

The Global ALMA EPO Program: Communicating Astronomy with the Public at mm & submm Wavelengths

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HARDY

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ALMA ~ Atacama Large Millimeter/submillimeter Array

- ◆ *Radio telescope array of 66 high-precision mm/submm antennas*
 - ◆ *Fifty 12m diameter antennas*
 - ◆ *Twelve 7m + four 12m antennas = ACA*
- ◆ *International collaboration: North America (NRAO), Europe (ESO), East Asia (NAOJ), Chile*

2003 Construction Start

2007 First Antennas

2010 Early Science

2013 Full Science Ops



ALMA Location

- ★ *mm/sub-mm radiation strongly absorbed by atmospheric water vapor*
- ★ *ALMA must be located at a very dry, high altitude site*
- ★ *Telescope array extent requires a large, relatively flat area*
- ★ *Chajnantor plain in northern Chile (Atacama Desert)*



ALMA Location Altiplano de Chajnantor Region II, Chile





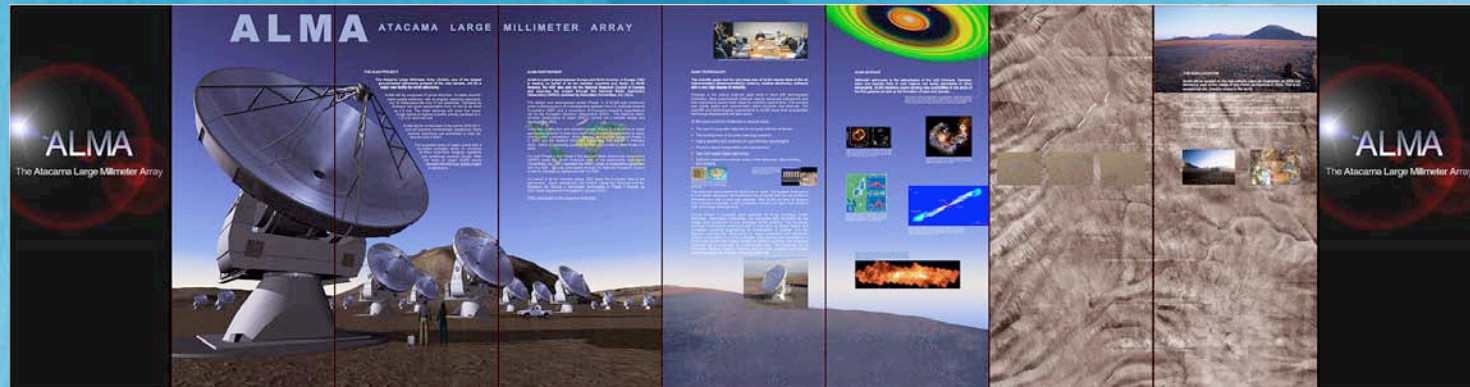
ALMA EPO Roles

- ◆ *ALMA EPO Working Group organized Aug 06 (IAU General Assembly) to provide oversight & a forum for communication & collaboration*
- ◆ *EPO organizations at NRAO / ESO / NAOJ collaborate on international & Chilean EPO that is coordinated by JAO*
- ◆ *NRAO / ESO / NAOJ lead regional programs*
 - ◆ *NRAO leads North American ALMA EPO*
 - ◆ *ESO leads European ALMA EPO*
 - ◆ *NAOJ leads East Asian ALMA EPO*



ALMA EPO Science Community Outreach

Europe: JENAM, EuroScience Open Forum



North America: AAS, AAAS

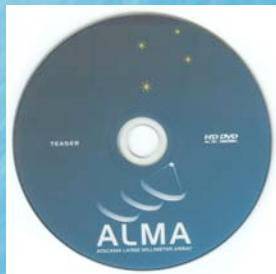




ALMA EPO

News & Public Information

- ◆ *Press releases / conferences / receptions*
 - ◆ *News, image, video releases: joint & regional*
 - ◆ *Major construction milestones now*
 - ◆ *When Early Science is achieved in 2010, ALMA science will dominate*
- ◆ *Brochures, DVDs, books ...*
- ◆ *WWW, podcasts/vodcasts ...*
- ◆ *Public exhibitions*



ALMAはどのようにして暗黒の宇宙をえがき出すのか

1 電波を捉える
2 電波を増幅する
3 受信機号を光で送る
4 情報を干渉させる
5 画像を合成する
6 観測データを画像化する

バンド	観測周波数 (GHz)	波長 (mm)
1	30 - 40	-
2	62 - 90	-
3	84 - 110	3.5mm
4	115 - 130	2.2mm
5	143 - 211	1.3mm
6	215 - 270	1.1mm
7	275 - 370	0.8mm
8	385 - 500	0.6mm
9	600 - 750	0.4mm
10	840 - 950	0.3mm



ALMA EPO

News & Public Information

- ◆ *NRAO / ESO / NAOJ documenting ALMA via videography & photography*
- ◆ *Many compelling stories to tell ...*
 - ◆ *Science: New window on celestial origins*
 - ◆ *Technology: antennas, receivers, transporter ...*
 - ◆ *People: scientists, engineers, construction "heroes"*
 - ◆ *Atacama Desert: people, culture, flora, fauna*





ALMA EPO

Astronomical Data Visualization

- ◆ *High quality astronomical images critical to engaging the public & the media*
- ◆ *Must be able to routinely produce compelling visualizations (images, graphics, illustrations, animations) for EPO products*
- ◆ *Must also develop techniques to create multi-wavelength composite images*
- ◆ *ALMA will invest in mm/submm data visualization and support the marriage of ALMA art & science*



ALMA EPO Public Affairs

- ◆ *Actively promote ALMA science / technology / value to the Chilean national & regional government*
- ◆ *Establish & maintain excellent relations with Chilean communities: San Pedro de Atacama & Toconao*
- ◆ *Be excellent stewards of the ALMA Scientific Preserve*
 - ✓ *Conserve archeological artifacts & sites*
 - ✓ *Conserve the regional flora & fauna*





ALMA EPO

Formal Education

- ◆ *K-12 curriculum support products created in accord with appropriate education standards, subjected to rigorous evaluation*
- ◆ *ALMA Interdisciplinary Teaching Project*
- ◆ *Host teacher professional development training & workshops*
- ◆ *Develop tools for educators to explore ALMA data in classroom*





ALMA EPO

Informal Education

- ◆ *Create compelling multi-media products & distribute via existing infrastructure such as ViewSpace*
- ◆ *Planetarium shows: "Exploring the Cold Universe"*
- ◆ *Effectively use new technologies such as video podcasts, Virtual Astronomy Multimedia Project, World Wide Telescope*
- ◆ *Incorporate ALMA into exhibits at existing science centers*
- ◆ *ALMA Visitor Center planned in Chile ~ 2013*





ALMA EPO Summary

- ◆ *Global ALMA EPO program has been initiated by the NRAO, ESO, NAOJ, and the JAO*
 - ◆ *Science Community Outreach*
 - ◆ *News & Public Information*
 - ◆ *Formal & Informal Education*
 - ◆ *Astronomical Data Visualization*
 - ◆ *Public Affairs*
- ◆ *ALMA is an extraordinary astronomical observatory that will open new science frontiers*
- ◆ *ALMA is an extraordinary opportunity to communicate astronomy to the public*

