

Amateur Astronomers as Informal Science Ambassadors: Results of an Online Survey



Astronomical Society of the Pacific

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EXECUTIVE SUMMARY

INTRODUCTION

In order to gauge amateur astronomers' potential role and significance as informal science educators, the Astronomical Society of the Pacific (ASP), in collaboration with the Astronomical League (AL) and the Institute for Learning Innovation (Institute), initiated a large-scale, web-based survey of amateur astronomers' current education and public outreach practice (educational outreach) and their perceived needs for conducting more and/or improved educational outreach. The effort also gathered feedback about a list of potential products and/or services that might assist amateur astronomers in providing additional and higher quality educational outreach.

Specifically, the survey collected the following information:

1. Amateur astronomers' participation in current educational outreach along with their level of engagement, affiliation and membership in amateur astronomy clubs or societies, interests within astronomy, reason for doing outreach, etc.);
2. Target audiences served by amateur astronomers engaged in educational outreach;
3. Topics presented by amateur astronomers;
4. Use of media and other resources/equipment for this educational outreach;
5. Partnerships that amateur astronomers engage in for the purpose of educational outreach;
6. The way amateur astronomers organize their educational outreach efforts;
7. Current educational outreach demand not fulfilled by amateur astronomers;
8. Perceived main barriers to providing high quality outreach;
9. Potential products and/or services that would assist amateur astronomers in doing more and higher quality educational outreach;

In addition, amateur astronomers not currently engaged in educational outreach were asked:

1. Why they do not engage in educational outreach currently;
2. Whether and under what circumstances they would engage in such outreach;
3. Resources and other support they need to engage in educational outreach;
4. Target audiences they would like to serve, and topics they would like to cover in future educational outreach efforts.

The sample included amateur astronomers who, as members of amateur astronomy clubs/societies or on their own initiative, already engaged in some outreach, including making class visits to schools and talks to local youth or community organizations, as well as sponsoring star parties and participating in local festivals. In addition, the sample included amateur astronomers who, though not engaged in education or public outreach activities at the time of the survey, were contemplating or interested in doing such outreach.

This study is one of the most comprehensive thus far attempting to document the role and significance of a specific, highly engaged and interested group of citizen scientists who provide educational experiences to a large segment of society about a specific science topic. The results of this study will inform the field of science education about the general role that amateur science educators play in supporting free-choice and formal science learning, as well as the specific role that amateur astronomers play in supporting astronomy education for the public.

METHODS

In close collaboration with ASP staff, Institute researchers developed a list of potential questions and pilot-tested them in semi-structured telephone interviews with a random sample of 15 active amateur astronomers whose contact information was derived from publicly accessible sources (websites). Based on the feedback received from this group, ASP staff and Institute researchers refined the survey questionnaire. The completed questionnaire was modified into a web-based survey, hosted on the Institute server. ASP and AL provided a link to the Institute web survey site and amateur astronomers who visited the ASP and AL websites were encouraged to complete the survey.

The survey was advertised in mid-January on the ASP, and ASP-associated websites, the AL website, as well as on the website of *Sky & Telescope* and *Reflector*. The survey was further promoted through postings on various Listserves known to be highly frequented by amateur astronomers. In addition, a letter to the editor in the February edition of *Sky & Telescope* and notes in *Mercury* announced the survey and the survey was further mentioned in *Reflector*. The survey was also promoted through email announcements to ASP and AL members. The survey was open between mid-January and late March.

Since the survey was solely administered on the web, we have no knowledge of the response rate or any bias that may be inherent in such a self-selected sample. However, since the vast majority of amateur astronomers are believed to have Internet access, and since the majority of products that might derive as a result of feedback from this project would be distributed primarily over ASP's website, we believe that the sample is a representative sample of amateur astronomers who are likely to engage in education and public outreach efforts.

RESULTS

One thousand, one hundred and forty-two (1,142) amateur astronomers participated in the survey. Of those, 63% (n=717) were engaged in educational outreach, and 37% (n=425) were not. Findings from the survey indicated that amateur astronomers reach a large segment of society with their educational outreach efforts, cover a wide range of astronomy topics (though

“traditional astronomy” is still favored) and use a broad array of resources to conduct their educational outreach. They also generally believe that additional resources and support would be helpful and likely lead to increased levels of educational outreach activity and quality. Furthermore, research findings demonstrate that amateur astronomers are a highly committed group, willing to serve society as informal science educators; many of them consider educational outreach an important part of their “spare-time” activities.

More than any other form of support, amateur astronomers reported a need for improved access to materials and resources in order to aid their outreach efforts. Specifically, responses suggest that ASP will need to be sensitive to the varying ways in which amateur astronomers utilize materials: most amateur astronomers want materials and resources that are flexible and adaptable to a variety of situations. Interestingly, the need for support in terms of understanding and reaching audiences also continually emerged from the survey analysis. In some cases, the theme emerged in the form of a need for “public relations support,” or responding amateur astronomers simply mentioned difficulties in reaching the audiences they are interested in serving.

Amateur astronomers also felt that they would benefit from being better connected with one another and with other experts, feeling that an organization like the ASP could play a major role in facilitating these connections. They also suggested a number of areas in which they could benefit from further training.

Almost half of the amateur astronomers who answered that they were not engaged in educational outreach at the time of the survey were planning to do so in the future, and many more would consider educational outreach under the right circumstances, particularly if there were a variety of resource types and supports to assist them in their efforts.

RECOMMENDATIONS

The following four general findings emerged from the specific comments made by amateur astronomers. Based on the results of the survey, recommendations for the types and format of resources likely to support amateur astronomers in their current and future educational outreach efforts emerged.

Finding #1: *Amateur astronomers need access to material and resource support in formats that fit their specific needs.*

More than any other form of support, amateur astronomers reported a need for improved access to materials and resources to enhance their outreach efforts. However, they want materials and resources that are flexible and adaptable to a variety of situations. Three specific recommendations emerged from the analysis:

- a. Develop inexpensive props, curricula, handouts and posters or develop a portal that refers amateur astronomers to such material available elsewhere (e.g., NASA, JPL, etc.)
- b. Develop a set of brief video clips of animations that explain the basic celestial motions, solar system, seasons and so on. Ideally amateur astronomers would be able to preview lower-resolution versions of video clips/animation online and choose their own package from the available resources (download larger clips in various formats like Quicktime or

MPEG, or order custom-made video-tapes, CD-ROMS, or DVDs). As with the still images, scripts and explanations should be supplied.

- c. Provide a slide chooser website, where people can pick and choose individual slides in a searchable data base that contains lower-resolution thumbnail images of all available images. The slides can be connected to text/explanation and a suggestion for a short presentation, including a referral for other, similar, and complementary/supplementary slides. The images could be made available for download (for instance by clicking on the thumbnail images), emailed to free subscribers as jpg-files (with or without text), or ASP might offer to print the slides and mail them at a fair and reasonable cost (fee should remain below \$2 per slide).

Finding #2: Amateur astronomers need assistance and training in how to identify, reach, and understand the needs of their current and potential audiences.

The need for support in identifying, reaching, and understanding current and potential audiences continually emerged from the analysis. In some cases, the theme emerged in the form of “PR support,” or amateur astronomers simply mentioned a difficulty in reaching the audiences they wish to serve. The following recommendations emerged:

- a. Create a website that could function as a clearinghouse between schools/colleges and amateur astronomers who are willing to do in-class or field trip education in/for the formal sector.
- b. Develop a primer for amateur astronomers about how to engage in educational outreach activities. This primer could include information about why, who, and how to target audiences, what the public wants, comprehension levels, tips from experienced and seasoned amateurs and professionals, marketing, public relations, organizational tips for your club about engaging in outreach, etc.
- c. Develop a series of brief workshops that address presentation skills. These workshops could potentially focus on the following themes: (1) publicity/marketing/public relations, (2) how to address schools and school system needs, (3) targeting audiences, and (4) organizing your club or your public outreach event

Finding #3: Amateur astronomers are very interested in being networked to one another and to experts.

Findings suggested that amateur astronomers perceive they would benefit from being better connected with one another and with other experts. A variety of specific ways in which ASP could facilitate the development of beneficial informal relationships among and between amateur astronomers and professionals emerged from these data:

- a. Create an expert referral system (local professional astronomers and/or astronomy educators could join a system that allows amateur astronomers to ask questions and refers them to the appropriate expert on a case-by-case basis that would need to be determined. In order to minimize abuse, a free registration/sign-in system would be required.
- b. Create an Internet portal for amateur astronomers who are involved in educational outreach or would like to be. The portal could offer ASP’s resources, but also provide discussion rooms, referrals (for example: Who near Baltimore has a video projector I could borrow for a presentation at the local scout meeting? Can anybody lend me a

meteorite specimen for two days?), exchange of ideas, curricula, scripts, or props; posting presentation scripts, PowerPoint presentations, and software

Finding #4: *Amateur astronomers would like to strengthen their presentation and technical skills.*

Amateur astronomers self defined a number of areas within public astronomy outreach in which they could use additional training. One potentially effective mechanism for offering such support could be a series of local or regional workshops. The workshops could be short (2 hours), added to existing conferences, or be stand-alone half or full day events. They could potentially also be franchised to state astronomy associations. These specific recommendations emerged:

- a. Develop a series of brief workshops that address the presentation skills required for public outreach, including teaching pedagogy and public speaking, rhetoric, and so on.
- b. Develop a series of brief workshops that address technical skills, including: (1) how to develop and write handouts, (2) how to address curricular needs of teachers, after-school programs, etc. and, (3) how to make effective PowerPoint presentations.