

SEUS Closeout 2004; Enter Universe 2005

by Charles Dermer

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As far as I can tell, SEUS and OS were dissolved November 9th following the final SEUS/OS meeting at the Inn and Conference Center, University of Maryland, College Park. There were, however, no formal announcements or ceremonies to mark its end (and, by chance, the end of my tenure as a SEUS member). There were, however, presentations by the BE Vision Mission leads, and discussion of Strategic Goal #4: Terrestrial-Like Planets, and Strategic Goal #8, The Origin, Evolution, Structure and Destiny of the Universe. These presentations should be posted on a [website](#), though they have not appeared at the time of writing.

Within the context of the reorganization, NASA must still follow federal guidelines, of which one is to file a strategic report for the agency. The NASA Strategic Planning Document, headed by Dr. Charles Elachi, is composed of 12 or 13 separate docs summarizing the roadmaps for each of the agency level objectives, of which there are—according to my notes—18. Senior scientists will integrate the Strategic Roadmap. This will be performed by NASA and is not a community process. The separate OS and SEUS roadmaps will now be combined into a single Universe roadmap.

As reported by Dr. Adam Burrows (UAz) at the San Diego AAS, The Universe's Legacy Roadmap is a 100 page gloss on the Universe's strategic planning doc that feeds into the NASA SPD. "The Roadmap is to lay stress on broad science and exploration goals, ...with a scientific mission suite, ...not a grabbing..., and ...will succeed." "We have to make sure that science does not fall through the cracks."

As explained at the San Diego AAS by Dr. Eric Smith (NASA HQ), the NASA roadmapping process for the Universe Division is divided into the Search for Earthlike Planets Strategic Roadmap Committee (SEPSRC), composed of Dr. Ghassem Asrar (NASA HQ), Dr. Chas. Beichman (JPL), and Prof. A. Burrows (UAZ). The co-leads are E. Smith and R. Capps. The Universe Exploration SRC (UESRC) is composed of Dr. Anne Kinney (NASA HQ), Dr. Nick White (GSFC) and Dr. Kathryn Flanagan (MIT). The co-leads of UESRC are Dr. M. Salamon (NASA HQ) and R. Capps.

The Universe Division Roadmap, i.e., the Legacy Roadmap, requests input by February 11th to Michael Salamon and Eric Smith. It may not be clear, however, how one is supposed to get a copy of the draft Legacy Roadmap doc in order to provide informed input. (Even though I am not a member of the Roadmap Team—at least my name didn't show up on Eric Smith's chart—I do have a copy of it.)

I will synthesize my impressions of both the November and January 2005 AAS meeting to save both of us time.

Sean O’Keefe resigns effective Feb. 15th, and the wish is for his successor to be in place and confirmed by then, though it seems unlikely for that to happen so quickly. The major decisions awaiting the new NASA Administrator are HST reserivicing and return to flight. Given the recommendations of the NAS-commissioned “*Assessment of Options for Extending the Life of the Hubble Space Telescope*” (aka the Lanzerotti report), sending a Shuttle-repair mission to service HST is “worth the risk.” Given the public support for HST reserivicing, it seems that the agency must bow to public opinion on a technical issue. This is where Sean O’Keefe seems to have stumbled, by erring in the direction of safety. Given that the probability of catastrophic shuttle failure is a percent or two (see previous posts), these are the odds that the astronomy community is risking to rescue an aging workhorse at the expense of newly developed thoroughbreds.

I personally am not in favor of risking shuttle astronauts on science, even as great as Hubble’s is and as persuasive as the arguments of Bruce Margon are. I acknowledge that HST provides great science and the Hubble images are breathtaking.

But also are the images delivered by the Chandra X-ray Observatory. The highlight of the San Diego AAS was for me the Rossi Prize Lecture delivered by Drs. Martin Weiskopf (MSFC) and Harvey Tananbaum (SAO). Harvey likes to mix interpretation with observation, so I tried to persuade him later that the extended Chandra jet X-ray emission is unlikely to be Compton-scattered CMB interpretation because of the demanding energy and power requirements. Dr. Tananbaum also had interesting numbers on the Eddington ratio and Bondi-Hoyle powers from accretion of the diffuse gas onto the ~ 3 million Solar mass at the center of our galaxy. An interesting question is whether the resolved Sgr A* quiescent ($\sim 10^{33}$ ergs/s) emission has thermal properties (i.e., lines). I hope that the Rossi prize lecture is posted—a great overview of a great mission. Congratulations, Martin and Harvey!

In addition, we also have the wonderful Galex and Spitzer images and science.

Other good talks (or talks I attended) at the San Diego AAS included a prize lecture by Martin Rees on “Scanning Cosmological Horizons,” the Exist and Swift talks, where Shri Kulkarni made a guest appearance (apparently answering his challenge at the Peter Meszaros/Swift PSU workshop wheter Swift is with CalTech) and gave, as usual, a great talk in the Swift session (still not yet up on his website).

On behalf of Armen Atoyan, I introduced our [black-hole plerion](#) concept at the first contributed (parallel) oral session of the conference, and talked with Prof. Fulvio Melia (UAz) and his colleagues. We for the most part agree regarding a second-order accelerator in the galactic center corona/ADAF. I find, in discussions with Dr. Siming Liu (Stanford), a very clear distinction between second-order (synchrotron/SSC) and $2^{\text{nd}} + 1^{\text{st}}$ (relativistic Maxwellian synchrotron + power-law synchrotron). I talked with Dr. S. Markoff (MIT) about emission components of a galactic binary black-hole with jets.

The basic state of uncertainty that permeates NASA space science is due to the uncertain fiscal horizon. Because this budgetary situation continually evolves, it is not possible to answer directly about the nature and progress of some of the government programs.

With this background in mind, I framed a question to Dr. Ghassem Asrar at the NASA Town Meeting on Monday, who was introduced by Dr. Paul Hertz (NASA HQ). Paul also talked about NASA realities later that evening. My question was:

“Scientists who inhabit the Universe feel the effects of NASA reorganization. For us scientists in the universe beyond Pluto [originally: the Kuiper Belt], there used to be 2 out of 4 homes in NASA space science, that is, Seuss and Oz [out of SEC and Planetary]. Now there is just one-third: the Universe [out of Universe, Solar System, and Earth-Sun].

“I understand that politics is choosing, and in the choosing there are winners and losers. But it seems that the Explorer Program and Beyond Einstein are not faring well in the present budget environment.

“This leads to a number of interconnected questions:

- Should the astronomy community try to reach out to the public for support of the Beyond Einstein program?
- For the astronomy community, Does the astronomy community really support the Beyond Einstein program, given the astro-niches that we all inhabit?; and finally
- Where are these programs going under yourself and Al Diaz?”

Dr. Asrar gave a cogent answer ending with “...join forces and make it happen.” I had the good fortune to speak with Dr. Asrar later that day. He had some interesting data on the Dec. 26th tsunami taken, as I recall, with an EOS satellite. Dr. Asrar is an Earth scientist. He and Al Diaz strongly support BE and NASA space science. But for NASA policy, budget and not always good science frame the debate.

Regarding the Roadmapping exercise, which is in the hands of Adam Burrows and Kathy Flanagan, there is little to do but repackage and streamline the previous Origins Roadmap and the first major section of the Beyond Einstein Roadmap, and to rewrite the Cycles section. Obviously for instrument builders and detector makers there is much interest in identifying one’s science in the Roadmap and, better still, the instrument. (SAFIR is featured prominently there). After Eric Smith presented at the Wed., Jan 12, Session 126: HEAD II: High Energy Astrophysics and the NASA Roadmap, the session went over to some highlighted missions (mostly vision missions), and was adjourned before any public comments could be made. Dr. Cornelia Wunderer (UCB) gave a nice talk on a Laue lens for gamma-ray astronomy and its modest pointing requirements, and Dr. Webster Cash (UC) talked about a novel pinhole planetary finder concept. I did ask Eric what the budget was for the instruments concept that we were about to hear about. Eric answered that there was no budget, but the purpose of appearing in the Roadmap was to begin the process where a mission could be funded.

One of the points I hoped to make was that I disliked the organization of the Roadmap: I thought it should start with planetary formation and the President's Vision for Space Exploration, and work its way up to the grandeur of Beyond Einstein. Because there was not time for public discussion, I was not able to ask this question.

Well, that's it for my foray into NASA policy through my participation on the SEUS. If they don't ask me to do anything for the Roadmap I won't volunteer. I hope you enjoyed and learned something from these posts. I am returning to science now. Here I announce publicly for the first time that I am writing a book with the provisional title of "High Energy Radiation from Black Holes." It bears primarily on cosmic ray, gamma-ray, and high-energy neutrino theoretical analysis (some observational review will appear in the later sections), and will be particularly useful for GLAST and ground-based air Cherenkov telescope gamma-ray analysis. It should be finished in a year.

Finally, just to complete the thread, I also post the [letter](#) I wrote in lieu of a report from the final November 2004 SEUS meeting. The Washington Post declined to publish it. Circumstances could change rendering arguments changing, but at the present I still endorse my own views.

I have been asked to run for Councilor of the Division of Astrophysics. These posts should give you a basis for deciding whether to vote for me. Because the SEUS meetings were open to the public, I felt that it was appropriate to report publicly about them. Should I be elected Councilor, and these meetings are public, I will continue the posts. Don't hesitate to send me an e-mail.

Chuck Dermer

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