



## 2013 January/February AAS Newsletter

31 January, 2013

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### President's Column

David J. Helfand  
Quest University Canada

As I noted in my opening remarks at the 221<sup>st</sup> meeting of the Society in Long Beach, the state of the AAS — unlike that of the nation — is strong. We ended the year with a small positive balance in the Society's account for the fourth year in a row. Our collection of journals — the highest impact journals in the world in our field — is in even stronger financial shape. Our semi-annual conferences exceed expected attendance levels every time we meet, and we are exploiting the Executive Office's outstanding meeting organization resources to support more of our Division Meetings and to launch the Topical Conference Series with three smaller, focused meetings this summer. We will have an expanded public policy presence with the recruitment of Joel Parriott to the full-time role of Director of Public Policy, and our education and public outreach activities continue to grow in size and impact.

This enviable position of strength affords us the opportunity to examine many of the things we do for our members to see if we can do them even better. It also allows us to work on some of the issues in our discipline where we face notable challenges in the research funding trajectory, in facilities access, and with employment/demographic issues. In the months ahead, you will see initiatives in several of these areas. The Employment Committee, chaired by Kelle Cruz, has a new Strategic Plan which promises future benefits for our members. As another example, many of you who publish in our journals will receive shortly a survey designed to gather input for the upcoming AAS Journals Workshop in April. Please respond! As we step into a future of open access claims, purely digital publishing, grant funding challenges, and a rapidly changing global landscape, it is important that we have a broad cross-section of views when charting our journals' future. And our efforts to educate Congress on the importance of our nation's research investment will remain at the top of the agenda.

Those of you who attended the Public Policy session on Wednesday evening in Long Beach may well have a heightened appreciation of the importance of such education efforts. We were pleased to welcome two members of the California delegation, Representatives Judy Chu and Dana Rohrbacher, to spend time with our members. Rep. Chu's district includes Pasadena (meaning Caltech and part of JPL), while Rep. Rohrbacher is Vice Chair of the Committee on Science, Space, and Technology in the House. The exchange of views with the audience was, diplomatically speaking, lively. One of the ancillary issues raised by Rep. Rohrbacher was climate change. In fact, at its meeting a few days earlier, the Council had voted to endorse the American Geophysical Union's Statement on this subject which, again, put

diplomatically, is somewhat at odds with the Congressman's views. I provide here the rationale that led to this Council action.

In 2004, the AAS Council endorsed the American Geophysical Union's position statement on Climate Change (<http://aas.org/governance/resolutions.php#climate> [<http://aas.org/governance/resolutions.php#climate>] ). This endorsement was not without controversy; a significant number of AAS members felt this subject was not wholly within our field of expertise, and thus we had no place as a Society speaking publicly on the matter. A few members even threatened to resign in protest. The following year, the Society issued a statement supporting the teaching of evolution and the removal of "intelligent design" from the nation's classrooms; arguably, this issue is even further from our field of expertise, but fewer objections were raised (<http://aas.org/about/governance/council-resolutions#teach> [<http://aas.org/about/governance/council-resolutions#teach>] ).

Since their initial statement in December 2003, the AGU has twice updated and re-issued their Climate statement, most recently in February 2012, based on the 2007 IPCC report and subsequent developments; a copy of the current version can be found here: [http://www.agu.org/sci\\_pol/pdf/position\\_statements/AGU\\_Climate\\_Statement.pdf](http://www.agu.org/sci_pol/pdf/position_statements/AGU_Climate_Statement.pdf) [%20[http://www.agu.org/sci\\_pol/pdf/position\\_statements/AGU\\_Climate\\_Statement.pdf](http://www.agu.org/sci_pol/pdf/position_statements/AGU_Climate_Statement.pdf)] It was my strong belief that the time had come for us to re-affirm our Society's support for a scientific approach to the issue of global climate change.

Nearly 30 years ago, I became fascinated with paleoclimatology while doing research for a course I have offered at Columbia entitled "The Universal Timekeeper: Reconstructing History Atom by Atom" which explores the use of stable and radioactive isotopes to understand everything from art forgeries and archeology to the history of human diet and paleoclimate, as well as the obvious astronomical applications (age and formation of the solar system, stellar and galactic evolution, etc.). I have read a significant amount of the primary and secondary literature on the subject of climate change ever since, and have discussed it extensively with my Earth Science colleagues at Columbia. I have also given many lectures on the subject, both in classes and to the general public.

Despite not being a "climate scientist," I do not feel like a fraud. First of all, there are a number of aspects of this complex, multi-disciplinary problem that fall squarely within the realm of astronomy: solar variations, precession of the equinoxes, obliquity cycles and the changing ellipticity of the Earth's orbit. Second, much of the relevant physics is a part of the graduate education of most astronomers: radiative transfer, fluid dynamics, numerical modeling, etc. Most importantly, however, our fundamental approach to interacting with the world — collecting reproducible (often large) datasets using state-of-the-art detectors, employing sound statistical analysis, reconstructing unreachably remote (for us in space, for geologists in time) phenomena — and our approach to understanding the world through models based on the physics involved, are highly congruent with the modus operandi of earth scientists. (Even our sociology is similar — after some experimentation among the science departments at Columbia, it was clear that the astronomers and the geologists threw the best parties.)

We live in a media environment where pseudo-science and science get equal time (when science is lucky). The lack of basic quantitative reasoning skills among politicians, journalists, and the general public — and the deep anti-science undertone of much of our culture — are, in my view, a serious threat to our

civilization. It is thus incumbent upon us to speak out in defense of science. We (at least most of us) are not economists, sociologists, or politicians, so while we may well have our individual views on what actions should be taken in response to the changing climate, it is not our role as a professional society to pontificate on such matters. But the AGU statement is carefully circumscribed — it sticks to the science and recognizes the uncertainties. In my view, it would be an abdication of our responsibility to the public that funds us and (all too occasionally) looks to us for expert advice if we declined to take a stance on this crucially important issue.

The text of our resolution appears elsewhere in this *Newsletter*. Last year, the Sustainability Committee put together an excellent session at the AAS meeting on teaching — and talking about — climate change. I hope that more such sessions will appear at upcoming meetings.

In closing, I will note one other remark from my opening address in Long Beach which highlights the only area in which our Society is doing worse than the nation: voter apathy. We have an excellent slate of candidates for AAS officers and councilors for 2013 who have agreed to lend their time and energy to the support of the Society and our profession. Please expend five minutes of your time and energy today and vote before the deadline of 31 January. Thank you.

With best wishes to all for a productive and enjoyable new year,

David

## **From the Executive Office**

Kevin B. Marvel  
Executive Officer  
American Astronomical Society

The Long Beach meeting is underway as I write this column (during a break between sessions). Roughly 2500 people attended the meeting and judging by the hoarse voices and happy grins mid-week, most valued the opportunity to speak with and hang-out with their colleagues. Organizing a meeting of this size and logistical complexity is not easy and takes real professionals working both on site and for years (literally) ahead of time to pull it off. Thankfully we have an amazingly competent AAS staff that work together to pull off the amazingly complex logistic exercise of a large scientific conference. Additionally, we rely on volunteers to help with many duties on site as well as our volunteer elected leaders (the Vice-Presidents) to build the scientific program.

As our meetings have grown, we have not significantly changed the structure or content of the meeting. Sure, we have added workshops, expanded our press services and made other changes, but the Society has not made any fundamental change to the core way the meeting is constructed from member contributions. This has led, some say unfortunately, to a huge number of parallel sessions of five-minute talks to provide a venue for all requested oral presentations and also large poster sessions that must change each day. The Council began some discussions at its meeting here in Long Beach about what the core value proposition of our meetings is and how we might enhance it. Mainly our meetings are about communication, both scientific and interpersonal. Having had to personally attempt to vacate the exhibit

hall at the end of the day, I can vouch for how much our attendees enjoy talking with each other. It doesn't help turning the lights off either...we're astronomers and perfectly happy talking on in a darkened hall!

We will be trying some experiments at upcoming meetings, both Indianapolis in June and Washington next January. We are hopeful that some of these Council-selected trial runs will enhance the meeting and when something works, we'll try and gracefully integrate it into our meeting program. Does this mean the sudden demise of five-minute talks? Well, probably not right away...it will take time to make any major change, but it does mean that the Council is performing one of its most important duties, thinking strategically and long-term about how the Society can help enhance our discipline and achieve our mission to enhance and share humanity's scientific understanding of the universe. You should thank all of them for serving you and your colleagues in this way and give them your ideas and input, which will be easier than ever on our new website. (p.s. we are "soft-launching" our site over the coming months, so stay tuned and stay patient as we bring this new and powerful system online at long last.)

Running a large meeting is more than logistically complex, it's expensive. I've described in many ways just how expensive it is, but I always remember that the reason it is expensive is not really any one piece (though food and beverage always makes up a major fraction of our meeting costs), but the sum of all the costs. We begin planning for each meeting by remembering our core goal, which is represented in the mission of the Society I quoted above. This goal means we have to have good audiovisual services. We have to have a smoothly functioning speaker presentation system (we have one of the best). We have to provide organized schedules, rooms with enough seating and signage to ease the flow of meeting attendees around the conference. We have to provide security to ensure the safety of our attendees and our exhibitors. We have to provide medical services in case of emergency. We have come to provide wireless Internet service throughout the meeting and to our exhibitors, averaging around 35 Mbps in bandwidth (p.s. that's expensive to provide). The list goes on and on. Additionally, our meetings have to cover a significant portion of staff salaries and benefits, as dues alone cannot cover all of those costs and we do not use proceeds from our journals to pay for ongoing society activities.

Costs add up and they add up fast. The challenge is to achieve the core goals for our meetings while doing so at a price that our attendees can afford. It's a tremendous challenge, but one that I think we are achieving. Our meeting registration is similar to that of similar scientific societies (APS, AGU, OSA) and very dissimilar from meetings in the for-profit sector, which can run into the thousands of dollars.

We will continue to inform our members and meeting attendees about what they're paying for in their meeting registration, but a significant chunk of what you get when you attend a meeting is intangible. It's a safe, organized environment to have conversation and interaction with your colleagues. It's thousands of hours of staff effort to organize and execute the conference. It's infrastructure that underlies the conference and makes things work right, like the speaker presentation system. We don't provide some of the tangible things that smaller conferences provide, like registration gifts or tote bags, but I think we do a much better and more comprehensive job on the intangibles...and it's the intangibles that help us achieve our mission to enhance and share humanity's scientific understanding of the universe...see you at an AAS conference soon!

As always, send me your ideas, thoughts, quips and tweaks...[kevin.marvel@aas.org](mailto:kevin.marvel@aas.org)  
**[mailto:kevin.marvel@aas.org]**

## Member Deaths

Crystal M. Tinch  
American Astronomical Society (AAS)

The Society is saddened to learn of the deaths of the following members, former members, and affiliate members:

Bertram D. Donn  
John Galt  
Robert Hobbs  
Arthur Page  
Stephan D. Price

## Council Actions AAS 221

Univ. of Texas, Austin

The following actions were taken by the AAS Council at their January 2013 meeting in Long Beach, California.

1. Accepted 2013 Prize awards from the various AAS Prize Committees
2. Approved the Minutes of the 220th Meeting (Anchorage, AK) as distributed.
3. Approved Executive Committee interim actions as presented.
4. Commended the Publications Board for its success in finding a new operational normal after years of challenging improvements, its vigilance in monitoring publication trends, potential new publication technologies, and reader-friendly improvements, and for organizing a futures meeting to probe new structures for AAS journals and technological opportunities for improvements.
5. Approved 2013 Budget Adjustments as presented.
6. Approved the 2013 AAS Appointments Committee recommendations for Prize Committees.
7. Approved the amendments and revisions to the AAS Bylaws as presented in [http://aas.org/files/resources/aas\\_bylaws\\_2012.pdf](http://aas.org/files/resources/aas_bylaws_2012.pdf)
8. Approved requested HEAD By-Laws amendments.
9. Approved an official and permanent appointment of the AAS Executive Officer to the Publications Board as an ex officio member.
10. Ratified the AGU statement on Climate Change.
11. Approved that an AAS Representatives Program be established.
12. Appointed Joseph W. Richards to the AAS Employment Committee.
13. Adopted a resolution from the AAS Sustainability Committee.
14. Established a sub-committee to develop a proposal to fund initiatives to increase AAS meeting participation.

## 2013 AAS Prize Winners

Crystal M. Tinch  
American Astronomical Society (AAS)



### **Kenneth C. Freeman - Henry Norris Russell Lectureship (Photo credit: Emily Moylan)**

The 2013 Henry Norris Russell Lectureship of the American Astronomical Society is awarded to Kenneth C. Freeman, Duffield Professor and Distinguished Professor at the Australian National University, for a lifetime of seminal contributions to the fields of galaxy structure and dynamics and stellar populations. Throughout his career, Ken Freeman has been a leader in our understanding of the structure and evolution of galaxies by combining theory and modeling with observations. Through his many Ph.D. students and his generous interactions with countless colleagues, his influence on Galactic and extragalactic astronomy has extended far beyond his own research.



### **Sarah Dodson-Robinson - Annie Jump Cannon Award**

The 2013 Annie Jump Cannon Award is given to Sarah Dodson-Robinson for her outstanding contributions to the study of the formation of planetary systems. Especially notable is how her insights into

giant planet formation in our own Solar System and in exoplanetary systems arise from broadly combining theoretical modeling with stellar and disk observations. She formed new models meshing disk structure, dynamics and chemistry and connected the metal and molecular content of disks with their mode of planet formation. She showed that both core-accretion and gravitational instability may operate in different regions around stars of different masses to form giant planets. She highlighted the importance of snow lines of different ice compositions for observers to measure.



**John R. Percy - AAS Education Prize**

For 40+ years of tireless advocacy for K-12 astronomy education in Canada and around the world, during which he has trained and mentored many people who themselves have made major contributions to astronomy, astronomy education, and amateur astronomy,

For leading and promoting effective partnerships with amateur astronomers and informal educators,

For his public outreach efforts and leadership through the IAU, the AAS, the ASP and the AAVSO,

For his role in programs that use astronomy to inspire youth all around Canada and in underserved communities throughout the world, and

For inspiring the international Galileo Project combining Astronomy, Music and visual Arts.



### **Mark Krumholz - Helen B. Warner Prize for Astronomy**

The Helen B. Warner Prize is awarded to Mark Krumholz for his major theoretical contributions in the areas of massive star formation and the interstellar medium, both in the Galaxy and in the early universe.



### **Jason Kalirai - Newton Lacy Pierce Prize in Astronomy**

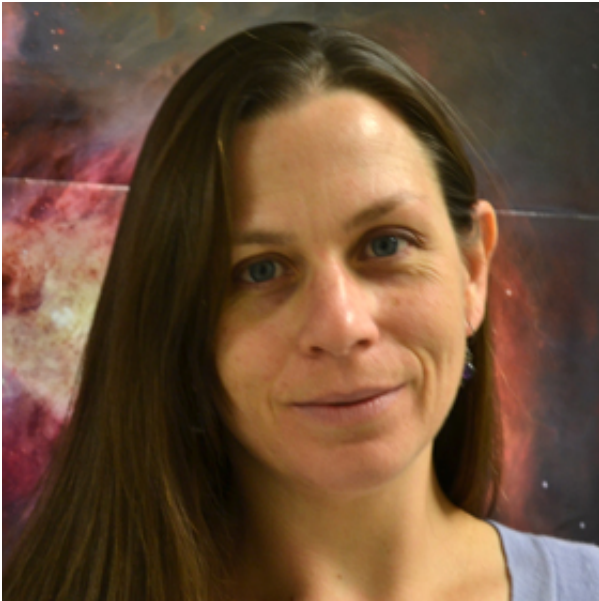
The Newton Lacy Pierce Prize in Astronomy is awarded to Jason Kalirai for major contributions to the field of stellar and Galactic astrophysics, including establishing a fundamental relation of stellar astrophysics, the initial-final mass relation, that maps the fraction of mass loss that stars experience over their lives.



### **Keith Matthews - Joseph Weber Award for Astronomical Instrumentation**

Keith Matthews has been selected for the 2013 Weber Prize in recognition of his many contributions to infrared astronomical instrumentation at the Palomar and Keck Observatories. The reliability, sensitivity and innovative qualities of his instruments have enabled ground breaking scientific discoveries for decades. For example, his NIRC2 camera behind the Adaptive Optics bench at Keck 2 was responsible for the characterization of the supermassive black hole at the center of our galaxy.





**Rachel Somerville - Dannie Heineman Award for Astrophysics**

The Heineman Prize for Astrophysics is awarded to Rachel Somerville for providing fundamental insights into galaxy formation and evolution using semi-analytic modeling, simulations and observations.



**Abraham Loeb - Chambliss Astronomical Writing Award**

This year's Chambliss Astronomical Writing prize is awarded to Abraham Loeb for his lively, but concise account, "How Did the First Stars and Galaxies Form?" (Princeton University Press 2010). Loeb addresses astronomical processes in a physically intuitive manner, with an emphasis on the big picture. This book provides excellent supplemental material for classes in cosmology and galaxy formation.



### **Kian Jek - Chambliss Amateur Award**

Kian Jek works in the Kepler Mission's Planet Hunters program. His work has been instrumental in the discovery of several planets that had been missed by the Kepler pipelines. His contributions are original and significant.

### **Division Prizes**

The AAS's five subject-specific divisions also award prizes, and two of them have just selected their 2013 recipients.



The High Energy Astrophysics Division (HEAD) is awarding its Bruno Rossi Prize to Alice K. Harding (NASA Goddard Space Flight Center) and Roger W. Romani (Stanford University) for establishing a theoretical framework for understanding gamma-ray pulsars. These unusual objects, the collapsed remnants of massive stars that have exploded as supernovae, are rapidly spinning neutron stars that emit gamma-ray photons and sometimes (but not always) radio photons. Work by Harding and Romani has helped elucidate that the radiation at different wavelengths comes from different regions of the pulsar that differences between pulsars can result from different orientations toward Earth and/or from different angles between the stars' spin and magnetic axes.



The George Ellery Hale Prize of the AAS Solar Physics Division (SPD) is awarded to a scientist for outstanding contributions to the field of solar astronomy. The 2013 prize goes to Richard Canfield (Montana State University) for his pioneering work on dynamics and radiation in solar flares and on the origins and implications of magnetic helicity in active regions, as well as for his role as a leader and mentor.



SPD's Karen Harvey Prize, which recognizes a significant contribution to the study of the Sun early in a person's professional career, goes to Tibor Torok (Predictive Science, Inc.) for his innovative numerical studies and theoretical analyses of the role of magnetohydrodynamical instabilities in the initiation and driving of coronal mass ejections.

## **Report on the National AAS Department Chairs Meeting**

Debra M. Elmegreen  
Vassar College

The biennial AAS Department Chairs Meeting was held in Chicago on Saturday, 3 November 2012, with about 35 chairs attending from around the nation. The meeting was sponsored by the AAS and organized by Jerry Sellwood (Rutgers) and David Kieda (Utah), with assistance from Jeri Cochran (Chicago). AAS

President David Helfand and Executive Officer Kevin Marvel represented the Society.

Jim Ulvestad gave an update on the NSF response to the Portfolio Review report on the Astronomy Division, explaining the thorough process and difficult decisions required in the current fiscal climate, and reviewing the implications and details during a lengthy discussion afterwards. Bill Smith from AURA circulated the AURA response to the NSF Portfolio review, which expressed concerns regarding the rapid pace of facility divestiture outlined in the NSF portfolio review, and the need to allow sufficient time to explore the formation of potential private consortia to run facilities on behalf of interested parties.

David Helfand discussed some new ideas for the AAS, including soliciting feedback on ways to increase AAS reach and visibility in astronomy departments across the country.

These ideas will be detailed in upcoming Newsletters. Debra Elmegreen highlighted the current status of the AAS Astronomy Ambassadors program, due to launch with a workshop at the Long Beach meeting in January and a website for sharing ideas, outreach experiences, and resources.

The chairs discussed mutual topics of interest, such as the development of new partnerships and consortia to manage telescopes that may lose federal funding, growth and attrition of astronomy faculty positions, changing demographics, qualifications and numbers of graduate school admittees, increased challenges in supporting graduate students through the duration of their degree program, the requirements and training in graduate school, outreach efforts, and meeting the needs of astronomy students who face increasingly wider-ranging jobs after graduation. Some of the major points are summarized below so that everyone can benefit from the useful information exchange.

### **Discussion on master's programs**

The chairs discussed the potential advantages of master's programs, which provide advanced training either for eventual Ph.D. pursuit or for future astronomy-related jobs. Bill Herbst noted that Wesleyan's Master's Program continues to seek committed students of high promise who might benefit from the extra time and assistance their course of studies provides. In addition to course work, each student writes an M.A. thesis. These students go on to Ph.D. programs or to careers in research support, education, outreach and other science-oriented fields. Women and minorities are particularly encouraged to apply. Phil Kaaret noted that Iowa also has a Master's program in Astronomy. Recent Masters of Astronomy have gone on to careers as varied as research scientist in electro-optics, officer-instructor in the Navy, and video game programmer (see <http://astro.physics.uiowa.edu/> [<http://astro.physics.uiowa.edu/>]).

Kelly Holley-Bockelmann discussed the Fisk-Vanderbilt Masters-to- Ph.D. Bridge program, which was initiated to give underrepresented students with undergraduate STEM degrees, but who require additional coursework or training before beginning Ph.D. -level work, the preparation needed to earn a Ph.D. in physics and astronomy. By completing an MA degree at Fisk University under the one-on-one guidance of faculty mentors, Bridge students develop the strong academic foundation and research skills that will foster a successful transition to the Ph.D. The program, which usually requires two years, is flexible and tuned to the goals and needs of each student. Courses are selected to address gaps in preparation, and students delve into research that develops and demonstrates their full scientific potential. Since its inception in 2004, the program has attracted over 50 underrepresented minority students (55% female),

with a retention rate of 92%. Since Bridge students began earning their degrees in 2010, the program has led the country in awarding Ph.D.s to underrepresented minorities in physics and astronomy, and is making a vitally important contribution to the astronomy workforce (see <http://www.vanderbilt.edu/gradschool/bridge/> ).

Dave Kieda briefly discussed the Professional Science Master's of Science program (PSM, <http://www.npsma.org/> ), which has developed joint programs in Science and management of Technology with an emphasis of integration into business and industry. The University of Utah has offered a PSM degree (<http://pmst.utah.edu/> ) since 2000, enrolling about 20 students per year in the two-year degree program. Students choose a particular emphasis such as computational science, science instrumentation, nanotechnology, environmental science, or biotechnology, and complete a formal internship as part of the degree program. Students pay full tuition to complete the degree program; this allows the program to cover its management costs. The PSM program has graduated over 100 students to date, providing an alternate career path to students interested in the career benefits of a graduate degree in the sciences, with an emphasis on application to business, industry and government, rather than academia.

Mitch Begelman noted that Colorado has discussed the establishment of a joint master's program on instrumentation for space and upper atmospheric platforms in collaboration with the Aerospace Engineering and Atmospheric and Oceanic Sciences dept. The idea is that aerospace companies would pay for employees to do this degree. However, the department decided not to proceed because they felt that they would need to offer a new layer of courses between the undergrad and Ph.D. level courses (the Master's students would not have adequate physics preparation to take the sequence of fluids and plasma courses) and they don't see a way to get the additional faculty needed. They were also skeptical that an adequate market exists.

### **Discussion on graduate school admissions**

Criteria for graduate school admission were discussed in order to compare practices among different departments, and to help inform chairs from primarily undergraduate institutions. Danny Dale remarked that at Wyoming, a student with a threshold of 30% on the physics GRE is likely to do well on both the qualifier and in the Ph.D. research. Below that, it is hit-and-miss. The department frequently does accept students below 30%, especially if someone comes from a good liberal arts college but didn't necessarily receive a full suite of undergraduate physics courses. Similarly, Tereasa Brainerd noted an historical review of Boston University Astronomy Ph.D. candidates, which showed that as long as a student's GRE Physics score was higher than about 25% to 30%, there was little correlation with the student's success in the program. When the GRE Physics score was lower than 20%, students tended to struggle in the program and were frequently unable to pass the department's written comprehensive exam. BU's acceptance rate for graduate applications is about 15%.

Dave Kieda commented that using the GRE as a proxy for the common exam may have unintended consequences. Using the Physics GRE to select both physics and Astronomy graduate students in a common admissions pool tends to handicap admission of students with astronomy undergraduate backgrounds since the typical undergraduate astronomy curriculum is not as strongly aligned to the Physics GRE exam content. There is a known gender and minority bias with the exam. Several other

departments echoed these sentiments about physics GREs; some are considering dropping the GRE requirement or counting it as the qualifying exam. Many emphasized the importance of other indicators such as a proven ability to be engaged in research.

### **Discussion on departments**

Several departments discussed telescope consortia partnerships such as with DCT, WIYN, MDM, ARC (APO), SALT, SMARTS, and SOAR. Tereasa Brainerd announced that Boston University has recently become the first permanent scientific partner with Lowell Observatory in the Discovery Channel Telescope. Other partners (currently with shorter term commitments than BU) are the University of Maryland, Goddard Space Flight Center, and the University of Toledo. Lowell Observatory is currently seeking additional partners, with a preference for that partner to be a single university.

Jonathan Williams reported that the Institute for Astronomy at the University of Hawaii is a large research institute spread over three islands. The tight budgets of recent years have affected the Institute in several ways, most notably with the potential closure of telescope facilities on Mauna Kea, but also through delays in replacement of retiring faculty and the size of incoming graduate classes. More positively, the Institute is expanding its instrumentation program on the Big Island, looking forward to the ATST on Maui, and beginning an undergraduate major at the main Hawaii campus on Oahu.

Many physics or combined physics and astronomy departments are recognizing the usefulness of having separate astronomy tracks. Jerry Sellwood reported that Rutgers has a single Physics & Astronomy graduate program, but with separate options with different course and degree requirements. The astronomy curriculum has just been revised. The candidacy exam is based on a review of an active area of research and is designed to lead in to an early start to research. Rutgers has recently expanded its faculty with several younger very active members who are keen to take on new students. Kelly Holley-Bockelmann noted that Vanderbilt has begun the process to offer a separate Ph.D. in astrophysics within the Department of Physics and Astronomy. This Ph.D. would still require physics courses such as Math Methods, but would implement a more rigorous astronomy curriculum by requiring the five current astronomy graduate courses to earn a Ph.D. Students seeking admission into the astrophysics Ph.D. program would be evaluated on the potential to do meaningful research, with only a minimal focus on the GRE score. If approved, the program should officially begin to offer admission to applicants as early as Fall 2014. Phil Kaaret announced that the University of Iowa offers a new sub-track in Astronomy for the Physics Ph.D. The majority of required course work is in astronomy and the qualifying exam can be passed via the Physics GRE.

Snezana Stanimirovic noted that the Department of Astronomy at Wisconsin has a policy for astronomy grad student medical and family leave, and are discussing a similar policy for postdoctoral researchers:

<http://www.astro.wisc.edu/grad-students/policies-procedures/medical-and-...>

[<http://www.astro.wisc.edu/grad-students/policies-procedures/medical-and-...>]

### **Discussion on undergraduate education**

Joel Bregman reported that the Department of Astronomy at the University of Michigan has established an interdisciplinary astronomy major and minor, designed for students interested in astronomy, but who do not intend to continue to graduate school. It is designed for students seeking to develop the kind of broad understanding of astronomical principles and practice ideal for technical positions in astronomy or

for careers like teaching, science writing, and outreach. It does not require the full math and physics sequence, and students can take a limited number of courses on topics such as the philosophy of science, the history of cosmology, or physics for educators.

Mitch Begelman noted that the Colorado undergraduate major, started only a decade ago, now has upwards of ~175 students. Part of the attractiveness is that we offer two tracks, an Astrophysics track for students intending to do a Ph.D., and an astronomy track aimed at students interested in careers K-12 STEM education, science writing, image processing, etc. The difference is mainly the level of math required and a couple of advanced physics courses. Many students in both tracks are interested in an Honors degree and in doing a senior thesis, as well as research projects earlier in the program. One challenge is to try to match up students with research projects, and particularly whether we can offer worthwhile research experiences for students who are not at the straight-A level.

Debra Elmegreen (Vassar), Bill Herbst (Wesleyan), and Karen Kwitter (Williams) noted that the Keck Northeast Astronomy Consortium of 8 East Coast liberal arts colleges, which originally started with funding from the Keck Foundation and now is an NSF REU program, has had over 250 undergraduate summer research students (about 50% female) since its founding in 1990.

### **Discussion on outreach and efforts beyond the department**

Many departments are very active in local outreach efforts. Dave Kieda noted that the University of Utah has been building a very successful Public Education and Outreach program through a combination of state and private funding. The University of Utah Astronomy program recently received a \$100K grant from the W. L. Eccles Foundation to upgrade their on-campus observatory for weekly public star parties, public use of the Frisco Peak Observatory, and special events with national coverage (e.g., Venus transit, annular eclipse, Curiosity landing on Mars). These events have each attracted 1000+ people from the general community, and have substantially increased undergraduate student enrollment in astronomy classes and astronomy majors.

Mitch Begelman noted that the Department of Astrophysical and Planetary Sciences collaborates with the Physics Department on a seminar series for undergrads and grad students, exploring career opportunities outside academia. The speakers are typically alumni who have followed various career tracks. This program was started as the outreach/educational component of an NSF Postdoctoral Fellowship but has been taken over by other postdocs who have volunteered their time. The interdisciplinary research institute JILA, which includes astrophysics, physics and chemistry, has a similar program.

Snezana Stanimirovic (Wisconsin) noted that there is also an ACS-sponsored Chemistry Ambassadors program, designed to provide community outreach in chemistry (like the AAS Astronomy Ambassadors program):

[http://portal.acs.org/portal/acs/corg/content?\\_nfpb=true&\\_pageLabel=PP\\_S...](http://portal.acs.org/portal/acs/corg/content?_nfpb=true&_pageLabel=PP_S...)

[[http://portal.acs.org/portal/acs/corg/content?\\_nfpb=true&\\_pageLabel=PP\\_S...](http://portal.acs.org/portal/acs/corg/content?_nfpb=true&_pageLabel=PP_S...)]

### **Future chairs meetings**

The departmental chairs and representatives enjoyed the lively discussions and exchange of ideas and department insights during this meeting. However, many expressed the desire for more departments to

participate in future meetings so that we have more complete geographic and large university representation. Mark your calendars to attend the next meeting in late fall 2014!

## **JWST Science Instrument Payload Update**

Matthew A. Greenhouse  
NASA's GSFC

The JWST science instrument payload is designed as a highly integrated module in which many systems are shared among the science instruments in order to reduce mass, power, and volume resources. This Integrated Science Instrument Module (ISIM) system is a 1.4 metric ton element of the JWST space vehicle that consists of four science instruments, a fine guidance sensor (FGS), 7 other shared hardware systems and two shared software systems. It completed its system-level critical design review during 2009 and is currently in integration and test (I&T) at Goddard Space Flight Center in Greenbelt MD. A description of the ISIM is available at: Greenhouse, M.A., et al., 2010, Proc SPIE, 7731 and references therein. Its science instruments include: a Near-Infrared Camera (NIRCam), a multi-object Near-Infrared Spectrometer (NIRSpec), a Mid-Infrared camera and spectrometer (MIRI), and a Near-Infrared Imaging Slitless Spectrometer (NIRISS). Functional capability of the instruments is described at: [www.jwst.nasa.gov](http://www.jwst.nasa.gov) [<http://www.jwst.nasa.gov>].

Two science instruments (MIRI and NIRISS), the FGS, and 5 support systems (optical metering structure, ISIM electronics compartment, ISIM remote services unit, ISIM command & data handling system) have been completed through flight qualification testing and have been delivered to ISIM-level I&T. Delivery of the remaining hardware systems (cryogenic thermal control system and harness radiator system) is expected during January 2013.

MIRI, NIRISS, and FGS are currently undergoing electrical tests with the above flight systems, which were represented by simulators during instrument-level qualification. Each science instrument shares a common computer system with instrument specific software applications and a real time process control script system residing on a common ISIM flight software system. MIRI, NIRISS, and FGS applications and scripts are currently undergoing test with the ISIM flight software system.

The NIRCam instrument is currently in its second of three planned instrument-level cryo-vacuum test cycles at Lockheed Martin Advanced Technology Center in Palo Alto California. The NIRSpec instrument will begin its second instrument-level cryo-vacuum test at EADS Astrium GmbH in Ottobrunn Germany during December 2012. Delivery of both instruments to ISIM I&T is expected during summer 2013.

Completion of ISIM ground support equipment is on track to support ISIM-level cryo-vacuum testing. The ISIM will be tested in the Space Environment Simulator (SES) using a high fidelity cryogenic optical simulator of the JWST telescope (OSIM). The SES helium shroud system has completed performance testing, and the OSIM has completed 1 of 2 planned cryogenic performance tests in the SES.

The ISIM cryo-vacuum test is among the most complex space environmental tests ever conducted. This testing will begin during Spring 2013 with a risk reduction test cycle that will include MIRI, and NIRISS



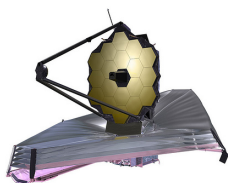
science instruments, FGS, and all of ISIM's other systems. Two subsequent comprehensive performance test cycles containing all of the science instruments will occur during 2014 and 2015. The ISIM will be delivered to observatory-level I&T during Autumn 2015.

Re-manufacture of ISIM's near-infrared detectors was initiated during 2010 after discovery of degradation in pixel operability with prolonged ambient storage (Rauscher, B. J., et al. 2012, AIP Advances, 2(2), 021901). Root cause of the degradation was identified; prototypes of a new design were manufactured and flight qualified during 2011. Flight manufacture is on schedule, and the first flight units have been delivered to the NIRCam for detailed characterization. Installation of the new detectors will occur during 201

## JWST Resources from AAS 221

Jason S. Kalirai

Space Telescope Science Institute



The James Webb Space Telescope project continued to make solid progress in 2012. Several of the key mission milestones were completed this past year, and the telescope is on track for an October 2018 launch. The JWST team participated in the 2013 AAS meeting in Long Beach CA, and presented the community with a number of updates on the present status of the project, the future outlook, and the science opportunities. Many of the resources from the meeting are now available online.

The science case of JWST continues to grow as astronomers identify new questions and opportunities. To highlight these, the team organized a special science session at this year's meeting. Session number 135, "Scientific Opportunities with JWST", featured six presentations by AAS members on topics including planetary science, star formation, the Galactic center, the Magellanic Clouds, strong lensing and dark matter, and ultra-deep field imaging and spectroscopic studies. STScI webcasted this session in real time, and have now posted all of the science presentations and slides on our website, <https://webcast.stsci.edu/webcast/detail.xhtml?talkid=3387&parent=2> [<https://webcast.stsci.edu/webcast/detail.xhtml?talkid=3387&parent=2>].

One of the annual highlights of the project is to update the community on the technical progress of JWST. The team did this during session 318, the "JWST Town Hall." This year's Town Hall featured three short presentations followed by a Q&A with the community. Eric Smith (NASA HQ) started by reporting the recent progress on the JWST hardware, including the delivery of two of the four science instruments from the European and Canadian Space Agencies to NASA. Eric also showed the JWST schedule from now until launch in October 2018, and pointed out the major milestones along the way. Following Eric, Randy Kimble (NASA GSFC) gave a short update on the integration and test plan of JWST over the next five years. The final presentation was given by recent Kavli prize winner, Mike Brown (Caltech), who highlighted the tremendous potential of JWST for characterizing outer bodies in the Solar System. STScI also webcasted this session. All of the presentations and slides are available here, <https://webcast.stsci.edu/webcast/detail.xhtml?talkid=3388&parent=2> [<https://webcast.stsci.edu/webcast/detail.xhtml?talkid=3388&parent=2>].

The JWST team interacted with hundreds of astronomers at the STScI booth, where we had science brochures and guides, multimedia products, and a survey on user tools. The survey is still open, and the community is encouraged to complete it, <https://docs.google.com/spreadsheet/viewform?formkey=dEFSMkpjY1d6TF81RnNNTm1GQlc1T1E6MA#gid=0> [<https://docs.google.com/spreadsheet/viewform?formkey=dEFSMkpjY1d6TF81RnNNTm1GQlc1T1E6MA#gid=0>].

A new product that the team unveiled this year was the “Webb Telescope iBook.” The iBook provides an interactive view of JWST, including its science goals and engineering. Although it was designed for the general public, many astronomers at the meeting enjoyed exploring it on our iPads. The Webb Telescope iBook, as well as a “Hubble Space Telescope: Discoveries” iBook, is a free download in iBooks or from <http://hubblesite.org/ibooks/> [<http://hubblesite.org/ibooks/>] (you can also search for “James Webb Space Telescope” in the iTunes store). Since the release about a month ago, the two iBooks have been downloaded more than 100,000 times.

The large amount of astronomy research being presented at the AAS offers a unique opportunity to communicate science to the broader public. While there are formal press releases, many of the posters and talks are not captured in any type of release. STScI organized a google hangout on each day of the AAS, from the exhibit hall. During the hangouts, different astronomers popped by to tell the world why they came to the Long Beach AAS meeting. Even the NASA Associate Administrator for the Science Mission Directorate, and former astronaut, John Grunsfeld, stopped by to talk about heliophysics. The hangouts have been seen by thousands of people, and are posted on youtube.

In addition to these events, the JWST team participated in many other activities in Long Beach. This included doing an interview for the Planetary Society’s Planetary Radio program (even Bill Nye weighed in – posted at [www.planetary.org](http://www.planetary.org) [<http://www.planetary.org>] ), giving talks at the NASA hyperwall, and giving an evening public talk at the nearby Columbia Memorial Space Center.

To keep up with JWST until the next AAS meeting, follow our conversations using #JWST on twitter.

## **Improving the Status of Women in Physics (and Astronomy) Departments**

Edmund Bertschinger  
MIT

Women are now more than 1/3 of physics majors at several top universities and 28% of astronomy assistant professors were women in 2006<sup>1</sup>. Long gone are the days when women were barred from faculty positions in science departments and were not permitted to observe at some astronomical observatories<sup>2</sup>. Yet women still face challenges that men do not, and this limits the success of the academic research enterprise. Some readers may challenge this premise and I invite them to learn about this topic by attending a Women in Physics or Women in Astronomy meeting. Other readers may be curious about how to improve their departments. This article offers suggestions based on my experience serving for five years as MIT Physics Department Head as well as my service on the Committee on the Status of Women in Astronomy.

The most important lesson I have learned is that committed leadership matters. Leaders are the stewards of institutional culture<sup>3</sup>. The tone set by a leader permeates an organization. A dismissive leader makes it very difficult to change a poor workplace environment. Conversely, a leader who consistently shows respect and gives encouragement enables a virtuous cycle of increased satisfaction and accomplishment. Sometimes the respect is merely an acknowledgement that inequities are present in lab space, salary, institutional awards or service roles, followed by a commitment to right the wrong<sup>4</sup>.

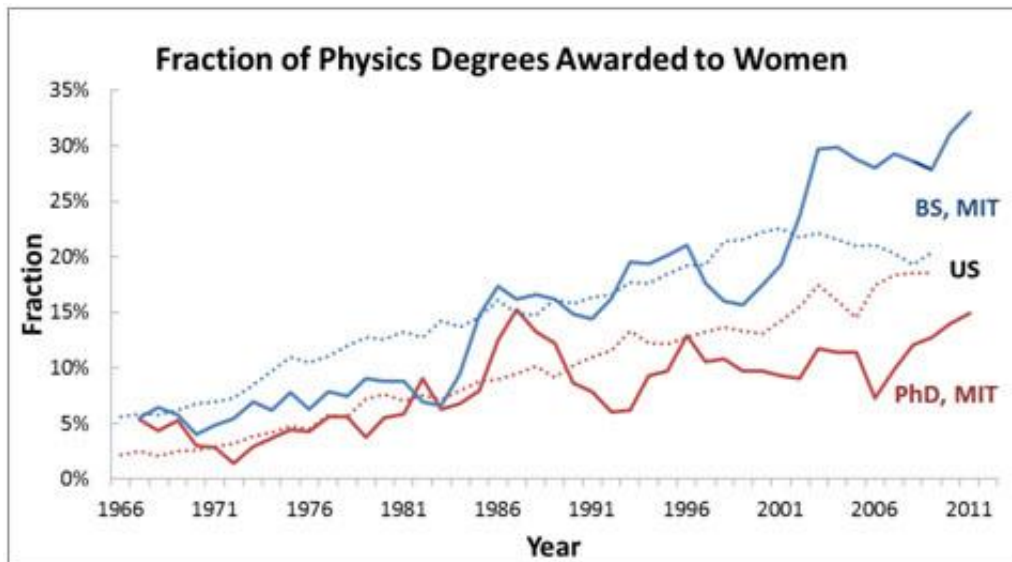


Figure 1: Undergraduate (blue, upper pair) and PhD (red, lower) physics degree statistics from MIT (solid, computed with a three-year boxcar average) and US national averages (dotted). Data from the American Physical Society, IPEDS Completion Survey, and MIT Office of Institutional Research.

These effects are apparent even at the level of individual departments. I compiled the fraction of physics degrees (undergraduate and graduate) awarded to women at MIT over several decades, and compared with nationwide totals (Figure 1). Several notable increases and decreases accompany leadership changes. Curricular changes also matter, especially at the undergraduate level<sup>5</sup>. For example, after the introduction of a flexible degree option in 2000, physics enrollments more than doubled, with the greatest increases occurring for women. This analysis extends earlier work done by then-undergraduate Laura Lopez<sup>6</sup>. The variation of female fraction across departments is large. Several other institutions have achieved similar successes (e.g. Florida International, UTEP, Yale) which also appear to correlate with leadership and curricular reform<sup>7</sup>. You and your students may find such a study similarly illuminating.

Why do numbers matter? While it is difficult to quantify a subjective sense of climate<sup>8</sup>, there is no doubt that the atmosphere is very different in my department now that women make up 1/3 of our undergraduate physics students. The department culture is collaborative and supportive. Students thrive. I believe that all faculty members acknowledge the change is positive.

The fraction of women decreases at the graduate level and, in some fields, decreases further at the postdoctoral and faculty levels. Why? Is this a bad thing? If so, what can be done about it?

Six years ago I met with our Graduate Women in Physics group and sought their advice about these issues. I was profoundly affected by this meeting. First, the students gave me the confidence that I could

make a difference. Second, they told me what I had to do: create a culture of caring.

Their advice resonated with me. More than 25 years ago I had suffered Imposter Syndrome upon starting my faculty appointment<sup>9</sup>. Junior faculty coming to the end of their appointments told me the competition was fierce and I should expect to fail. As a survivor, I was determined to change the culture around me. I began with mentoring and gradually expanded the circle of respect and encouragement while consistently pushing for excellence. The graduate women empowered me to apply this prescription to the entire department.

I am sometimes asked what one thing I have done to increase diversity and to improve the climate in my department. It is to show respect. Respect others by listening to them, especially those whose voices have not been heard. Respect them by addressing their concerns. Show respect by learning best practices<sup>10</sup>. If you try instead to produce or work from a checklist, you are on the wrong course. There is no substitute for caring leadership.

Some will object that difficult people prevent establishment of such a culture of caring. One grumpy, misogynistic tenured faculty member can cause many difficulties, but he cannot prevent change. Committed leadership is essential in handling such cases. Even such faculty members generally respond favorably to respect wrapped around clear standards of behavior. Department chairs have sticks as well as carrots to offer. If the department chair is unable to handle such problems effectively, a dean or higher officer can. But I believe most cases are best handled at the department level. Department chairs need training in personnel management which can be acquired at their university or from other professionals<sup>11</sup>. The Committee on the Status of Women in Astronomy can be a resource<sup>12</sup>.

Whether or not you are a department leader, you will be more effective by identifying allies at your university and across your profession. The importance of collaboration is growing in physics and astronomy because it enables research that cannot be accomplished by individuals. The same is true in fostering diversity and inclusion. Allies also provide advice and mentoring. For me, they provide positive energy and support which is important for sustaining effective leadership.

You may be surprised who your best allies will be. I have found staff members from all across the university to be the most committed volunteers eager and able to help foster a culture of caring. Whether they are administrators, administrative assistants, or service workers, staff members thrive and contribute best when shown respect and treated as allies. They can do wondrous things, such as organize a major university event as volunteers which stimulates a year-long discussion of diversity and excellence. This is what happened recently at MIT<sup>13</sup>.

When it comes to addressing gender inequity, men can be effective allies<sup>14</sup>. We all harbor implicit bias, and people who violate gender stereotypes attract notice. While I am uncomfortable with the inequity of being taken more seriously by male colleagues because of my gender<sup>15</sup>, I care about results. I have repeatedly used my gender to advance discussions of women in science and engineering<sup>16</sup>.

Implicit bias remains an important problem limiting the numbers and success of women in physics and astronomy. I am continually astonished that some scientists doubt its existence. I wish every such person could have the experience of a male undergraduate who attended the 2011 Conference for

Undergraduate Women in Physics at MIT. This student attended on a dare from a female classmate who also attended the conference. He began paying attention when a very successful senior physicist spoke about her career path. At one point, the senior physicist described a meeting of about 30 women in physics that her husband had attended with her. The husband, also a physicist and a faculty member, recounted that his first reaction had been to run out of the room. However, his next thought was “this is what it is like for you every day.”

The undergraduate male listening to the woman’s experience was speechless. Later that day he was still reeling from the new perspective given him by the lecture and his experience at a conference being vastly outnumbered by women. He committed to sharing his insight with fellow students. That day, implicit bias was revealed and an ally was made.

It is not easy to convince senior faculty members that they may be biased, despite decades of research showing such bias in others<sup>17</sup>. Sometimes, direct experience of the Implicit Associate Test<sup>18</sup> can help. However, in matters of recruitment, it is unsafe to neglect implicit bias. That is why many universities require search committee training<sup>19</sup> and affirmative action review. To be most effective, responsibility for this training should be taken by the department chair or dean.

If you are not the department chair, what can you do to improve the status of women in your department? You can start by finding allies among staff, students, postdocs, and faculty. Invite the department chair to lunch. Share with him or her what you feel works well in the department, then give one or two examples of problem areas where the chair can make a difference. I like the strategies recommended by John Kotter in his book *Leading Change*. Help the chair achieve some small early successes before asking for more challenging remedies. If progress stalls, ask the chair (if Physics) to consider inviting a Climate Site Visit review to be conducted by the Committee on the Status of Women in Physics<sup>20</sup>.

In the end, we all want our departments to be the best they can, which can happen only when all of the members thrive. In my experience, people do their best when a culture of caring and respect is established. It may take a decade or more for the culture to complete this transformation. Sustaining it requires continued care and attention. When the tools of cultural transformation are learned in graduate school, we will be on our way to full equity.

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<sup>1</sup>American Institute of Physics Statistical Research Center; <http://www.aip.org/statistics/> [<http://www.aip.org/statistics/>]

<sup>2</sup><http://www.aip.org/history/cosmology/ideas/women.htm> [<http://www.aip.org/history/cosmology/ideas/women.htm>]

<sup>3</sup>E. H. Schein, *Organizational Culture and Leadership*, San Francisco: Wiley & Sons (2010)

<sup>4</sup>*A Study on the Status of Women Faculty in Science at MIT*, 1999; <http://web.mit.edu/fnl/women/women.html> [<http://web.mit.edu/fnl/women/women.html>]

<sup>5</sup>B. L. Whitten, S. R. Foster, & M. L. Duncombe, *What Works for Undergraduate Women in Physics?* *Physics Today*, 56, 46 (September, 2003); <http://dx.doi.org/10.1063/1.1620834> [<http://dx.doi.org/10.1063/1.1620834>]

<sup>6</sup>L. A. Lopez, poster presented at the Women in Astronomy II Conference (Pasadena, 2003); <http://www.aas.org/cswa/MEETING/lopez1.pdf> [<http://www.aas.org/cswa/MEETING/lopez1.pdf>]

- <sup>7</sup>V. Incera, *Making Cinderella Shine Without Magic*, APS Gazette, vol 31., no. 2, 1 (Fall 2012); <http://www.aps.org/programs/women/reports/gazette/upload/GAZ-fall2012.pdf> [<http://www.aps.org/programs/women/reports/gazette/upload/GAZ-fall2012.pdf>] ; L. Kramer, E. Brewe, & G. O'Brien, *Improving Physics Education through a Diverse Research and Learning Community at Florida International University*, APS Forum on Education Newsletter, Summer 2008; <http://www.aps.org/units/fed/newsletters/summer2008/kramer.cfm> [<http://www.aps.org/units/fed/newsletters/summer2008/kramer.cfm>]
- <sup>8</sup>Sociological research suggests that about 25% is required, e.g. M. E. Heilman, *Organiz. Behav. Hum. Perf.* 26, 386 (1980); [http://dx.doi.org/10.1016/0030-5073\(80\)90074-4](http://dx.doi.org/10.1016/0030-5073(80)90074-4) [[http://dx.doi.org/10.1016/0030-5073\(80\)90074-4](http://dx.doi.org/10.1016/0030-5073(80)90074-4)]
- <sup>9</sup><http://womeninastronomy.blogspot.com/2011/12/impostors-welcome.html> [<http://womeninastronomy.blogspot.com/2011/12/impostors-welcome.html>]
- <sup>10</sup>E.g., Gender Equity report, American Physical Society; <http://www.aps.org/programs/women/workshops/gender-equity/upload/genderequity.pdf> [<http://www.aps.org/programs/women/workshops/gender-equity/upload/genderequity.pdf>]
- <sup>11</sup>E.g., <http://www.departmentchairs.org/online-training.aspx> [<http://www.departmentchairs.org/online-training.aspx>]
- <sup>12</sup><http://www.aas.org/cswa/diversity.html#howtoincrease> [<http://www.aas.org/cswa/diversity.html#howtoincrease>]
- <sup>13</sup>Institute Diversity Summit 2012; [http://diversity.mit.edu/sites/default/files/institute\\_diversity\\_2012.pdf](http://diversity.mit.edu/sites/default/files/institute_diversity_2012.pdf) [[http://diversity.mit.edu/sites/default/files/institute\\_diversity\\_2012.pdf](http://diversity.mit.edu/sites/default/files/institute_diversity_2012.pdf)]
- <sup>14</sup>N. Hopkins, *Diversification of a University Faculty: Observations on Hiring Women Faculty in the Schools of Science and Engineering at MIT*, MIT Faculty Newsletter, vol. 18, no. 4 (March/April 2006); see also the January, 2011 CSWA Town Hall What Can Men Do to Help Women Succeed in Astronomy? <http://www.aas.org/cswa/Jan11/townhall.html> [<http://www.aas.org/cswa/Jan11/townhall.html>]
- <sup>15</sup>B. A. Barres, *Does gender matter?* *Nature* 442, 133 (2006); <http://dx.doi.org/10.1038/442133a> [<http://dx.doi.org/10.1038/442133a>]
- <sup>16</sup>E. Bertschinger, *Leaders in Science and Engineering: The Women of MIT*, STATUS, American Astronomical Society, June/July 2011, 11 (2011)
- <sup>17</sup>C. A. Moss-Racusin, J. F. Dovidio, V. L. Brescoll, M. J. Graham, & J. Handelsman, *Science faculty's subtle gender biases favor male students*, *Proc. Natl. Acad. Sci.* 109, 16474 (2012) ; <http://dx.doi.org/10.1073/pnas.1211286109> [<http://dx.doi.org/10.1073/pnas.1211286109>]
- <sup>18</sup>Project Implicit, <http://implicit.harvard.edu/> [<http://implicit.harvard.edu/>]
- <sup>19</sup>ADVANCE Program for Faculty Searches and Hiring, U. Michigan; <http://www.advance.rackham.umich.edu/handbook.pdf> [<http://www.advance.rackham.umich.edu/handbook.pdf>]
- <sup>20</sup>APS Climate for Women Site Visits, <http://www.aps.org/programs/women/sitevisits/index.cfm> [<http://www.aps.org/programs/women/sitevisits/index.cfm>]

# Communicating Science 2013: Workshop Applications Now Open

Maria Drout  
Harvard University



Applications are now open (<http://workshop.astrobites.com/> [<http://workshop.astrobites.com/>]) for the Communicating Science 2013 workshop, to be held in Cambridge, MA, 13-15 June 2013. Graduate students at US institutions in all fields of science and engineering are encouraged to apply--funding is available for travel expenses and accommodations.

**ComSciCon13**

Participants will build the communication skills that technical professionals need to express complex ideas to their peers, experts in other fields, and the general public.

There will be panel discussions on the following topics:

- \* Engaging Non-Scientific Audiences
- \* Science Writing for a Cause
- \* Communicating Science Through Fiction
- \* Sharing Science with Scientists
- \* The World of Non-Academic Publishing
- \* Communicating using Multimedia and the Web

In addition to these discussions, ample time is allotted for interacting with the experts and with attendees from throughout the country to develop new science outreach collaborations. Workshop participants will produce an original piece of science writing and receive feedback from workshop attendees and professional science communicators.

The workshop is organized by graduate students, authors of Astrobits ([astrobites.org](http://astrobites.org/) [<http://astrobites.org/>]) and Chembits ([chembits.org](http://chembits.org/) [<http://chembits.org/>]), and supported by Harvard Graduate School of Arts and Sciences and Faculty of Arts and Sciences.

## Graduate Student Blues

Liam McDaid  
Sacramento City College

There's a recent and already infamous communication that's been going around the astronomy community that has raised some disturbing issues of work-life balance and perceptions of such. It can be viewed at: <http://jjcharfman.tumblr.com/post/33151387354/a-motivational-correspondance> [<http://jjcharfman.tumblr.com/post/33151387354/a-motivational-correspondance>]. It is couched in the language of claiming to speak truth about the difficulties of finding work as a research astronomer and makes claims about what aspiring graduate students should expect in terms of workload. The tone is troubling at best and the claims are specious, but what's more disturbing are the comments responding to this email that are of the "they're just telling it like it is" variety. It is common for people at the bottom of

any ladder to be taken for granted because they are just “paying their dues,” as expected.

What should graduate students really expect as their workload in astronomy programs? Clearly, claims of 100-hour workweeks over any length of time are fantasies generated by false nostalgia. Responses to this communication on *Astrobites* show that very few people at any level in astronomy work over seventy hours per week ( $n = 414$  for question of hours worked per week): ([http://astrobites.com/wp-content/uploads/2012/10/Focus\\_hrs\\_hist1.png](http://astrobites.com/wp-content/uploads/2012/10/Focus_hrs_hist1.png) [[http://astrobites.com/wp-content/uploads/2012/10/Focus\\_hrs\\_hist1.png](http://astrobites.com/wp-content/uploads/2012/10/Focus_hrs_hist1.png)]). This doesn't mean that graduate school is easy nor doesn't require enormous effort. How much is enough? It may seem to be a Sisyphean task: if you don't work very hard you clearly won't succeed, but if you work your absolute hardest and make all required sacrifices, “success” is not certain. “Success”, however, is in the eye of the beholder. If your definition includes a Pulitzer prize, an Emmy-award winning TV series and continuing best-selling books about astronomy, then you are in the wrong place. Nowadays, a full professorship at a major-league university seems only somewhat less attainable. Not to mention a permanent fellowship at a major research institution where undergraduates are rarely, if ever, seen.

Even if your goals are far more modest, how much stress should one tolerate in graduate school? I'm hoping no one answered “as much as you can take”. Most people reading this can likely recall an instance when they were in graduate school where someone cracked under the stress and may have acted out in ways that ended badly for that person. Or at least embarrassingly. Mental health issues are often avoided by many in American culture, but shouldn't people who use their minds for a living be a bit more concerned about it? Graduate school should have multiple end options and people should have the ability to find a path that fits them without burning out. But are there multiple (successful) exit strategies for astronomy grad students? If not, then why not?

Some of this can be laid at the feet of institutional barriers. Barriers that originate from mentalities that actually get in the way of the survival of our field in the long term. Examples abound. The casual denigration of a “terminal” master's degree, which sounds like an inoperable condition. An M.S. is still sufficient for many jobs in industry, although I will take no bets on how much longer that will be true. The idea that for a possessor of the astronomy PhD an astronomy research career is the only “worthy” one, which many of my colleagues in the field of astronomy education research become understandably livid over. Especially since *they do research*. The continuing lack of balance in gender and ethnicity ([http://astrobites.com/wp-content/uploads/2012/10/wm\\_hist1.png](http://astrobites.com/wp-content/uploads/2012/10/wm_hist1.png) [[http://astrobites.com/wp-content/uploads/2012/10/wm\\_hist1.png](http://astrobites.com/wp-content/uploads/2012/10/wm_hist1.png)]). Whether all these problems stem from the same mental model of graduate school many have is a question worth researching, but the points in common are evident.

Perhaps the whole approach to how graduate school in astronomy works and the goals of such programs need to be examined. It would be a perfect topic for someone in the astronomy education field (hint, hint). I would expect that anything gained from such a study would aid in the teaching of undergraduates as well. In the end, if graduate school is just designed or perceived to be an obstacle course with a game of musical chairs at the end, then what's the point? Does that make better researchers or merely more exhausted, frustrated and insecure ones?

So what responsibilities do graduate students have in all this? Finding out specifically what is expected of them in the program they are in, early on. How many hours? What resources are available to assuage



any stress and help them adjust to the hectic life of grad school? Is this something the graduate student in question can or is willing to do? Whatever the answers are, keeping an open and honest channel of communication is vital to success. It's also at the heart of the scientific process.

*The AAS Committee on Employment is pleased to highlight useful resources for astronomers, and welcomes your comments and responses to this and previous columns. Check out our website ([www.aas.org/career/](http://www.aas.org/career/) [<http://www.aas.org/career/>]) for additional resources and contact information for the committee members. We are always looking for guest columnists in non-academic careers. If you are willing to contribute, or have an idea for a future column, please contact the Employment Column Editor, Liam McDaid ([mcdaidl@scc.losrios.edu](mailto:mcdaidl@scc.losrios.edu) [<mailto:mcdaidl@scc.losrios.edu>]). The AAS committee on employment exists to help our members with their careers. Your ideas are important, so let's hear them!*

## Honored Elsewhere

Crystal M. Tinch  
American Astronomical Society (AAS)

### **AAS members among New Class of AAAS Fellows**

In October 2012, the AAAS Council elected 701 members as Fellows of AAAS. These individuals will be recognized for their contributions to science and technology at the Fellows Forum to be held on 16 February 2013 during the AAAS Annual Meeting in Boston, Massachusetts. The new Fellows will receive a certificate and a blue and gold rosette as a symbol of their distinguished accomplishments.

Congratulations to the following members:

Lynn R. Cominsky, Sonoma State Univ.  
Eli Dwek, NASA Goddard Space Flight Center  
Bruce G. Elmegreen, IBM T.J. Watson Research Center  
Neal J. Evans II, Univ. of Texas at Austin  
Neil Gehrels, NASA  
Sun Kwok, Univ. of Hong Kong  
Angela V. Olinto, Univ. of Chicago  
Richard William Pogge, Ohio State Univ.  
Nathan A. Schwadron, Univ. of New Hampshire  
Keivan Guadalupe Stassun, Vanderbilt Univ.  
Michiel van der Klis, Astronomical Institute Anton Pannekoek, Netherlands  
G. Mark Voit, Michigan State Univ.

Arthur M. Wolfe, Univ. of California, San Diego

[http://www.aaas.org/news/releases/2012/1130fellows\\_2012.shtml](http://www.aaas.org/news/releases/2012/1130fellows_2012.shtml)  
[[http://www.aaas.org/news/releases/2012/1130fellows\\_2012.shtml](http://www.aaas.org/news/releases/2012/1130fellows_2012.shtml)]

### **Freeman awarded 2012 Prime Minister's Prize for Science**

Professor Ken Freeman, the Duffield Professor of Astronomy at the Australian National University's Mt Stromlo Observatory, was awarded the \$300,000 Australian Prime Minister's Prize for Science 2012 for his role in the discovery of dark matter and for his ongoing research on galaxy structure and composition.

<http://www.scienceinpublic.com.au/prime-ministers-prize/2012pmsprize>  
[<http://www.scienceinpublic.com.au/prime-ministers-prize/2012pmsprize>]

### **Einasto wins 2012 Viktor Ambartsumian Prize**

Jaan Einasto (Tartu Observatory) is the winner of the 2012 Viktor Ambartsumian Prize "for his fundamental contributions to the discovery of dark matter and the cosmic web."

The Viktor Ambartsumian International Prize is one of the important awards in astronomy/astrophysics and related sciences. It is being awarded to outstanding scientists of any nationality having significant contribution in astrophysics and those fields of physics and mathematics in which Ambartsumian had contributions. The Prize totals USD 500,000 and is being awarded once each two years, starting with 2010.

<http://vaprizesci.am/win2012.html> [<http://vaprizesci.am/win2012.html>]

### **Faber receives the National Medal of Science**

The White House announced that Sandra Faber (UC Santa Cruz) is one of a dozen researchers selected by President Obama to receive the National Medal of Science. Faber, a University Professor of astronomy and astrophysics at UCSC and the interim director of UC Observatories, will receive the award from the president at a White House ceremony in early 2013.

<http://news.ucsc.edu/2012/12/national-science-medal.html>  
[<http://news.ucsc.edu/2012/12/national-science-medal.html>]

## **Planetary Graduate Program Clearinghouse**

Nicholas M. Schneider  
Univ. of Colorado

Do you advise undergraduates on where to apply to grad school? Do you have trouble remembering all the programs and keeping up to date (especially in planetary science)? Do you want to get the word out on your own graduate program? The DPS Education & Public Outreach Subcommittee has assembled a listing of 68 institutions offering graduate degrees with a focus on planetary science:

<http://dps.aas.org/education/graduate-schools> [<http://dps.aas.org/education/graduate-schools>]

So, please send this link to students you mentor and mailing lists of majors. We especially want the webpage to be up-to-date and accurate, so please also send it to your own graduate admissions liaisons for updates and corrections. Application deadlines are imminent, so please help get the word out!

## **ACS-PHYS Division**

Crystal M. Tinch

American Astronomical Society (AAS)

We are pleased to announce that at the national meeting of the American Chemical Society in Philadelphia, the ACS-PHYS division established a new Astrochemistry Subdivision. Astrochemistry is the study of the abundances and chemical reactions of atoms, molecules, and ions and how they interact with radiation in both gas and condensed phases in Solar Systems and in the Interstellar Medium. The new Subdivision provides an interdisciplinary "home" for individuals interested in this growing research area. In addition, the Subdivision contributes to PHYS Division programs in areas of special interest to Astrochemists.

We would like to invite you and the undergraduate students, graduate students, and postdoctoral fellows to join the ACS Astrochemistry Subdivision to connect to an exciting research endeavor and to further promote the Astrochemistry Subdivision at (international) meetings, in your university, and in your department. Additional information on joining the Subdivision may be found at:

<http://www.chem.hawaii.edu/Bil301/ACSAstrochemistry.html>

[<http://www.chem.hawaii.edu/Bil301/ACSAstrochemistry.html>]

<http://www.chem.hawaii.edu/Bil301/ACSAstrochemistryjoin.html>

[<http://www.chem.hawaii.edu/Bil301/ACSAstrochemistryjoin.html>]

An inaugural Astrochemistry Symposium will be held at the Fall ACS National Meeting in Indianapolis, IN, 8-12 September 2013. Please also email us ([ralfk@hawaii.edu](mailto:ralfk@hawaii.edu) [<mailto:ralfk@hawaii.edu>] , [asuits@chem.wayne.edu](mailto:asuits@chem.wayne.edu) [<mailto:asuits@chem.wayne.edu>] , [mhg@cchem.berkeley.edu](mailto:mhg@cchem.berkeley.edu) [<mailto:mhg@cchem.berkeley.edu>] ) with suggestions for forthcoming ACS Astrochemistry Symposia and nominations for officers for the Astrochemistry subdivision.