, fast-switching, etc.) and complete frequency coverage of the mm/submm windows up to 1 THz. However, ALMA will become a powerful, world-beating scientific instrument long before all these capabilities become available. In order to exploit this before the official Inauguration of the telescope, astronomers will be able to apply for time as part of Early Science.

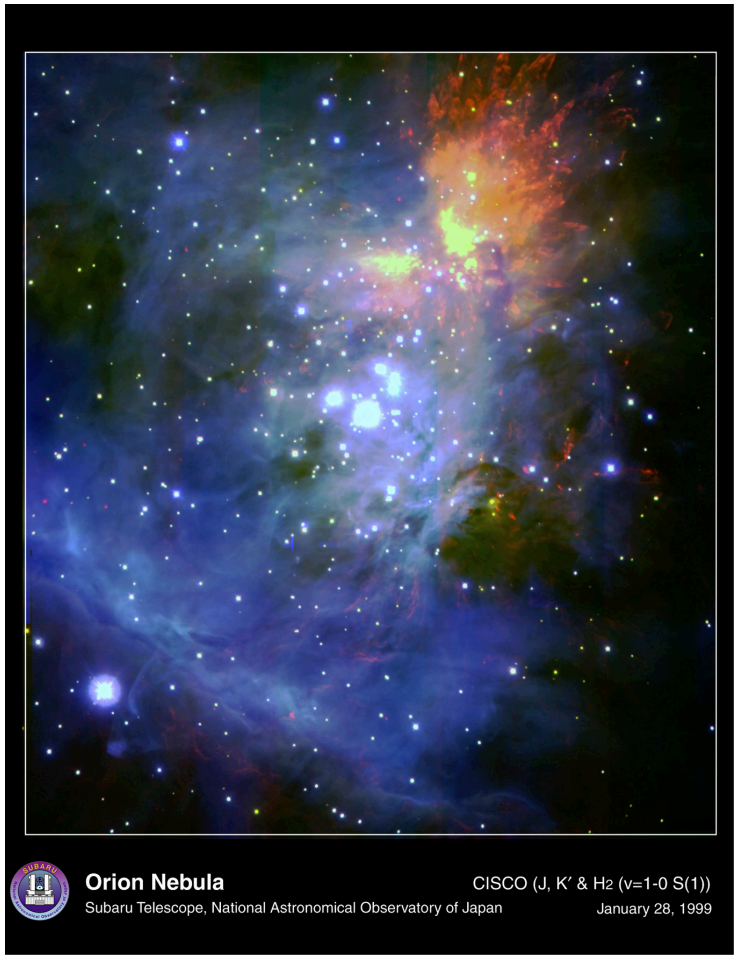
- Minimum Requirements for Early Science

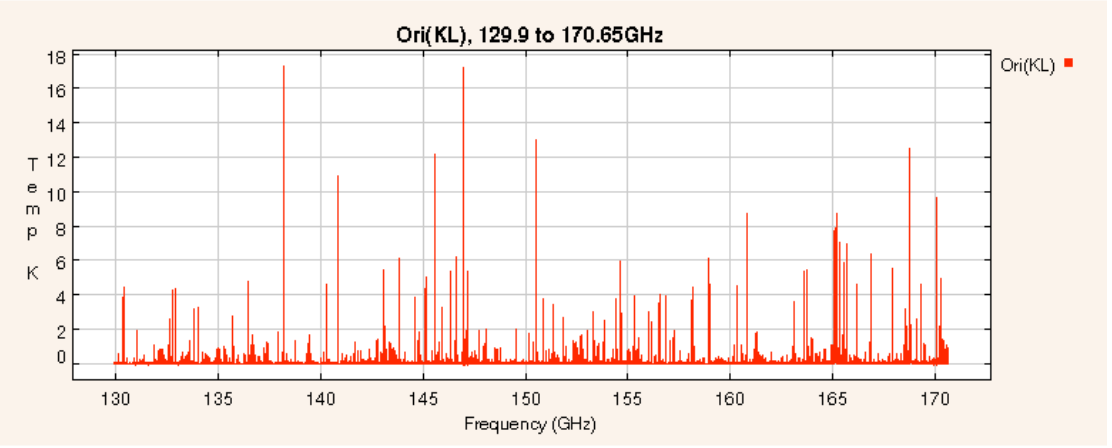
Early Science will only proceed once the following requirements have been met:

- Antennas: at least 16 12-m antennas fully commissioned
- Frequency bands: at least three on each antenna
- Array configurations: sufficient pads to cover the shortest spacings and out to a maximum baseline of 250 m
- Observing modes: single-field interferometry
- Correlator modes: a mixture of pseudo-continuum (Time Division Mode) and spectral line (Frequency Division Mode) correlator configurations. Around 20 modes are being commissioned for Early Science, but the highest priority has been given to the modes shown in the table below. See the table below or ALMA Memo 556 for more information on correlator modes
- Calibration: to a level already achieved on established mm arrays
- Software: tools required for proposal submission, preparation and execution of observations and data reduction in place

Once these are met, the Early Science Decision Point (ESDP) will see the release of the very first Call for Proposals to the astronomical community. The deadline for the receipt of proposals (submitted with the ALMA Observing Tool) will be two months after the ESDP and Early Science observations will begin six months after that i.e. eight months after the ESDP. Information on when these will occur can be found in the ALMA timeline

The Complex mm Spectrum

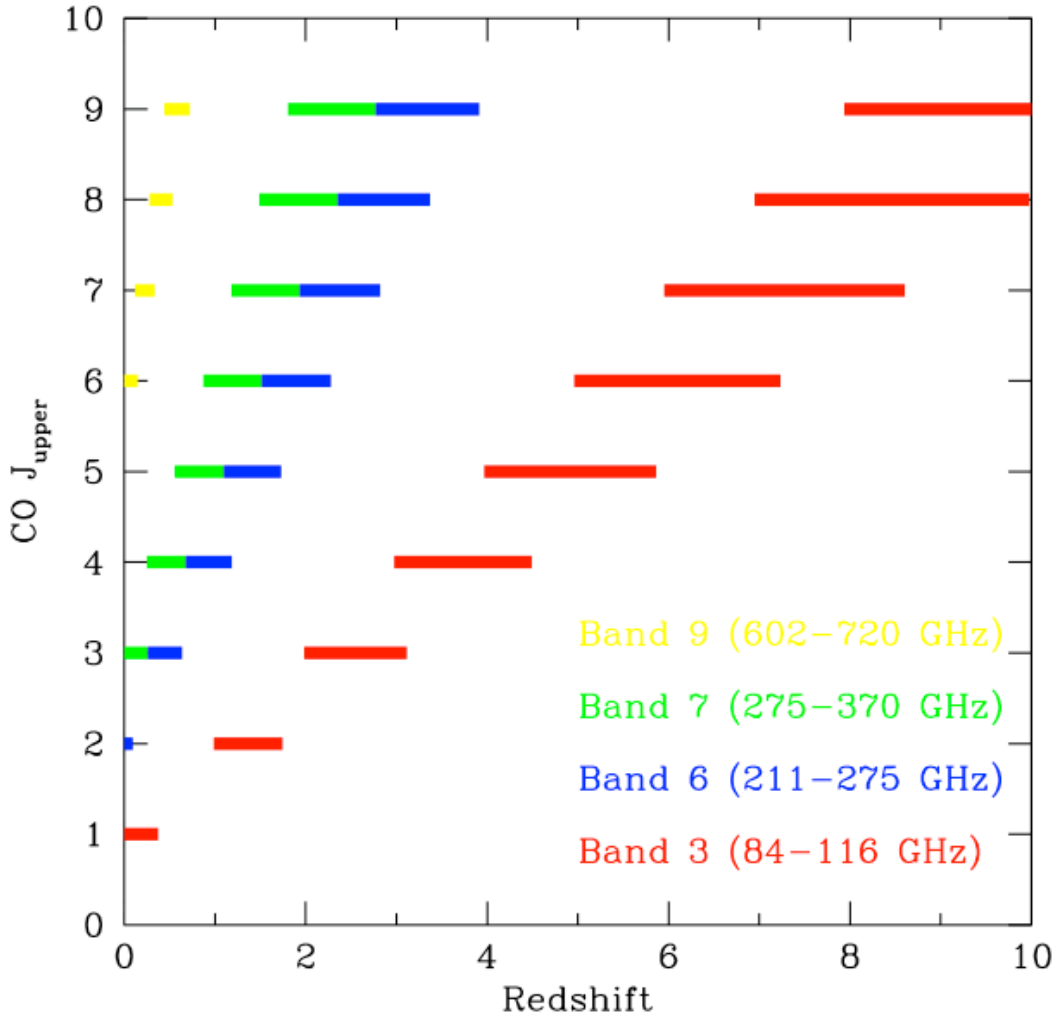




- Most of the observed transitions of the 142 known interstellar molecules lie in the mm/ submm spectral region.
- Here 1000s lines are seen in a small portion of the spectrum at 2mm.

Slide courtesy of Al Wootten

CO transitions at high z



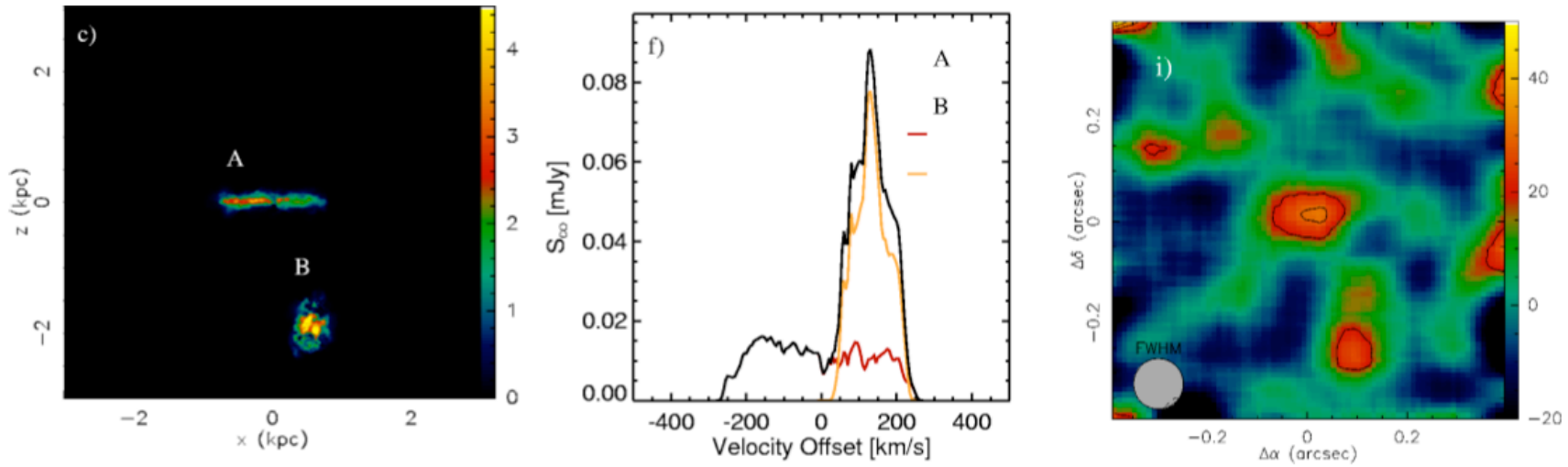
CO Line Emission from Lyman Break Galaxies

Greve & Sommer-Larson 2008

z=3.26

Simulation

CO(4-3) map, 0.1" resolution

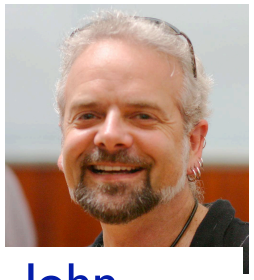


Meet The NAASC


Carol Lonsdale


Crystal Brogan


Al Wootten


John Hibbard


Todd Hunter


Jeff Mangum


Brian Kent


Remy Indebetouw


Aaron Evans


Rachel Friesen


Mark Lacy


David Mehringer


Kartik Sheth


Tony Remijan


Harvey Liszt

PREPARING FOR ALMA

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