

Astro2010 Town Hall Minutes (Notes taken by Brian O'Shea, oshea@msu.edu)

5 March 2009

Michigan State University

4270 Biomedical and Physical Sciences Building

Representatives from Astro2010:

Steve Zepf (Panelist, "Galactic Neighborhood")

Meg Urry (Panel chair, "Galaxies Across Cosmic Time")

Primary points from this meeting:

1. One of the primary goals of the decadal review should be to publicize astronomy, both in and of itself because it's exciting, and because it has the ancillary benefit of bringing people into science that end up doing things that are more directly productive to society. Emphasizing education and public outreach by the entire community is going to help us out a lot, particularly in a rough budget climate. As a community, we need to "sell the science" and also explain to political representatives why astronomy is good for THEIR district (jobs, education, etc.)
 2. Having three different funding agencies is probably a good thing – although they have very different funding priorities, philosophies, and cultures, a diverse funding ecosystem is probably best for the field in the long run. Similarly, international/private partnerships will be critical in the next decade to maintain our competitiveness.
 3. One of the larger challenges in the next decade will involve data – storing it and moving it around (infrastructure issues) and support for the analysis of large-scale datasets (meaning money – apply NASA model of data analysis for NSF facilities?). An ancillary issue is creating and maintaining the ability to share datasets.
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Meeting notes:

Meg Urry presented slides containing Astro2010 charge, etc.

Some comments on slides (primarily from Bob Stein) because programmatic prioritization panels appear to focus entirely on observatories/telescopes and neglect theory/computation. Urry clarified that theory would be represented heavily in the actual science panels (theorists are proportionally over-represented on the panels).

Urry – EPO and Int'l/Private partnerships will be critical in the next decade. EPO b/c we need public goodwill, particularly in times of financial turmoil, and private partnerships because various ground-based telescopes are private, and space-based telescopes are often international (also big 30ish-meter telescopes, SKA, etc. are int'l).

Jones – asked for clarification about who writes “status of field”-type papers.

Kundu – will funding at an individual researcher scale be discussed in the panel? NASA is friendly to young investigators, NSF is not, so lots of younger people do space-based work because of this. This is a systematic issue because NSF’s treatment of young investigators is inefficient, and it’s bad for people to be funding driven (working on NASA-oriented projects) instead of what they’re truly interested in.

Stein – it’s important for individual observational facilities to support analysis of their data! This came up in the 2000 survey, and hasn’t been addressed yet.

Urry – mentioned report (COMRAA) issued by the National Research Council looking at how astronomy and astrophysics research is organized and managed by NSF and NASA. There was talk at the time about whether the funding should be consolidated in one agency or not. Result of report: no, don’t make such a drastic change, each agency has its strengths and weaknesses and there are benefits to having different agencies and cultures involved. Specifically concerning NSF and large projects, there was also the Brinkman report (*setting Priorities for Large Research Facilities Projects at NSF*) issued by the NRC in early 2004. This kind of issue (NSF MREFC funding of very large projects) is certainly appropriate for a white paper on the state of the profession. (Note: COMRAA = Committee on Organization and Management of Research in Astronomy and Astrophysics, chaired by Norm Augustine, Lockheed Martin, retired)

Donahue: Also remember that DOE is now at the table, it’s a 3rd culture entirely, is different from both NASA and NSF, and is different in how young investigators can get into the funding stream. This is something that the survey should take a look at.

Everyone: expressed concern with DOE funding model, which is probably not good for science (but VERY good for continuity).

Stein: funding from three different agencies is probably good – provides some protection from political winds, etc. Who knows who is going to be up/down at any given point?

Kundu: a real problem is when you want to do cross-cutting work (using N>1 different telescopes, Hubble/Chandra/Spitzer, etc.). There used to be an LTSA (long term space astrophysics program) but this is essentially dead.

Urry: NASA has tried to help theory as much as possible, but it’s hard to maintain since any time this pot of money gets big enough it gets taken and put into other projects. However, mission archival proposals are expanded to include theory – this works, but it isn’t enough, and there are some serious systemic issues (not enough \$ for a postdoc, just enough for a grad student)

Brown, O’Shea: mission archival/theory proposals are great, but only really fund “turn-the-crank” type theory/simulations – in other words, just stuff that’s ready to go, and is directly related to a given mission. They do NOT support more general theoretical projects. This is a concern.

(lots of discussion of computation, but the person typing was involved and couldn't both type and think: upshot, we need to worry about computational resources and ensure that there's enough resources at all scales, from small clusters to very large supercomputers, to address all of our data analysis and simulation needs.)

O'Shea: data mining/dealing with gigantic data sets is going to be very important. Both observation and simulation datasets are growing exponentially, and our ability to deal with them grows roughly linearly.

Stein: also need to worry about producing publicly-available datasets from both observational and theoretical/computational ends.

Kundu: Something to consider for the future is the providing of high-level science products to the community. Hubble has shown this – the basic data products out of Hubble are great, but the higher-level ones are not (calibration issues, etc.) To do this correctly involves a lot of effort and money, and is often shortchanged when building the actual instrument. This will be particularly important with a facility like ALMA, which as an interferometer is hard to produce useful high-level data products for in the first place. Since it's a large national facility, you want lots of people to use it, and extra thought/money needs to go into these data products.

Various: expressed strong agreement with Kundu's point.

Stein: one big infrastructure issue is data transmission. We generate huge amounts of data but can't move it anywhere!

Zepf: feedback from science panels through PPPs (program prioritization panels) is non-trivial – when making decisions about science priorities, ignoring feasibility is insane. BUT, the Science Frontier Panels are not supposed to prioritize programs.

Urry: complementarity between science panels and program prioritization panel. Feasibility is an issue that we need to think about – but, science panels ought to worry about 5, 10, 20 years in the future and let the PPPs assess the timescale appropriate for each activity. Big projects are not one-decade things (Hubble, JWST, for example).

Donahue: dark energy is a good example of something that didn't get much attention early on, but is now huge. Our priorities evolve over time, and also big discoveries (like dark energy) are hard to predict.

Urry: the idea of "discovery areas" in the survey is to find this sort of thing that we might otherwise overlook (an example from the last survey might be dark energy, which was just emerging as the survey committee wrote its report). A unique feature of astronomy is that it tends to move forward by discovery and serendipity, unlike many other areas of science (although this statement does not impress congress/funding agencies/other scientists). For the survey, we can try to generate as much excitement about the stuff we CAN specify, and realize that awesome new stuff will come from "ordinary" facilities that were built to make observations on more focused science questions.

Zepf: difference between astronomy philosophy (serendipitous discovery, release data early) and particle physics philosophy (data stays within large collaboration, is analyzed for years, not as much serendipity, etc.)

Urry: space astronomy started out like HEP (instrument teams, no public releases of data, etc.) but people have moved on (CCDs simple, easy to calibrate – people understand them). Astronomers also maybe underestimate the complexity of HEP experiments, so that's not a terribly fair comparison.

Donahue: The whole LHC community is comparable to the Hubble community, and nearly as many sub-groups. Perhaps the differences are over-estimated?

Urry/Donahue: big differences between astro/HEP communities in terms of commitment to projects, evaluations of projects, how funding works, etc. (long vs. short term commitment, DOE vs. NASA as astrophysics players). Need to figure out how to work together between communities given different approaches.

Kundu: what's the point of the decadal survey? The last one missed the two biggest discoveries of this decade (exoplanets, dark energy). So what justifies this whole gigantic process?

Urry: defended decadal survey as something that congress, NSF/NASA/DOE all want. 2nd purpose is to sell science story as something that's really interesting (this was maybe not done before). "Connecting Quarks with the Cosmos" did a great job of this and helped out tremendously. Panels' job is to make the science exciting. There will need to be public/private and international partnerships to realize our most expensive ambitions. Our community has not yet figured out how to do this.

Kundu: astronomy started off as private parties doing observing. Maybe we're heading back that direction? NOAO is selling off time on telescopes now!

Donahue: one of the payoffs of making data publicly available and easily accessible is that you get a bigger community (X-ray is big, radio is small)

Urry: public facilities are much more expensive to operate than private ones, because of making well-calibrated and documented data widely available.

Zepf: data needs to be broadly useful – people underestimate how much it costs to make this happen, rather than hardware, data, and computation costs. This needs to be considered very carefully in the future. (followup note: people are generally the biggest expense in this situation.)

Stein: having to sell the science is probably the crucial thing for this panel. Funding for science has gone down in real terms in the past few decades, and a general push for more science funding is important. Making it exciting/selling the science can be a HUGE thing for the survey.

Urry: this is right, we all need to take the survey and bring it to our local representatives (not when they're in Washington) and tell them that it is exciting, interesting, etc.

Donahue: need to emphasize to representatives in the context of what it brings to their district – jobs, education of kids, etc.

Urry: our argument is that we attract people to science who then go on to do other things for society. The more exciting the science, the better we can do this. *** **THE SURVEY COMMITTEE SHOULD EMPHASIZE THIS** *** The astro community does create lots of employment (engineers, etc.) and teach lots of people technical things, and this may not always be clear.

Urry: to summarize, a lot of our “not-science” issues (as in, attendant issues relating to people who do science, including infrastructure, publicity, etc.) needs to be talked about a lot more. Please submit white papers!

Attendees (in no particular order):

Deb Haarsma (Calvin College faculty)
Carolyn Peruta (MSU graduate student)
Jennifer Jones (MSU graduate student)
Christopher Waters (MSU postdoc)
Brian O’Shea (MSU faculty)
Ed Loh (MSU faculty)
Bob Stein (MSU emeritus faculty)
Horace Smith (MSU faculty)
Steve Zepf (MSU faculty, Astro2010 panelist)
David Chamulak (MSU graduate student)
Jack Baldwin (MSU faculty)
Megan Donahue (MSU faculty)
Kirk Korista (Western Michigan University faculty)
David Ventimiglia (MSU graduate student)
Meg Urry (Yale faculty, Astro2010 panel chair)
Ed Brown (MSU faculty)
Andrew Steiner (MSU postdoc)
Arunav Kundu (MSU research scientist)