Astro2010 Town Meeting at Indiana University

An Astro2010 Town Meeting was held at Indiana University on March 11, 2009. Attendees included Meg Urry from Yale as well as Physics and Astronomy faculty and graduate students from Indiana University. Professor Mike Sitko from the University of Cincinnati also attended.

Mike Sitko (Cincinnati)
Meg Urry (Yale)
Haldan Cohn
Phyllis Lugger
Andy Bacher
Chuck Horowitz
Con Deliyannis
Tara Angle
Tad Baptista
Tala Monroe
Caty Pilachowski
Randy Hamper
Ryan Maderak
Ted Maxwell
Jessica Windschitl
Jonathan Hargis
Arthur Sugden
Jayce Dowell
Kevin Croxall
Kate Barnes
Heather Jacobson
Steven Janowiecki
Kathy Rhode
Dick Durisen
Liese van Zee
Bob Armstrong
Joe Hughto
Michael Young
Maria Cordero
Stuart Mufson
Nathalie Haurberg

The Town Meeting was chaired by Meg Urry, who is chairing one of subcommittees on science (Galaxies across Cosmic Time) for Astro 2010. She shared a PowerPoint presentation that described the Astro2010 process and opportunities for community input. In response to questions, Urry also described the CAA's extensive review of the previous decadal survey process and various factors that limited its success in the current decade.

Urry reviewed the status of the Survey, including how the science subcommittees, the program prioritization panels, and the state of the profession study groups will work.

Following this introduction we began with questions, comments, and discussion.

Question – An important local concern is the goals of ReSTAR. How will the ReSTAR report factor into the decadal survey? Will the goals of ReSTAR b lost in the noise of big projects?

> The decadal survey committees are receiving input from many studies, and Astro2010 has created a reading list, which includes not only the ReSTAR report, but also the ALTAIR report. Urry also noted that Roger Blandford, who is chairing the Astro2010 effort, also chaired the NSF Senior Review two years ago. At that time, the SE heard from many people who felt their views had not been

heard in the previous decadal survey, and that that survey did not address the balance needed between large and smaller facilities. Everyone understands need to educate students, to sustain a healthy community, and to carry out the important science that can be done on smaller telescopes.

Question – The decadal survey is good at laying our priorities for big projects, but we have invested a huge amount in new facilities in the last decade or two. What we need now is instrumentation to make that investment more productive. Investing in instrumentation is not a big budget item, but it can have huge impact. How can we plan big projects and move them forward, while still taking advantage of investment that has already been made?

This is a good topic for a white paper. Also note that TSIP has been a success – and that Gemini needs instruments, too.

Question – Are the "state of the profession" study groups relying on what comes in on white papers? Or are they collecting data from other sources and checking facts? How will they address issues like the "two-body problem?" And how will the study groups get the data they need?

The two-body problem is another good topic for a white paper. White papers do not have to be long – even a short statement drawing attention to this issue would be very useful. People are selected to serve on the panels to cover a breadth of issues, and who are knowledgeable. The panels will seek out additional information as needed, and are allowed to import other experts if needed.

The most useful science white papers are those that looked in detail at particular science questions and described possible approaches for answering it. Many of the science white papers were repackaged proposals, and those will be useful in later stages of the process.

Some information on demographics can be mined from the AAS member database, but getting demographic data is not easy.

Question – What happens when the survey is over? How is it used and how does it influence funding?

Astronomy pioneered the decadal survey process, beginning in 1970. Decadal reports have been a powerful influence on federal agencies and the Congress. They have determined what NASA and NSF have decided to do and what the Congress has funded. The final report is distributed and widely read. Congress asks for it, and congressional staff are very up to speed on survey recommendations. The chair of survey also visits congressional offices and briefs Members and their staffs.

Other fields have copied Astronomy and now also produce their own decadal survey reports. For example, Earth Science did one two years ago, and they got a big bump in the stimulus bill.

Our process this time is more complicated and people-intensive than in other fields. Some 300 people are involved. In contrast other physics surveys involved of order 20 people.

When the report comes out, read it, talk to your congressional representatives about it. Try to talk to them here at home in their local office. Bring the report and advocate for what you want to see. Please do not advocate against anything. (Caty: Just remember that you don't represent the university, you represent yourself!)

Question – Where do the national observatories sit? How much emphasis is put on repair and resuscitation of national facilities compared to new projects?

NOAO and NRAO are funded by the NSF. Many advisory committees have told the NSF to protect research grants. Over the years, NSF Astronomy funding has gone up, and has just about doubled in the last decade. But the number of astronomers has also grown, the number of telescopes has grown, and the need for instruments at non-federal telescopes has also grown, putting a lot of pressure on funding. How decisions are made on the relative value of facilities and grants was recognized as critical in 2000, and is now even more critical. The Senior Review attempted to help define the balance. It is a hard question: what do we stop doing to do new things?

Question – Is there a safeguard in the process to prevent or minimize one project sniping against another? How will the survey panel address the relative prioritization of a 30m telescope vs. Kitt Peak.

The priorities have to be driven by several factors, certainly by the science but also the health of the profession and the need to educate the next generation. If you think national facilities are underfunded, tell the committee.

On the question of "sniping" it is useful to define what each project can do more effectively than other projects, and what niche that project will support. It is not useful to criticize other projects.

Question – How is economic downturn affecting priorities?

We don't know yet. All panels will be given a budget guideline for planning, and this is typically a flat budget. The report should also address what could be done with an increase in funding.

Question - Is anyone seriously tracking health and flow of postdocs? Typical theory budgets, for example, are not sufficient to support a postdoc.

> Postdocs can fall in the cracks. Even at universities, graduate students and faculty have well defined roles, but postdocs are usually tracked/mentored by only one faculty member. This is a tough year to be a postdoc. Many searches have been cancelled. As a field, we generate 200 new Ph.D.'s each year, and the number of postdocs are comparable. But this year there has been a big drop in number of faculty positions open.
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> The number of "free postdocs" - Hubbles, Jansky Fellowships, Institutional postdoctoral fellowships, etc, number about 50 per year. The rest of the postdoctoral positions are grant funded. Astronomy is unusual in having so many unrestricted postdoctoral fellowships. We have so many in part because NASA recognized the need to be sure we have enough people to reduce the data from big missions.

Comment – Astronomy differs from other fields in that there is a feeling that if someone leaves the field, they can't get back in. This is not so much the case in other fields. Write a white paper about different career paths, ability to get on/off track.

Question – Mission planning seems haphazard, more driven by launch vehicle availability than by science priorities. Is anyone talking about keeping NASA missions/launches on a more regular cycle? Or about avoiding a boom-bust cycle driven by launch schedules?

> Explorer missions are more nimble, and people talk about the importance of Explorer missions, but we're automatically in a boom/bust cycle anyway because we can't keep many projects going at once. Explorers are expensive enough and used by so many different fields, that any one field will be subject to a boom/bust cycle. Ballooning or rockets may be the avenue today to sustain fields over time and to maintain the people who do the hardware. Write a white paper!

Question – There is also the need to balance niche science instruments vs generalized, workhorse instruments. How do you balance broad community interest versus single-experiment projects?

> Some key science questions will drive facilities that will be useful for many other science questions. Those are good choices. Choices need to be driven by science. The Senior Review report said that telescopes of every aperture can do forefront science.

Question – ALMA is not perceived as broader community activity. Do we have the expertise in the community to use ALMA effectively?

Students today are more multi-wavelength, techniques at different wavelengths have become more accessible, and the science we want to do requires observations at more wavelengths. The ALMA science case is persuasive. People should read it.

Comment – National facilities are getting better at making telescopes at different wavelengths more accessible to astronomers. One doesn't have to be a "black belt" IR astronomer to use Spitzer.

Question – With 300 people involved, and over 6000 astronomers, how do that many people make decisions on priorities?

The survey needs people who will think deeply and really make an effort to consider the science and the needs of the community. Panelists need to be experts, and give different points of view a fair hearing, rather than just advocating for what they themselves are doing. There are stages and steps to gather and refine input, and the Survey Committee will have to digest it all.

Question – Will the decadal survey affect the distribution of funding for grants in different fields? For example, are computation and modeling getting less and less funding because they are not tied to a big project?

Computation lately is getting new funding. NSF, NASA, and DOE all fund computation differently. The DOE funds projects on long time scales, usually through long term contracts that get reviewed every few years. That is changing now, and it is unclear how the new system will work. NASA reviews programs in broad categories, but in a mission specific way. Panels will need to decide if there are useful recommendations they can make about funding areas like computation, modeling, theory, and laboratory astrophysics. The COMRAA report took a look at this issue. It is clear that the health of funding at one agency has impacts on the other agencies, too.

Comment – Students need more opportunities to work on instrumentation and we need to encourage students to work on instrumentation.

It's interesting to note that Physics already gets this. Instrumentalists are hired into faculty positions and are evaluated for the instrumental skill. In astronomy, people with hardware ability are in demand, but science and hardware are less connected. In astronomy we judge people on science papers, not on instrument expertise.

Question – What role will the decadal survey plan in education for the general public?

This is really important, and public outreach is relatively easy in astronomy. Public appreciation for astronomy is strong; still, it may be considered a luxury, like art, nice but not necessary. We need to bring the broader value of astronomy

into the discussion, stressing the more practical benefits… astronomy is a great attractor of kids to science. Astronomy pushes technology. And we train people in science and technology who go on to do other things.

Comment – We need to show why astronomy is relevant, we see many students who cannot articulate why astronomy important to society. Looking through telescopes is cool, but spending a lot of money is not. It also helps to compare spending in astronomy with other things we spend our money on.

Question – How does spending for EPO compare in importance to spending for research and facilities. It's hard to find funding for science education in K-12 schools.

Most astronomers understand how vital EPO is to what we want to do. An oft-stated goal is to allocate 1% for EPO in every mission. That's a healthy number. Every grant can get a supplement for EPO. Partnering with schools, museums, etc. is relatively small amounts provides relatively small amounts, but $5K is a lot of money for teachers. We should take advantage of partnerships with teachers. But those partnerships are hard to create and sustain. The survey committee needs to think about how to prioritize these kinds of activities.

Question – Can you speak about the lessons learned from the 2000 Survey?

The CAA studied the previous survey for two years, and made a long list of reasons why the 2000 survey was less successful. The science story wasn't emphasized, unlike the Quarks to the Cosmos report (2002), which was widely read and appreciated. Unrealistically low cost estimates and a too-ambitious list of projects were also problems. (This was in part to correct for a too-short list from the 1990 survey.) And the budget that was assumed was too optimistic, and didn't figure in the cost of what we were doing already and must continue to do.

We also have to consider international and public-private partnerships. We do them, but haven't solved how to do international projects well. Public-private partnerships are even harder. Operations costs will quickly (5-10 years) dominate construction costs, so we need to learn how to balance needs of both the public and the private sectors as the partnership is formed. When one institution receives $800M of private funds, it's very hard to give up the control that would be appropriate for public operation of a new facility with comparable public investment.