ALMA Early Science Software Tutorial
Victoria, BC  18 January 2011

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Logistics

• Wireless network: ALMA2011
  • Password: Alma2011

• Breakfast, lunch, & breaks here!

• Evaluation forms:
  • Please fill out!
Purpose of the Tutorial

• Introduction to resources available to potential users of ALMA

• Walk-through of the basic software you’ll need to prepare a proposal to use ALMA during *Early Science*

  • This morning explore the Observing Tool (OT)

  • This afternoon discover *simdata*, the ALMA data simulator in CASA

  • Time to “play” with these tools, to create your own *Early Science* proposal
Who’s here to help you?

Brenda Matthews
James Di Francesco
Doug Johnstone
Me!

Tony Remijan
Scott Schnee
Kartik Sheth
Rachel Friesen
Crystal Brogan
Harvey Liszt
What is *Early Science*?
ALMA currently
ALMA later this year
**What is Early Science?**

The Atacama Large Millimeter Array (ALMA) Quick Reference

<table>
<thead>
<tr>
<th>Bands:</th>
<th>Early Science</th>
<th>Array Completion</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frequency (GHz)</td>
<td>3: 84-116</td>
<td>5: 163-211</td>
</tr>
<tr>
<td>Wavelength (mm)</td>
<td>3.57-2.59</td>
<td>1.84-1.42</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Antennas</th>
<th>≥ 16 x 12m</th>
<th>At least 54 x 12m &amp; 12 x 7m</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bands</td>
<td>Bands 3, 6, 7, 9</td>
<td>Bands 3, 4, 6, 7, 8, 9 &amp; 10</td>
</tr>
<tr>
<td>Maximum Bandwidth</td>
<td>16 GHz (2 polarizations x 8 GHz)</td>
<td></td>
</tr>
<tr>
<td>Correlator Configurations</td>
<td>21 (0.02 – 40 km/s)</td>
<td>71 (0.01 – 40 km/s)</td>
</tr>
<tr>
<td>Maximum Angular Resolution</td>
<td>0.02&quot; $\frac{\lambda}{1 \text{ mm}}$</td>
<td>$\frac{10 \text{ km}}{\text{Max Baseline}}$</td>
</tr>
<tr>
<td>Max Baseline</td>
<td>250m (may achieve 500m)</td>
<td>15 km</td>
</tr>
<tr>
<td>Continuum Sensitivity (60 sec, Bands 3–9)</td>
<td>~0.2 – 4.2 mJy</td>
<td>~0.05 – 1 mJy</td>
</tr>
<tr>
<td>Spectral Line Sensitivity (60 sec, 1 km/sec, Bands 3–9)</td>
<td>~30 – 250 mJy</td>
<td>~7 – 62 mJy</td>
</tr>
</tbody>
</table>

Sensitivity Calculator: [http://science.nrao.edu/alma/tools.html](http://science.nrao.edu/alma/tools.html)
The ALMA Early Science Primer

- 40 pages of useful information about ALMA Early Science, written in plain language for non-experts

- project led by NRC-HIA, after successful earlier version made for Hamilton 2008 ALMA workshop; many contributions by the NA, EU, and EA regional centers

- Contains concise descriptions of:
  - Early Science capabilities
  - proposals
  - examples of possible projects
  - interferometric concepts
  - expected data flow

- Also available on the web at http://almatelescope.ca/ALMA-ESPrimer.pdf
The North American ALMA Science Center

- Services include:
  - Supporting community preparation of ALMA proposals
  - Providing post-observation user support
  - Maintaining ALMA websites, proposal & data reduction guides
  - Organizing ALMA meetings / workshops
  - Visiting institutions to give presentations on ALMA
  - Supporting Commissioning and Science Verification efforts

- The HIA Millimetre Astronomy Group also provides support to the community through:
  - Helpdesk support
  - Tutorials & workshops across Canada
  - User documentation (like the Primer)
  - User support for proposal preparation, post-observation, etc.
The North American ALMA Science Center

- Getting access to this help starts at
- http://science.nrao.edu/alma  ↩ start here
ALMA Early Science and NAASC Community Training Events

Image courtesy ALMA (ESO/NAOJ/NRAO).

The ALMA Board, at its meeting on November 16-18, 2010 enthusiastically endorsed the progress of the ALMA project and announced that the first Call for Proposals is expected by the end of the first quarter of 2011. They noted that “ALMA is on track to begin Early Science observations late in 2011, as planned. While many challenges remain, it is already clear that ALMA ‘works’. It is anticipated that the ALMA Director will issue a Call for Proposals for Early Science in the first quarter of 2011. That announcement will provide more details of the expected timeline and capabilities to be offered.” The full November 2010 ALMA Board announcement, including recent ALMA test data images, is available on-line.

To prepare the North American community to fully participate in the Early Science (ES) call, the North American ALMA Science Center (NAASC) will organize community outreach and training events each month leading up to the proposal deadline. The first of these events will
For all questions related to observing within NRAO please use the NRAO HelpDesk. To log in, use the same user ID and password as when accessing the Proposal Submission Tool or the Observation Preparation Tool. If you haven't registered yet, please do so first at NRAO Interactive Services.

For department related questions (ALMA, EVLA, GBT, VLBA, CASA, AIPS, etc.), please select the appropriate department during the ticket submission process. Click here for a direct link to the NRAO HelpDesk log in page.
• On March 1, access to the Helpdesk will be through the ALMA User Portal
• http://almascience.org
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• It will also be where you access the ALMA OT, and other tools like the Sensitivity Calculator
What about face-to-face help?

• Astronomers can spend time in Charlottesville to receive help from the NAASC staff
  • Short-term (~a week)
  • Long-term (several weeks to months)
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  - Can be arranged by filing a Helpdesk “ticket”

- Facilities for similar visits to HIA are being developed
NAASC Tutorials & Community Events

Planned Tutorials:

- Jan 18, Victoria, BC
- Feb 24-25, Charlottesville, VA
- Mar 11, Santa Fe, NM
- Apr 26-27, Charlottesville, VA
- April ??, Toronto, ON
- May 9-10, Charlottesville, VA
- May ??, Calgary AB
- May 22-26, Boston, MA (AAS)

• Pre-registration for the In-House & Santa-Fe + Boston Tutorials now open

• A number of regional Community Events Day(s) is under consideration
  • Proposals from Hawaii, Boston area (CfA-Harvard) received
  • Expecting proposals from Southern California, Arizona, New York/New Jersey & Baltimore/DC area – deadline is Feb 1!