

Astronomy Behind the Headlines at the Astronomical Society of the Pacific

James G. Manning

Astronomical Society of the Pacific
E-mail: jmanning@astrosociety.org

Michael G. Gibbs

Astronomical Society of the Pacific
E-mail: mgibbs@astrosociety.org

Suzanne Gurton

Astronomical Society of the Pacific
E-mail: sgurton@astrosociety.org

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Summary

The Astronomical Society of the Pacific, as part of its mission to advance science literacy through engagement in astronomy, is starting a new online programme using podcasting and other web-based techniques to provide astronomy background to educational “intermediaries” — those who are the interface between astronomy and the public. This programme, entitled Astronomy Behind the Headlines, is designed to assist these intermediaries in quickly responding to and interpreting the latest astronomy and space science news.

Introduction

The science of astronomy — in addition to its innate appeal to the psyche and all the pretty pictures — has, arguably, two important claims to fame in the pantheon of sciences: that it is the oldest, and that it changes faster than any other. Just look at how quickly astronomy textbooks become out of date.

From the time of Galileo’s discovery that much of the movable furniture of the heavens was in fact a set of other worlds, to today’s heated argument among his professional descendants about what should be called a planet and what shouldn’t, astronomy has been a no-holds-barred race to stay current with the latest discoveries and the ever-changing understanding of just what the cosmos is really like. With news of the latest comet whizzing past Earth and the newest extrasolar planet whizzing around another star, reports of the most recent exploits of *Hubble*, *Cassini*, the Martian rovers and other space missions, and the endless theoretical wrinkles put forth about how galaxies form, whether there’s life elsewhere, what happens in a black hole, how we char-

acterise dark matter and dark energy, and just how fast the Universal expansion is accelerating and what it means — how can anyone keep up?

If it is hard enough for those of us who dabble in this stuff for a living, where does that leave the public, and those charged with explaining it to them after the 30-second news-bite appears on the local news channel?

This is just the sort of challenge that we at the Astronomical Society of the Pacific (ASP) like to take on. And we are taking on a bit of it in a new grant-funded project designed to use podcasting and supporting web-based methods to provide background on the hot astronomy topics of the day for the educators who need to interpret the latest astronomical headlines for their public audiences.

The Rationale

It’s about leverage, when you come right down to it. Since 1889, when the ASP was founded by a group of professional and amateur astronomers in San Francisco, Califor-

nia, it has been adding to the problem (described above) by adding its voice to those disseminating astronomical information. Our mission, recently rearticulated, is to increase public understanding and appreciation of astronomy through scientists, educators, enthusiasts and the public as a vehicle for science literacy and exchange. We publish a peer-reviewed journal, volumes of professional conference proceedings, a newsletter for classroom teachers, and a popular-level magazine for members. We hold a professional educational and public outreach conference of our own as part of our annual meeting. We conduct professional development opportunities for teachers, develop educational materials, and manage formal and informal education networks of national scope in the US, assisting formal and informal educators and amateur astronomers in doing good astronomy and science education and outreach. And we are international in scope, with members in more than 40 countries supporting the work we do.

We recognise that we cannot do it all, or reach everyone, through direct efforts, and so in recent years we have focused our



Figure 1. Participants at the Tucson Astronomy from the Ground Up workshop carefully follow the directions to create a scale model of the volumes of the planets, starting with three pounds of play dough. Credit: Kemper Barkhurst.

educational resolve more on serving what we call astronomy “intermediaries” — the classroom teachers, museum educators, planetarium staffers, amateur astronomers, after-school programme directors, and others who work at the interface between the astronomy (and astronomy researchers) and the public. By helping them to build their capacity to use and teach astronomy and related science concepts for their target audiences effectively, we can leverage our resources to reach out to many more people, in effect, than if we were out there working with one classroom or field trip group or museum audience at a time.

In addition, we have found it easier to leverage these intermediaries if we can find ways to link them together in efficiently managed learning communities. And we find that a good way to do that is to establish physical and electronic networks and partnerships with the help of our friends.

One of the results is a National Science Foundation-funded programme called Astronomy from the Ground Up (AFGU), which provides capacity-building and professional development opportunities for informal educators at small and medium-sized science and nature centres who are interested in bringing more astronomy to their audiences. This programme is accomplished in collaboration with the National Optical Astronomy Observatory (NOAO) which provides the science muscle, the Association of Science-Technology Centers (ASTC) which creates an online environment for distance learning via ASTC Connect, and the Institute for Learning Innovation (ILI) which provides

evaluation and assessment expertise as we craft the programme to meet participant needs and learn what works best.

AFGU draws informal science educators into the joys of astronomy by conducting both on-site and online workshops, providing “toolkits” of activities covering three fundamental astronomical themes (size and distance, patterns and cycles, light and colour), and nurturing an online “community of practice” to encourage continued sharing, learning and support among workshop alumni as they apply their new knowledge and skills in their own programmes.

One important technique to encourage continued growth in astronomy education expertise is to demonstrate to participants that we are learning new things about the Universe all the time; all you have to do is watch the news or pick up a newspaper or magazine or surf the internet. As a consequence we emphasise interpretation of current astronomical events and discoveries in the AFGU programme. And the question we began to ask ourselves was whether there was a way that we could provide more specific preparation for these intermediaries in the dizzying world of hot topics and breaking astronomy news; if we could arm our intermediaries with more effective tools for sallying forth with confidence at the next new astronomical event, discovery, or controversy.

To answer this question, we went looking for another partner, and we found one in NASA’s Initiative to Develop Education through Astronomy and Space science grant programme, administered by the Space Tel-

lescope Science Institute and more mercifully known as the IDEAS programme. And we went with a single word knocking around in our brains: podcasting.

If there’s anything STEM-related that changes faster than astronomy, it’s technology, and it’s hard to imagine today that podcasting was a nonexistent term until 2004, when Apple introduced the iPod and a new way to communicate captured people’s imaginations. Today, it’s a form of communication used in clever ways by both children and adults, as described by Gay (2006). According to a report by Rainie (2005) for the Pew Internet and American Life Project, more than 22 million American adults own iPods or MP3 players and more than six million adults have listened to podcasts. And these podcasters are discriminating when it comes to astronomy. In a survey of *Astronomy Cast* listeners by Gay (2007), a weekly 30-minute podcast “that takes its listeners on a facts-based journey through the Cosmos”, the survey found that listeners “desire focused, image-rich, fact-based content that includes news, interviews with researchers and observing tips”.

We also found that while there were several astronomy-related podcasts available to consumers, the targeted audience tended to be the general public rather than, say, informal educators of the sort that we were trying to reach through programmes such as AFGU. Were we looking at a niche here that we could help to fill, while at the same time providing a new tool for us to use with our networks in bolstering educators? Educators are often without the training or resources to address new announcements or discoveries thoroughly, with little time or money for professional development, but toil on the front lines nonetheless, needing to communicate astronomy and answer public questions. Could we match the need with the technology in an effective way?

Building on these nascent thoughts, we approached the IDEAS grant programme with a proposal for Astronomy Behind the Headlines.

The Project

Astronomy Behind the Headlines builds on the online community that we have already established through AFGU, as well as initial results derived from working with distance learning methodologies. The core of the two-year project is to create a series of ten podcasts for informal educators on particular topics likely to be producing many of the headlines they will see — topics including sky events (eclipses, new comets, meteor showers, etc.), Solar System exploration, extrasolar planet discoveries, black holes, galaxy formation and evolution (and will the



Figure 2. Participants use squares of colour to create a temperature map of the inverted cookie sheet. To create differences, a heat pack and tray of ice are hidden below. Credit: Anna Hurst.

Andromeda Galaxy really hit us in several billion years?), dark matter, dark energy, cosmological questions, and the like. With the assistance of Dr Dana Backman, an infrared astronomer at the SETI Institute who runs the SOFIA education and public outreach programme for USRA and NASA, ASP staff will identify scientists and educators who are making the news, recruit them to participate in developing podcast scripts aimed at getting behind the snappy headlines to the real science and record their insights.

These podcasts will be posted on an interactive website — but the project hardly stops there. The recorded pieces will serve as the centrepieces of professional development modules that will focus on the specified topics and incorporate elements of the AFGU programme that we have found to be effective with our informal educator participants. After each podcast episode has been available online for two weeks, the ASTC Connect website will host an interactive online session on the topic in question — a forum stretching over 10–14 days with scheduled and moderated discussions with Dr Backman, ASP education staff, and the guest scientists featured on the podcasts. These follow-up sessions will include live interactive chats, often with live video and slide presentations, to provide visual content, demonstrate hands-on activities and other means of interpreting the given topic — all to allow for the exploration of topics in greater depth and to provide additional resources and techniques for interpreting these topics for wider audiences.

These events will be accessible through the interactive website, which will include, in addition to the podcasts, supplementary resources relating to the topics and an archive of existing podcasts and related materials for reference when the big headlines hit. No strings — except that participants will need

to participate in the evaluation of the effort by responding to short surveys and engaging in other means of determining how (and how many) participants are benefiting from the experience and if/how it has changed their education or outreach efforts in some tangible way. This assessment will be compared against the front-end assessment we will have conducted to survey the primary target audience about how to structure the project and products in the ways that best meet their needs and schedules and can most effectively engage a population of busy educators.

We expect that an immediate audience for the programme will be the expanding community of practice and workshop alumni from the AFGU programme. But since *Astronomy Behind the Headlines* is a programme inde-

pendent of, if complementary to, the AFGU, we see it as a new way to engage informal educators as well and to swell that supportive community of practice as each programme recruits participants to the other.

Given the specialised nature of the podcasting project in comparison to those targeted at the general public, we expect initial educator audiences to be relatively small — perhaps 500 and growing. But that's where multiplication enters the equation. As educators use the information and tools they receive to interpret hot topics to their audiences, the numbers of members of the public served in the process can grow to hundreds of thousands per year. Remember, it's all about leverage, about finding those amplifiers that can take your effort to places that you can't always reach — there being only so many hours in a day and only so many resources to apply.

The Future

IDEAS-funded projects are designed to be start-up projects — efforts for which seed money is provided with an accompanying expectation that the programme will have legs beyond the initial funding period. The ASP has a history of sustaining the efforts and networks it starts, and our plan is for *Astronomy Behind the Headlines* to be incorporated into our longer-term plans to serve networks of astronomy intermediaries.

We are therefore very interested in what our evaluation will tell us — whether there is a measurable beneficial effect of the programme on the target audience. Through short follow-up surveys with participants, a



Figure 3. AFGU partners include NOAO and part of their Hands on Optics toolkit. Here, participants test the resolution of their newly assembled telescopes. Credit: Paul "Pablo" Nelson.

more extensive online survey, the gathering of demographics and analysis of compiled statistics, we want to understand how best to implement the programme consistently and effectively, whether we're reaching the target population and how best to do it, and what refinements may be needed to achieve our goals. And most importantly, were there positive changes in the target audience in the interpretation and communication of headline astronomy for their own audiences, and can these changes be attributed to the project?

As the project proceeds, cool astronomy happens, and we assess the results, we will report those results in print and online publications and at professional meetings to share what we have learned.

Conclusion

Among the sciences, astronomy is a natural headline-grabber, as it has been since ancient kings nudged their court astrologers, hoping for favourable interpretations in the antics of the moving lights of the sky as their gods tossed the dice. Galileo grabbed more headlines when he made other worlds of those moving lights, and the press has been attentive ever since.

So is the public, and when their interest is piqued, whom do they call? They call the museum, the planetarium, the local astronomy club, a teacher, or others who they think can give them the details behind the pretty picture, the grabby headline, the 30-second sound bite on the evening news. *What is it? Where do I look? What does it mean?*

With Astronomy Behind the Headlines, we hope to equip some of those astronomy intermediaries with the answers, background, and tools to help them make the ever-changing cosmos a little clearer to their audiences. And in the process, perhaps a little more science literate than they were before.

It's a good and necessary thing. We'll let you know how it goes!

For more information on the Astronomical Society of the Pacific and its programmes, visit the ASP online at www.astro.society.org.

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Biographies

James G. Manning is the Executive Director of the Astronomical Society of the Pacific, a member of the US Program Committee for the International Year of Astronomy 2009. He chairs the global Cornerstone Task Group for the Galileo Teacher Training Program and is the Principal Investigator for the National Science Foundation grant Astronomy from the Ground Up.

Michael G. Gibbs, is the Chief Advancement Officer for the Astronomical Society of the Pacific and a member of the US Development Committee for the International Year of Astronomy 2009.

Suzanne Gurton is the Education Manager for the Astronomical Society of the Pacific and is responsible for developing family astronomy sessions and overseeing a variety of professional development programmes.



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