

Training Young Astronomers in EPO: An Update on the AAS Astronomy Ambassadors Program

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Abstract. The American Astronomical Society, with organizations active in EPO, has launched professional-development workshops and a community of practice to help improve early-career astronomers' ability to communicate effectively. Called "Astronomy Ambassadors," the program provides mentoring and training for participants, from advanced undergraduates to beginning faculty. By learning to implement effective EPO strategies, Ambassadors become better teachers, meeting presenters, and representatives of our science to the public and government. Because young astronomers are a more diverse group than those who now do most outreach, they help the astronomy community present a more multicultural and gender-balanced face to the public, enabling underserved groups to see themselves as scientists. Ambassadors are given a library of outreach activities and materials, including many developed by cooperating organizations such as the ASP, plus some that have been created by Andrew Fraknoi specifically for this program.

1. Introduction

The American Astronomical Society (AAS), in partnership with the Astronomical Society of the Pacific (ASP), members of the Center for Astronomy Education (CAE), and other organizations active in science education and public outreach (EPO), has launched a series of professional-development workshops and a Community of Practice designed to help improve early-career astronomers' ability to effectively communicate with students and the public. Called "Astronomy Ambassadors" (Gurton et al. 2013), the program provides mentoring and training experiences for young astronomers, from advanced undergraduates to new faculty; it also provides access to resources and a network of contacts within the astronomy EPO community.

By learning how to implement effective education and outreach strategies, participants in the Astronomy Ambassadors program will become better teachers, better presenters at meetings, and better representatives of our science to the public and to government. Because young astronomers are a more diverse group than those who currently do the majority of outreach, they will help the astronomical community present a multicultural and gender-balanced face to the public, enabling members of underserved groups to see themselves as scientists.

AAS astronomy ambassadors are provided with a large library of outreach activities and materials that are suitable for a range of venues and audiences, which will grow with time. We call it the “MOOSE,” or Menu of Outreach Opportunities for Science Education. Much of the MOOSE consists of resources developed by organizations such as the ASP, the Pacific Science Center, and the CAE for other outreach programs, though some resources have been created by lead author Andrew Fraknoi specifically for this program.

The first Astronomy Ambassadors workshop was held at the 221st meeting of the AAS in January 2013 and served 30 young astronomers chosen from more than 75 applicants. Feedback from workshop participants and lessons learned from the reports they submitted after conducting their own outreach events are informing planning for the second workshop to be held 4–5 January 2014 at the 223rd AAS meeting in Washington, D.C.



Figure 1. Dennis Schatz addresses the first class of Astronomy Ambassadors at the inaugural workshop held at the 221st AAS meeting in Long Beach, California, in January 2013. Photo by Rick Fienberg, © 2013 AAS.

2. Putting a Face on Science

The Astronomy Ambassadors project was the brainchild of past-AAS President Debra M. Elmegreen. Among other motivations, she was alarmed at the results of *Research!America's* 2011 “Your Congress—Your Health” poll, which revealed that more than 80% of U.S. citizens do not know a scientist personally and consequently feel little or no direct connection to the scientific enterprise. The AAS Council agreed with Elmegreen that we should take action to address this problem.



Figure 2. Suzy Gurton, Andrew Fraknoi, and Anna Hurst Schmitt (left to right) joined Dennis Schatz as trainers at the Long Beach workshop. Photo by Rick Fienberg, © 2013 AAS.

3. The First Class of AAS Astronomy Ambassadors

One of our goals is to put a young, enthusiastic, and diverse face on the science of astronomy. Accordingly, the primary candidates for Astronomy Ambassadors training are early-career AAS members, mainly graduate students and postdocs, but also including some advanced undergraduates and new faculty members.

We strive to include ambassadors of both genders, from a variety of cultural backgrounds, from institutions large and small, urban and rural, and to encourage ambassadors to seek out venues with diverse audiences for their outreach activities.

Table 1 lists the racial diversity, gender diversity, and career stage of the first class of AAS Astronomy Ambassadors.

Table 1. Diversity of the First Class of AAS Astronomy Ambassadors

Race	Number	Percentage
Caucasian	23	77%
Asian	5	17%
Hispanic/Latino	1	3%
African American	1	3%
Female	20	67%
Male	10	33%
Graduate Student	23	77%
New Faculty/Staff	5	17%
Postdoc	1	3%
Undergraduate Senior	1	3%

In the eight months immediately following the workshop, 21 of the ambassadors logged a combined 91 EPO events, while nine ambassadors had not yet held their first event. The four most active ambassadors have, between them, conducted 49 events, 54% of the total. Eleven more ambassadors have held at least two events, while six have organized one event apiece.



Figure 3. A scene from the first Astronomy Ambassadors workshop, at the 221st AAS meeting in Long Beach, California, in January 2013. Photo by Rick Fienberg, © 2013 AAS.

4. Whom Are Ambassadors Serving?

The opportunities for outreach are many, both in and out of the classroom. Adults and family groups flock to community centers, science museums, planetariums, nature centers, national and regional parks, fairs and festivals, science-institution open houses, etc., where they can be engaged in science, technology, engineering, and mathematics (STEM) activities. Students can be found not only in formal classrooms but also in after-school programs and summer camps. The tools emphasized in the workshop are most appropriate for the general public and middle- and high-school students.

Among the 91 outreach events logged by AAS Astronomy Ambassadors, 39% were school visits (23) or visits to after-school programs (13). Many of the other events were public lectures, planetarium programs, or public star parties. Audiences averaged about 120 in number (more than 10,000 people in all) and included everyone from preschoolers to senior citizens, with most events serving K–12 schoolchildren and their parents and teachers (Table 4).

Table 2. Audiences Served by AAS Astronomy Ambassadors, Jan.–Aug. 2013

Audience Type	Percentage of Events
Preschoolers	11%
Primary-school age	56%
Middle-school age	38%
High-school age	33%
College age/young adults	33%
Adults	47%
Seniors	27%

5. A Community of Practice

Using infrastructure already developed for the ASP’s Astronomy from the Ground Up (AFGU) program, we have built a forum dedicated to tools for, and communication among, AAS Astronomy Ambassadors. Participants are part of an online community that regularly exchanges ideas, resources, and experiences, not only with each other but also with their workshop trainers.

As the program grows—as new cohorts of ambassadors “graduate” from training and get involved with outreach—there will be an increasing number of participants in the online forum, more sharing of successes and challenges, and greater opportunities for group problem solving. Eventually we expect to move the forum to the AAS website, where we will be able to take advantage of the AAS’s new communications infrastructure.

6. Second Workshop at the 223rd AAS Meeting in January 2014

The AAS Astronomy Ambassadors workshop content balances skill building with a deeper understanding of outreach. It offers general tips for finding existing programs and materials for astronomy and science outreach and helps participants learn how to

identify specific opportunities in their own communities. Workshop sessions also assist young scientists in gaining a better understanding of how people learn and what makes outreach to nonscientists effective. By building on participants' existing communication skills and natural enthusiasm for science, workshop activities build confidence in the participants for doing public outreach.

Our second Astronomy Ambassadors workshop was offered on 4–5 January 2014 during the weekend preceding the 223rd AAS meeting in Washington, D.C. The AAS provided participants with modest travel stipends to help defray the cost of coming to Washington D.C. two days early to attend the workshop. We hope to be able to offer workshops at future AAS meetings as well.

7. Evaluation

In addition to the event logs on which astronomy ambassadors report their outreach activities, we conducted pre- and post-workshop surveys, observations of the workshop, lunchtime focus groups with participants, and post-workshop telephone interviews with a subset of participants, all as part of a formative evaluation plan. These efforts are helping to refine our planning for future workshops.

Results from the post-workshop survey are encouraging. More than 90% of respondents rated the inaugural workshop as good or excellent. Most also thought that the content of the workshop was just what they were hoping for, except that they would have liked to have had more time devoted to learning about various questioning strategies, to discussing fears and obstacles in carrying out outreach events, and to identifying sources of funding and other types of support for their outreach efforts. Participants with less prior experience in EPO found the workshop most valuable, so we will welcome participants with less outreach experience in the future.

8. How to Get Involved

If you are part of our target audience and would like to become an astronomy ambassador, watch the announcements from the AAS for future January workshops—they will contain instructions for applying to attend the workshop.

If you are an experienced EPO professional and are interested in contributing outreach materials or techniques that you have developed and that could be featured on the Astronomy Ambassadors website and/or in our workshops, contact Suzanne Gurton, ASP Education Manager.¹ For general inquiries about Astronomy Ambassadors, contact Rick Fienberg² or Gina Brissenden.³

More information about the AAS Astronomy Ambassadors program is available on the AAS website.⁴ Additional resources relevant to astronomy education and outreach are available at the following websites:

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⁴<http://aaas.org/outreach/aaas-astronomy-ambassadors-program>



Figure 4. The AAS Astronomy Ambassadors workshop is highly interactive, with participants trying out a variety of approaches to science education and outreach and getting immediate feedback from their peers. Photo by Rick Fienberg, © 2013 AAS.

<http://www.pacificsciencecenter.org/Portal-to-the-Public/portal>
<http://www.astrosociety.org/education/programs.html>
<http://astronomy101.jpl.nasa.gov>
<http://science.nasa.gov/researchers/education-public-outreach/>
<http://www.afterschoolalliance.org/>
<http://www.nsf.gov/news/classroom/education.jsp>
<https://wwtambassadors.org/wwt/>
<http://www.spsnational.org/programs/socks/>
<http://www.noao.edu/education/>

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References

- Gurton, S., Fienberg, R. T., Fraknoi, A., & Prather, E. E. 2013, "Introducing the AAS Astronomy Ambassadors Program," in *Communicating Science*, J. Barnes, C. Shupla, J. G. Manning, & M. G. Gibbs, eds., ASP Conf. Ser. 473, 351