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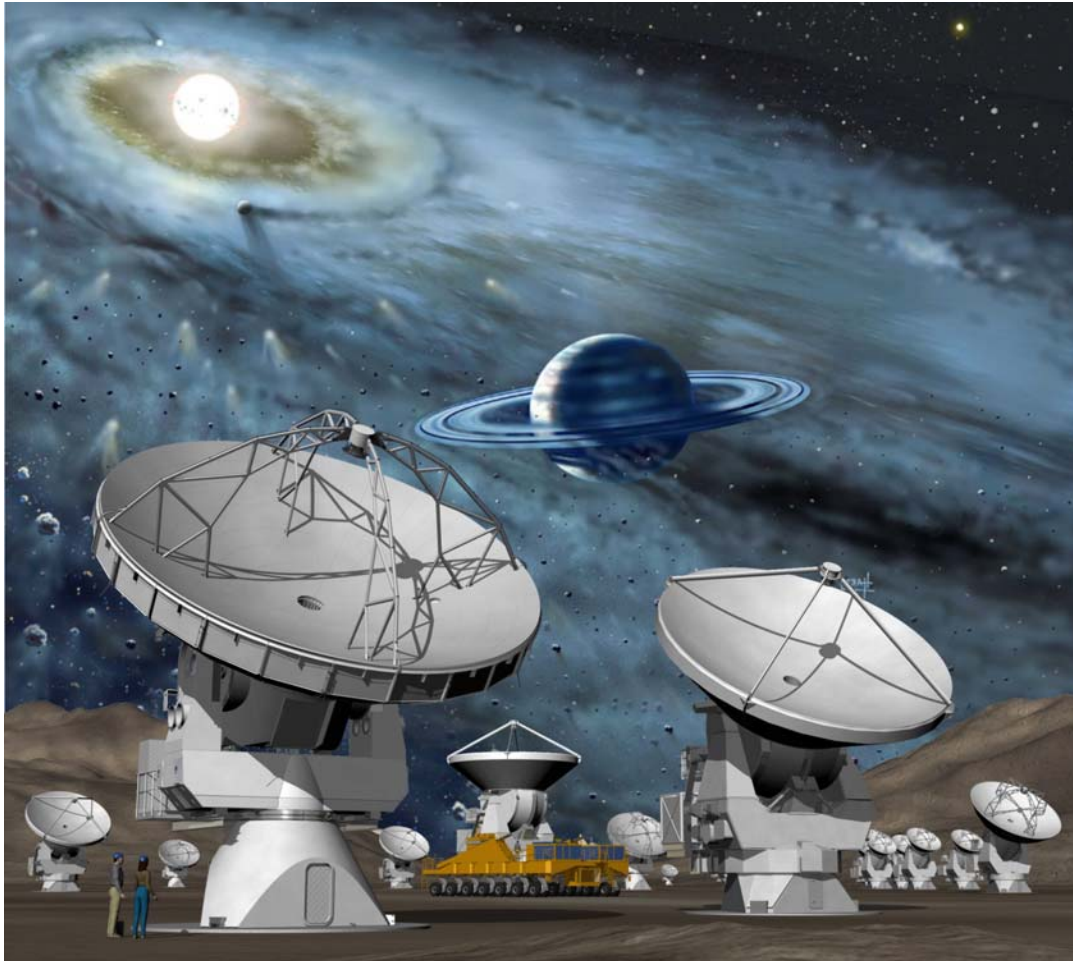
Subject: ALMA Education and Public Outreach Development Plan

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ALMA Education and Public Outreach



Development Plan



Revision 1.0

March 2007

*The Atacama Large Millimeter/submillimeter Array
Education and Public Outreach
Development Plan
rev 1.0: March 15, 2007*

Executive Summary

The Education and Public Outreach (EPO) development plan for the Atacama Large Millimeter/submillimeter Array (ALMA) describes the path to a global EPO program that effectively communicates the excitement, discovery, and value of the ALMA mission, science, and technology to the broadest possible international audience. This development plan assumes that vision, leadership, and excellence in astronomy education and public outreach are mandates for the ALMA EPO program.

The Joint ALMA Observatory (JAO) is responsible for leading the ALMA EPO program elements that communicate with international and Chilean audiences. The EPO organizations of the ALMA Executives collaborate with the JAO in the implementation of these international and Chilean program elements, contributing expertise, resources, and leadership, as appropriate. This collaboration is particularly important for the near-term future since the JAO is hiring its first EPO staff in 2007.

The three ALMA Executives are also responsible for leading ALMA EPO programs in their regional communities. Thus, Associated Universities, Inc./National Radio Astronomy Observatory (AUI/NRAO) leads the ALMA EPO program in North America; the European Organisation for Astronomical Research in the Southern Hemisphere (ESO) leads the ALMA EPO program in Europe; and the National Institutes of Natural Sciences/National Astronomical Observatory of Japan (NINS/NAOJ) leads the ALMA EPO program in East Asia. Each of the Executives has already initiated an ALMA EPO program; and these programs are expanding in scope and capability.

The global ALMA EPO program is thus the sum of the international, Chilean, North American, European, and East Asian ALMA EPO programs conducted by the JAO and the ALMA Executives.

To achieve and maintain the high public and media profile that ALMA science and technology deserve, the ALMA EPO program must be visionary in scope and have the resources to enable it as an international leader in astronomical education and public outreach. The Hubble Space Telescope (HST) Office of Public Outreach (OPO) has established the modern standard for astronomical education and public outreach. The public and the media's high awareness and appreciation of HST science and technology are direct results of NASA's policy of significant, long-term outreach investment. Achieving the ALMA EPO vision will require resources that are at least broadly comparable to those of the HST OPO.

In 2007, the Executives are increasing their investments in ALMA EPO, and the JAO ALMA EPO program is beginning. An ALMA EPO Working Group has been recently organized and formally chartered to define, implement, and provide oversight for the global ALMA EPO mission, vision, and program. The Executives and the JAO are collaborating through this Working Group to craft an ALMA EPO Strategic Plan for 2008 through 2012, an ALMA EPO Long Range Plan for the same five-year period, an ALMA EPO Policies & Procedures manual, and an inventory of ALMA-related EPO products and materials that have been created by the Executives' EPO organizations to date. An overview of current and proposed ALMA EPO program elements is provided, as is a summary of the JAO ALMA EPO Program for CY 2007.

1. Introduction

This Education and Public Outreach (EPO) development plan for the Atacama Large Millimeter/submillimeter Array (ALMA) describes the path to a global EPO program that effectively communicates the excitement, discovery, and value of the ALMA mission, science, and technology to the broadest possible international audience. This development plan assumes that vision, leadership, and excellence in astronomy education and public outreach are mandates for the ALMA EPO program.

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The three ALMA Executives are also responsible for leading ALMA EPO programs in their regional communities. Thus, Associated Universities, Inc./National Radio Astronomy Observatory (AUI/NRAO) leads the ALMA EPO program in North America; the European Organisation for Astronomical Research in the Southern Hemisphere (ESO) leads the ALMA EPO program in Europe; and the National Institutes of National Sciences/National Astronomical Observatory of Japan (NINS/NAOJ) leads the ALMA EPO program in East Asia. Each of the Executives has already initiated an ALMA EPO program; and these programs are expanding in scope and capability.

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The ALMA era will see the debut of several other large and capable telescope systems. The James Webb Space Telescope (JWST), funded by the U.S. National Aeronautics and Space Administration (NASA), for example, is scheduled for launch to orbit in 2013. The Giant Segmented Mirror Telescope (GSMT), funded entirely or in part by the U.S. National Science Foundation (NSF), is expected to achieve science operations in ~ 2015, as is the European Extremely Large Telescope (E-ELT), funded by ESO. Other new large telescope systems that will complete construction and operate in the ALMA era include Herschel, the Expanded Very Large Array (EVLA), and the Large Synoptic Survey Telescope (LSST).

Each of these new major telescope systems will expend ~ \$50M to \$1B+ USD for construction, and will have annual operations budgets of ~ \$5M to \$100M+ USD. Since these observatories are being funded all or in large part by the public, each will implement an EPO program that seeks to compellingly convey its science, technology, and value for the maximum public dividend. Though the major ALMA era telescopes will often be employed in a complementary manner for multi-wavelength scientific research campaigns, they will often compete with each other for the attention of the public and the media. To achieve and maintain the high public and media profile that ALMA science and technology deserves, the ALMA EPO program must be visionary in scope and have the resources that enable it to be an international leader in astronomical education and public outreach.

The Hubble Space Telescope (HST) Office of Public Outreach, funded by NASA, has established the modern “gold standard” for astronomical education and public outreach. The HST OPO employs a large staff of skilled professionals that includes

graphic designers, media specialists, educators, writers, video animators, producers, technical personnel, and managers. The FY 2006 budget for the HST OPO is \$4.2M USD for its core program elements, including \$2.18M USD for News & Public Affairs, \$0.81M USD for Formal Education, \$0.87M USD for Informal Education, and \$0.36M USD for public web-site development. The public and the media's high awareness and appreciation of HST science and technology are direct results of NASA's policy of significant, long-term outreach investment. Achieving a comparable profile for ALMA will require comparable EPO resources.

The Executives are increasing their investments in ALMA EPO, and the JAO ALMA EPO program is beginning. An ALMA EPO Working Group has been organized and formally chartered to define, implement, and provide oversight for the global ALMA EPO mission, vision, and program. This Working Group's charter, responsibilities, membership, and operations are described in Section 2.

The Executives and the JAO are collaborating through this Working Group to craft an ALMA EPO Strategic Plan for the years 2008 through 2012 (Section 3), an ALMA EPO Long Range Plan (Section 4) for the same five-year period, an ALMA EPO Policies & Procedures manual (Section 5), and an inventory of ALMA-related EPO products and materials that have been created by the Executives' EPO organizations to date (Section 6). An overview of current and proposed ALMA EPO program elements is in Section 7. The JAO ALMA EPO Program for CY 2007 is summarized in Section 8.

2. ALMA EPO Working Group

The ALMA EPO Working Group (hereafter simply the “Working Group” or “WG”) held its inaugural organizational meeting on 23 August 2006, during the International Astronomical Union (IAU) General Assembly in Prague. Since this initial meeting, the ALMA EPO Working Group has been formally chartered to:

- *Develop a global ALMA EPO program that is a cooperative and collaborative endeavor of the JAO, AUI/NRAO, ESO, and NINS/NAOJ.*
- *Provide oversight for a global ALMA EPO program that communicates the science, technology, and value of ALMA in a timely and effective manner to professional and amateur astronomers, the world-wide general public, students and teachers of all ages and nationalities, and the international electronic and print media.*
- *Draft and periodically update a 5-year global ALMA EPO Strategic Plan.*
- *Draft and periodically update a 5-year global ALMA EPO Long Range Plan.*
- *Design and implement appropriate ALMA EPO Policies & Procedures.*
- *Design and implement an annual global ALMA EPO Program Plan.*
- *Design and implement performance metrics that quantify the global ALMA EPO Program effectiveness and reach.*

The WG has twelve (12) members and includes representatives from the EPO and scientific organizations of the Executives and the JAO. The persons filling these WG positions in CY 2007 are given in Table 2-1.

Table 2-1: ALMA EPO Working Group Membership (CY 2007)

<i>Name</i>	<i>Position</i>
1. Mark Adams	NA Exec PR
2. Henri Boffin	EU Exec PR
3. Seiichi Sakamoto*	JP Exec PR
4. Al Wootten	NA Exec PS
5. Robert Laing**	EU Exec PS
6. Ryhoei Kawabe	JP Exec PS
7. Richard Hills***	JAO PS
8. Eduardo Hardy	NA Exec Rep in Chile
9. Felix Mirabel	EU Exec Rep in Chile
10. Ryusuke Ogasawara	JP Exec Rep. in Chile
11. [TBD]****	JAO PR
12. Massimo Tarengi	ALMA Director

PS = Project Scientist; PR = Public Relations; Exec = Executive; Rep = Representative

NA = North American Executive; EU = European Executive; JP = Japanese Executive

**Replacement for Seiichi Sakamoto will be nominated later.*

***From April 2007 on Leonardo Testi will replace Robert Laing.*

**** Robert Hills officially joins the JAO in November 2007.*

***** JAO PR position to be filled April 2007.*

The JAO Public Relations (PR) position has been defined, recruiting is underway, and the successful candidate for this position is expected to officially join the JAO in April 2007. When the JAO PR position is filled, this person will become the WG Chair. Until that time, the NA Exec PR will function as the WG Chair.

Since its inception, the WG has met via teleconference at least monthly. In addition, a half-day face-to-face meeting was convened as an adjunct to the ALMA science meeting in Madrid, Spain in mid-November 2006. Future face-to-face meetings will be conducted at least annually. The host site will rotate between Europe, North America, Japan, and Chile as noted in Table 2-2. These face-to-face WG meetings will be scheduled in the August – November timeframe each year.

Table 2-2: ALMA EPO Working Group Face-to-Face Meetings (2006 – 2013)

<u>Location</u>	<u>Host Years</u>
<i>Europe</i>	<i>2006, 2010</i>
<i>North America</i>	<i>2007, 2011</i>
<i>Japan</i>	<i>2008, 2012</i>
<i>Chile</i>	<i>2009, 2013</i>

To assist in executing its responsibilities, the ALMA EPO WG has established an e-mail exploder (almaepo@donar.cv.nrao.edu) and a wiki (<http://www.nrao.edu/almaepo>).

3. ALMA EPO Strategic Plan

In 2007, the WG will draft a five-year ALMA EPO Strategic Plan for the period 2008 through 2012. This Strategic Plan will guide the long-term development and implementation of the global ALMA EPO program vision from the present through Early Science to the completion of ALMA construction and the initiation of full-up ALMA Operations in 2012.

This strategic plan will develop and define the ALMA EPO mission and vision. The adopted mission and vision will be propagated into a consistent set of strategic goals that are specific, measurable, meaningful, actionable, and realistic. Strategic initiatives will be developed that support these goals. A planning horizon of 2012 for this strategic planning activity has been selected since ALMA will become fully operational at this time.

To initiate the strategic planning process, the ALMA EPO Working Group has recently drafted mission and vision statements.

A mission statement should be a succinct statement of purpose that specifies an organization's fundamental reason for being. The WG's draft mission statement for the ALMA EPO Program is below.

ALMA EPO MISSION STATEMENT [DRAFT]

The ALMA Education and Public Outreach Program effectively communicates the excitement, discovery, and value of the ALMA mission, science, and technology to the broadest possible international audience.

A vision statement should be a vivid description of the imagined future, capturing what an organization aspires to become, achieve, and create. It should be clear and cogent, ambitious, inspiring, and enduring. The WG's draft vision statement for the ALMA EPO Program is below.

ALMA EPO VISION STATEMENT [DRAFT]

The ALMA Education and Public Outreach (EPO) Program engages and inspires the imaginations of professional and amateur astronomers, the worldwide public, students and teachers of all ages and nationalities, and the international media. The ALMA EPO Program will be a world leader in astronomical outreach and education.

A draft ALMA EPO Strategic Plan for the five-year period from 2008 through 2012 will be delivered to the ALMA Board for consideration and review at its June 2007 meeting. The ALMA EPO Strategic Plan will be updated at least every two years (TBR).

4. ALMA EPO Long Range Plan

In addition to an ALMA EPO Strategic Plan, the WG will craft an ALMA EPO Long Range Plan for the period 2008 through 2012. This Long Range Plan will describe the implementation plan for the adopted strategies.

Three ALMA EPO implementation options will be defined for consideration and review by the Executives, the JAO, and the ALMA Board. The WG terms these options as “visionary”, “intermediate”, and “minimal”.

The “visionary” option will define the programs and resource required to achieve the WG’s vision for ALMA EPO and most effectively communicate ALMA science, technology, and value to an international audience of millions. Implementation of this option will ensure a high public and media profile for ALMA science and technology. This option will also, of course, require the greatest investment of resources.

Each of the visionary option programs will be prioritized. Based on these priorities, the “intermediate” and “minimal” options will be constructed. The “minimal” option will be exactly that: a minimum ALMA EPO program set and investment. It will include only the highest priority program elements, such as online outreach and news. The “intermediate” option will define a programmatic and resource level that lies between the visionary and the minimal options. The recommendation of the ALMA EPO Working Group will be to implement the visionary option.

Each ALMA EPO program element will seek to lead its target audience to an improved understanding of science in general, astronomy in particular, and the Universe. Individual program elements will target a variety of audiences, but they will share resources and staff, whenever possible, to achieve maximum efficiency. Every effort will be made to ensure that exemplary professional practices, healthy innovation, and

the best ideas permeate the program. Cooperation and collaboration among and between the Executives and the JAO is critical to program success.

Each element of the ALMA EPO program will be designed to deliver innovative products and services to the widest possible audience. The ALMA EPO Working Group will, whenever possible and practical, partner with existing experts and centers of excellence, extending the program's reach. The ALMA EPO program will also design programs that focus on the underserved, underrepresented, those who have little or no access to technology such as the Internet, and populations with special learning needs.

Since ALMA is being built, operated, and maintained in Chile, an effective and significant EPO program within Chile is vital to ALMA's long-term success and to future international science projects. ALMA must be known and valued by the Chilean people, including teachers, students, media, and the government. An Executive-neutral program of Spanish-language ALMA education and outreach that is considerate of and responsive to the needs, interests, and culture of the Chilean people will be an ALMA EPO priority.

The skills required for a visionary ALMA EPO Program include:

- Web, multimedia, and database programming
- Image processing
- Astronomical visualization, simulation, and animation
- Video production
- Curriculum development and evaluation
- Graphics and illustration
- Science writing
- Grants administration
- Project management and administration
- Promotional Material

In addition to being inspiring and informative, ALMA EPO products and services must be scientifically accurate and current. The ALMA EPO program will require frequent access to PhD and MS-level astronomers who are actively involved in research and passionate about communicating the wonders of astronomy to non-scientists. It is assumed that EPO program participation by ALMA scientists will be actively encouraged and rewarded by ALMA senior managers and scientific leadership.

The ALMA EPO Program will strive to increase the involvement of scientists in education and public outreach and their effectiveness in sharing the excitement of astronomical research with the people who fund it. The ALMA EPO program will supply outreach materials that assist scientists in EPO activities, and will coach scientists in effective public communication skills.

An external advisory panel will be formed in 2008, with panel members drawn from the science, news, education, and outreach communities. The initial charge to this group will be to review and critique the ALMA EPO Strategic Plan and Long Range Plan. Thereafter, the ALMA EPO Advisory Group will be convened every TBD years to review the activities of the ALMA EPO Program and provide feedback on the program's goals and accomplishments. This panel will act as a guide, a resource, and a review committee whose input will be used to design new program elements as well as improve and refocus existing program elements.

A draft ALMA EPO Long Range Plan for the five-year period from 2008 through 2012 will be delivered to the ALMA Board for consideration and review at its October 2007 meeting. This ALMA EPO Long Range Plan will be updated at least every two years (TBR).

5. ALMA EPO Policies and Procedures

The complexities of the international ALMA collaboration require the consideration and creation of a set of appropriate ALMA EPO policies and procedures. These policies and procedures are intended to provide a framework for EPO collaboration and enable timely and effective communication between and among the Executives and the JAO, as well as timely and effective communication between the ALMA EPO program and its diverse international target audiences, including the media, educators and students, the professional and amateur astronomical communities, local communities, political and administrative decision-makers, and industry.

Policies and procedures are required, for example, to define the preparation and distribution of press and image releases. Though some ALMA press releases will only have regional (North American, East Asian, European, or Chilean) interest, the majority of ALMA press releases will be of international interest, requiring careful but rapid coordination among the Executives and the JAO. Policies and procedures are needed to readily establish which organization and/or position has the lead for which press releases, the required timelines, the steps for producing supporting images, graphics, and video, and the determination of the most effective news distribution paths. These policies and procedures will also establish clear ALMA standards for the use of logos, graphics, language conventions, credit lines, etc.

ALMA EPO policies and procedures will encourage the JAO and the Executives to maximize collaboration and cooperation, sharing information and expertise and avoiding duplication. While each of the Executives has primary responsibility for ALMA communication in its home region, it also has responsibility to keep all partners informed.

A draft ALMA EPO Policies and Procedures document will be delivered to the ALMA Board for consideration and review at its June 2007 meeting. The ALMA EPO Policies and Procedures will be reviewed at least annually (TBR).

6. ALMA EPO Inventory

Since the beginning of their involvement with the Project, each of the Executives has independently initiated a range of ALMA-related EPO program elements. These activities have resulted in the production of a wide range of outreach materials, including:

- online outreach content
- exhibits, presentations, and support materials for professional astronomical community meetings
- brochures for the public
- presentations for the public
- formal education materials
- informal education materials
- news releases and media fact sheets
- graphics and artist's concepts
- maps
- images
- videography
- animations
- science simulations etc.

A considerable investment has been made in these outreach products, and some number of them undoubtedly have future value, either alone or in combination with new materials. Thus, the ALMA EPO Working Group will conduct an inventory of these EPO materials, evaluate their potential for future use, and archive them, as appropriate.

This ALMA EPO Inventory will include at least the following for each item:

- title
- content description
- motivation(s)
- media
- format
- length
- production method(s)
- production date(s)
- producing organization(s) and individual(s)
- distribution
- availability
- required permission(s)
- required credit line(s)
- point(s)-of-contact for further information (name, organization, e-mail, phone)
- recommendation regarding future use, distribution, and expiration date.

This inventory will be produced in on-line and hardcopy formats and made available to the ALMA Board, Executives, JAO, and the funding agencies.

The initial ALMA EPO Inventory will be delivered to the ALMA Board for consideration and review at its June 2007 meeting. This inventory will be updated at least annually (TBR).

7. ALMA EPO Program Elements

This section discusses key ALMA EPO program elements. The EPO organizations of the Executives have already initiated work on several of these programs. Though each is important to the ALMA EPO vision, it remains to be determined to what extent these programs will be implemented by the JAO and the Executives. Implementation decisions will be based on the adopted ALMA EPO strategies and plans, the available resources, and each program's relative priority, which may vary among the Executives. The EPO program elements in this section are discussed in approximately decreasing priority order, though this ordering should not be too finely interpreted and may vary among the Executives, as well as between the Executives and the JAO. Performance metrics will be developed and periodically assessed for all ALMA EPO programs.

7.1 Online Outreach

The Internet is arguably ALMA's most important outreach venue, given the web's round-the-clock availability and ability to reach millions. Access to the Internet will certainly continue to improve around the world through the ALMA era, and many persons will likely first learn of ALMA via the World Wide Web.

Innovative use of the Internet, staying abreast of technology development, and aggressively employing emerging Internet-related technologies will be essential elements of an effective and far-reaching ALMA EPO program. While personal computers were once the primary means of accessing the Internet, devices such as PDAs and cell phones now routinely send and receive e-mail and access the Web. Web-based social networks offer opportunities to engage and inspire hard-to-reach audiences, such as young people. By the time ALMA becomes fully operational in 2012, custom web portals and portable devices for two-way, high data rate interaction with text, graphics, and video will likely be commonplace.

Through the Internet, ALMA observational data will be made broadly accessible to the public, teachers, students, and the media. The ALMA EPO program will craft the on-line tools, procedures, and tutorials that will enable anyone with a computer, a web browser, and an interest in astronomy to access and study ALMA images, data products, and educational materials. To assist in this work, the ALMA EPO program will seek to establish mutually beneficial partnerships with companies working at the cutting-edge of Internet technology.

Maintaining an effective and attractive ALMA EPO Internet presence requires a multi-person team with the skills to create, upload, manage, and update scientific and EPO content for the ALMA web sites operated and maintained by the JAO and the Executives. ALMA EPO web content will include basic project descriptions, press and image releases, media kits, educational materials and programs, images and illustrations, animations, streaming video, pod casts, web casts, presentations, and more.

Though the JAO and the Executives have established ALMA websites, each of these requires significant additional attention and resources to renovate and extend their current online ALMA outreach.

7.2 Astronomical Community Outreach

The JAO and Executives' EPO, scientific, and senior management staff play important roles in communicating ALMA's progress and vision to the professional astronomical community. The ALMA EPO Program will assist with this important communication task by designing and deploying informative ALMA exhibits at key international and Chilean science meetings, such as the International Astronomical Union (IAU) General Assembly and at the more frequent international ALMA science meetings such as the

“Science with ALMA: A New Era for Astrophysics” meeting held in Madrid, Spain in mid-November 2006.

The ALMA EPO program will also produce online and hardcopy format materials (brochures, DVDs, images, etc.) for distribution to the science community. The brochure produced for the 2006 Madrid meeting, e.g., was a collaborative product of the ALMA EPO Working Group and is on-line at http://www.cv.nrao.edu/naasc/alma_observers.shtml.

The Executives already provide some ALMA outreach to their regional astronomical communities. Thus, AUI/NRAO designs and staffs ALMA exhibits with a North American perspective at the semi-annual meetings of the American Astronomical Society; and ESO designs and staff ALMA exhibits with a European perspective at the annual Joint European and National Astronomy Meetings (JENAM) and similar European venues.

Once ALMA is fully operational, the ALMA EPO program will propose designing and implementing ALMA research opportunities for advanced amateur astronomers.

7.3 News & Image Releases

The generation and distribution of news and image releases to the international electronic and print news media is a critical element of the global ALMA EPO program. Prior to the initiation of Early Science in 2010, the news team is primarily responsible for tracking and publicizing key milestones in the progress of ALMA construction around the world. When Early Science commences, the news team also becomes responsible for uncovering and broadly publicizing ALMA’s exciting scientific discoveries.

This work will be accomplished through frequent news releases, televised and Internet-based press conferences, and press conferences at scientific meetings. It requires coordination with the international media, as well as establishing and maintaining a strong working relationship with major domestic and international news producers.

News release packages will include informational copy, images, illustrations, animations, video interviews, and supplemental background information elements. They will be distributed to news organizations worldwide, which will use them to build their own coverage and will often place them without modification directly into television broadcasts, print publication, and online services. In addition to being directly used by print, television, and online journalists, news products will cascade into numerous other EPO products. For each release, the news team will provide translation and distribution in Chile. Online ALMA media kits are a near-term priority.

Each of the Executives has a functional news team that will expand as the quantity of ALMA news releases increases. The ALMA project is expected to generate ~ 6 news releases in 2007. ALMA news production is estimated to increase to ~ 48 news and image releases in 2013, the first year of full science operations.

7.4 Millimeter/submillimeter Data Visualization

ALMA will provide a quantum leap in our ability to generate high quality, high-resolution images of astronomical objects in the millimeter and submillimeter wavelength regimes. The enormous value of breath-taking astronomical images for capturing the attention of the public and the media need hardly be stated.

Excellent images will be a major contributor to establishing and maintaining ALMA's public and media profile.

Thus the ALMA EPO program plans will invest in millimeter and submillimeter data visualization. The resources required to transform most science data into high-quality EPO image products is substantial, and is consistently under-estimated by the majority of astronomers. Every EPO organization has seen and been forced to work with images “that only a scientist could love.” At radio wavelengths, these include garish RGB radio data visualizations, boring contour plots, and complex spectra, none of which capture the public’s or media’s eye.

A few astronomers have invested time in studying how to convincingly marry art and science, producing outstanding and attractive astronomical data visualizations. The Hubble Heritage Project team (<http://heritage.stsci.edu>), e.g., has created compelling images of ~ 100 astronomical objects and had a dramatic positive impact on the public’s perception of science, astronomy, and the HST.

Significant work will be needed to effectively visualize millimeter/submillimeter interferometer data for EPO products, including methods to create effective composites with astronomical data acquired by telescopes operating outside the radio domain.

7.5 Publications

Online and print publications are a key element of any EPO program. Resources will be required to design, distribute, and periodically update online and hardcopy ALMA brochures for the professional astronomical community and the general public. The ALMA EPO program will also initiate an international, quarterly (TBR) ALMA Newsletter for the professional astronomical community.

Since the ALMA Observatory will always be inaccessible to the public and most astronomers, a comprehensive virtual tour will be designed and distributed via on-line and DVD media. Multiple versions will target different audiences. Since each of the Executives has undertaken a program of high definition video and still photography to document ALMA, the EPO program will have the raw material to create and distribute a range of high-quality video and images that can be incorporated in a wide range of EPO products, including a virtual tour.

Simulated and real ALMA images will provide the raw material for additional publications, such as an extensive on-line Image Gallery, posters, lithographs, annual calendars, and image releases on-line and via DVD.

All ALMA EPO publications will be translated into Spanish for distribution in Chile.

7.6 Formal Education

The ALMA EPO Formal Education program will employ science experts, education specialists, and multimedia experts to develop on-line and hard copy curriculum support products for use by K - 12 educators and students. These products will be crafted in accord with national educational standards and will be subjected to rigorous evaluation before and after their release. The ALMA Formal Education program will produce and distribute products such as astronomy lecture web casts, classroom-ready activities that discuss ALMA science and technology, and tools that enable the exploration of real and simulated ALMA data in classrooms. The Formal Education program will support the education communities by offering teacher professional development training and workshops.

7.7 Informal Education

The ALMA EPO Informal Education program will establish links with science centers, planetariums, natural history museums, observatory visitor centers, libraries and similar forums that are visited by public audiences seeking to broaden their understanding of science. The Informal Education program will provide ready-to-install multimedia products that describe ALMA science and technology for temporary or permanent use. This program will also provide raw materials from the ALMA EPO inventory to institutionally based program and exhibit developers. Target venues for the ALMA informal education products will include facilities such as the *Museo Interactivo Mirador* (see <http://www.mim.cl>), a major science museum in Santiago, Chile that sees ~ 500,000 visitors per year, including numerous school groups. The Informal Education program will organize, promote, and web cast a series of talks by astronomers working on ALMA. As the array begins doing science, these talks will feature ALMA's latest discoveries.

7.8 ALMA Visitors Center

A small ALMA Visitors Center accessible to tourists will be integrated with the Operations Support Facility in Chile. This visitors center will include exhibits describing the project's science and technology, and will require ~ 2 FTEs for its operation. This visitors center is expected to see ~ 10,000 visitors per year in 2013.

8. JAO ALMA EPO Program in 2007

The JAO ALMA EPO Program formally begins in spring 2007 when its first EPO staff person is hired. This JAO Public Relations (PR) position was defined and advertised in 2006. A large pool of candidates from Chile, Europe, and North America with a range of experience and education applied for the position. A selection committee that includes each of the Executive's representatives in Chile interviewed the most qualified candidates in February 2007. A second round of interviews will be conducted with the finalists in March 2007. A final decision regarding this JAO hire is expected in April 2007.

The highest priority JAO EPO task in 2007 will be the renovation and improvement of the international ALMA website. The JAO PR person will also be involved in ALMA news event and press release planning, will initiate a global ALMA Newsletter, and will become the ALMA EPO Working Group Chair.

The JAO will add other personnel to its PR office in 2007 and 2008 so that it can expand into Astronomical Community Outreach, as well as initiate Formal Education and Informal Education programs.