

## The Group Formerly Known as EPO

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As noted in the Project Manager's article, 2015 has been a year of transition for CXC EPO. The restructuring that began several years ago with the removal of the education portfolio from all missions in NASA's Science Mission Directorate (SMD) has now been fully implemented. The activities formerly known as EPO, which included everything from press to formal education activities, have been divided into two areas: Public Communications and Outreach, directed from the NASA Office of Communications (NOC), and the informal and formal education activities now funded under a new NASA Cooperative Agreement directed and administered from SMD.

Public relations and public outreach activities such as our press and image releases, public web site, social media activities, and any digital public information products (including PPT slides of all images for talks) will continue, as before, to be carried out by the CXC: the EPO group is now known as Public Communications and Outreach. This year the NOC initiated a series of thematic "campaigns", putting all SMD press and public outreach programs into one of them. *Chandra* (along with the other Astrophysics Division missions) is in the Solar System and Beyond campaign which highlighted such activities as the 20th anniversary of the discovery of Exoplanets and the New Horizon Fly-By, to both of which *Chandra* was able to contribute. The NOC is also responsible for organizing mission participation in large scale events, such as the Science & Engineering Festival held in Washington DC. The intent is to make SMD mission Public Communications and Public Outreach more cohesive and synergistic with broad NASA goals.

The Manager's article lists the 2015 statistics on press and image releases, number of resulting articles, number of feature images on HEASARC, APOD and NASA image pages, and number of podcasts and blogs. We target podcasts and blogs at several audiences, including segments of the public who prefer video or shorter presentations of our science results, younger children (Space Scoop and *Chandra* Sketches), audiences seeking career information (Meet an Astronomer, Women in the High Energy Universe) and audiences interested in the science topics presented in the Here, There & Everywhere (HTE) and Light: Beyond the Bulb (for

International Year of Light) public exhibits.

We continue to track very healthy web and social media statistics. Website hits consistently average above 12M per month, with spikes for releases that generate above average interest, for instance, the SgrA\* release at the January 2015 AAS meeting. Podcasts remain the top download from our public site. As of December, we had over 84K Twitter followers, over 255K FaceBook likes, over 34K followers on Google +, and over 1.5M YouTube views.

Conforming to directives from the NOC that no longer allow printing of posters, we transitioned thematic science material from our press and image releases, as well as topics from our public exhibits, to a new allowed format called "infographics". These are collected on-line at <http://chandra.si.edu/resources/illustrations/infographics.html>. In addition we have been able to reprint popular lithographs and some new versions of smaller image handouts, a new line of science-by-topic bookmarks, etc. All are available from our online request form for use with public outreach or education presentations, see <http://chandra.harvard.edu/edu/request.html>. Click on the "List of Materials" to see what is available at any time.

We have developed new areas of products involving the latest technologies in imaging for use both in public outreach and education. We have expertise in producing images in Ultra HD (4K JPG) format and are gradually adding popular images to the collection, see [http://chandra.harvard.edu/photo/4k\\_images.html](http://chandra.harvard.edu/photo/4k_images.html). We prepared hyperwall talks for the AAS meetings. A study of image processing using CasA was prepared and presented on the visualization wall at the Harvard Art Museum. We have posted the files and instructions for printing 3D models of the *Chandra* spacecraft and the CasA supernova remnant online and have developed other 3D resources for use with sight disabled audiences.

Education funding in SMD is now a separate line that is determined yearly in the NASA budget. An award through the Cooperative Agreement Notice (CAN) is now the only mechanism by which SMD missions can undertake education activities. A CAN released in 2015 solicited proposals for a 5-year funding opportunity. The CXC proposed as a Co-I on a proposal led by STScI, along with Co-I's from Sonoma State, JPL and IPAC. Our "Universe of Learning" (UOL) program was selected for funding (along with 26 other awardees). At the end of December we were

still in budget negotiations with NASA, but, breaking the timeline on this article, we are finally funded in April 2016! Our activities under the UOL award will continue many of our highly successful education programs, such as our public exhibits, our online activities with image processing and data analysis, our Braille and tactile materials for sight disabled, our 3D imaging and printing products, our collaborations with SAO's Science Education Division on MicroObservatory, PencilCode activities, and our work with the National Science Olympiad and the Christa Corrigan McAuliffe Challenger Center in Framingham MA. Although our ability to carry out education programs this past year was limited by both reduced funding and NASA restrictions, highlights of main accomplishments are described below.

We carried out two public exhibit programs. We completed the last year of a 4-year EPOESS award from NASA to tour the HTE public exhibit which places science concepts relevant to astrophysics in more familiar contexts (<http://hte.si.edu/>). This exhibit toured the US at one venue per month. In addition, the concept was adopted by the US State Department for use in its "American Spaces" exhibits to showcase US science and we continue to work with them on an exciting new project for 2016.

We also won funding from SPIE, the IAU and UNESCO to develop a public exhibit (Light:Beyond the Bulb/L:BTB) for the International Year of Light 2015. We used *Chandra* funding to produce a NASA version focused on space science results (Figure 1). The NASA L:BTB exhibit toured the US at one venue per month. SPIE funded several more. Figure 2 shows the 1-year reach of the HTE exhibit (top), and the L:BTB exhibits (bottom). The open source model enabled organizers worldwide to develop their own exhibits. We also developed Braille/tactile materials with each exhibit and for the US version, translated the content into Spanish. A briefing to Senators during a "Science Day on the Hill" resulted in an exhibition of L:BTB in the US Capitol Rotunda.

A pilot program developed with the Google-sponsored Pencil Code/Hour of Code (Figure 3), which introduced simple coding exercises leading to astronomical images was developed into a NASA approved activity. We gave several workshops to local schools and after and out-of-school programs working with girls and underserved schools: many more are scheduled.



Figure 1: Public exhibit (Light:Beyond the Bulb/L:BTB) for the International Year of Light 2015.

We continued supporting the middle and high school level astronomy competitions of the National Science Olympiad (NSO), a non-profit, volunteer-based program which reaches over 200,000 students each year nationwide. We developed the content for the 2016 competitions, and developed and taped a set of videos as resources for coaches and their student teams. Seventeen workshops were presented at NSO coaches clinics and at National Science Teacher Association meetings.

We collaborated on several activities with the Christa McAuliffe Challenger Center located on the campus of Framingham State University. The exhibit of *Chandra* images prepared for NASA HQ for the *Chandra* 15th anniversary and a copy of HTE remain there on loan. Programming for several classes was developed around these exhibits. A copy of the outdoor exhibit prepared for International Year of Astronomy was loaned for the inaugural Science on State Street festival.

We continue the Astronomy & Aesthetics program to develop best practices in presenting astronomy results to the public. Three papers on this topic were accepted and published in reviewed publications.

We encourage participation by the *Chandra* science community in all aspects of our Communications, Public Outreach and Education activities. We ask that you contact us with newsworthy science stories, ideas for web content, ideas for public outreach or for education activities or products, or to volunteer to present talks or to take part in any of our public activities. ■



Figure 2: 1-year reach of the HTE exhibit (top), and the L:BTB exhibits (bottom)



Figure 3: Pilot program developed with the Google-sponsored Pencil Code/Hour of Code, which introduced simple coding exercises leading to astronomical images