Report of the October 2002 Meeting
of the
Astronomy and Physics Working Group

The Astronomy and Physics Working Group met on October 17 and 18 at NASA Headquarters. The following members were present: Ed Cheng, Mark Devlin, Jerry Edelstein, Kathryn Flanagan (Co-chair), Terry Herter, Dick Miller (for the first day), Doug Richstone (Chair), Wilt Sanders, Ted Snow, Tuck Stebbins and Erick Young. The meeting agenda is attached.

The APWG Charter and the focus for this meeting.

The meeting began with a briefing by Jay Frogel on the committee charter and an overview charge for the meeting. We were reminded that our primary function is to serve as a "standing working group" for the Structure and Evolution of the Universe (SEU) and the Origins Subcommittees of SScAC" and to "provide community input on topics and issues related to the formulation and execution of the R&A program." Within that charge there are some specific functions which include providing assistance "on all issues concerning R&A", serving "as a sounding board for R&A policy issues", informing the community of R&A policies, providing community input on R&A issues and organizing ad-hoc working groups or workshops when needed.

The focus of this particular meeting was to provide assistance on R&A. We were asked to address two questions in particular as follows. What is missing from the present R&A program? What criteria should be used for rebalancing the R&A program? These issues were the subject of extensive discussions with the discipline scientists and are addressed below.

Reports from Laboratory Astrophysics Workshop and Long Wavelength Detector Working Group

The committee received the "Laboratory Astrophysics White Paper" (Ted Snow, editor), a summary of lab astro needs prepared by the SOC of the Laboratory Astrophysics Workshop held at NASA/ARC in May 2002, and also "Detector Needs for Long Wavelength Astrophysics", a June 2002 report from the Infrared, Submillimeter, and Millimeter Detector Working Group (Erick Young, chair). The APWG commends both groups for their efforts. We draw attention to a key recommendation of the second WG below in the discussion of the gaps in the R&A program.

The primary finding of the lab astro workshop is that lab astro needs are increasing but resources to meet these needs are lacking. The report argues that there are more current and future missions that need lab astro data, and their needs, particularly in high-resolution spectroscopy, exceed the lab astro data that are currently available or can be expected to become available. A second concern was the availability of funding to support databases containing basic atomic and molecular data available on-line.

Sustaining these laboratory activities and databases may be a future problem since much of this activity is no longer supported by NIST.

Because these activities benefit work supported by other agencies as well as NASA, the question of how they should be supported should be considered at a higher level, perhaps by the NAAAC.

Balance in the R&A Program.

The committee received several briefings on the Research and Analysis (R&A) program from Jay Frogel, Michael Salamon, and Jeff Hayes. In addition we were briefed on the technology program by Harley Thronson and Chris Moore (Code R). These briefings engendered an extensive discussion between the committee members and the briefers and discipline scientists regarding issues of balance in the R&A programs.

The APWG applauds the efforts of the Discipline Scientists to achieve a balanced science program. We feel that they have a sound sense of priorities for balancing the program across fields and found little, if anything, to disagree with. The Discipline Scientists attempt to balance the R&A science program by considering a combination of (i) intrinsic scientific merit, (ii) programmatic needs (based on the programs in the OSS Strategic Plan and the Theme Roadmaps) and (iii) proposal pressure. We and they agree that long-term scientific productivity is an element of intrinsic merit, particularly for continuation proposals. We think that it should be specifically mentioned in future NRAs as a selection criterion for proposals that continue a program spanning several funding cycles. The APWG believes that the numbered criteria should be weighted in the order listed above (and we think that is in fact what is being done).

The APWG requests that the two FACA committees to which it reports (SEUS and OS) note the comments on R&A program balance described above, and consider formally endorsing them.

The LTSA Junior Set-aside

One aspect of the program did concern the committee. Within the LTSA program there is a substantial set-aside of funds for scientists who have only recently obtained PhDs. The record of junior LTSA recipients does not generally reflect this investment (a study by David Helfand notes that junior LTSA recipients are not more likely to win tenure-track positions, or tenure, than others). APWG believes that there is no need for a set-aside to protect junior competitors for these awards since they win a fraction comparable to the set-aside, and that a set-aside in this case may well be counterproductive.

Closeout funding.

In the course of the discussion of the program we reprised the discussion of closeout funding that occurred during our previous meeting. We repeat our views of this issue below.

"The APWG recognizes the importance of the long term investment in established efforts. In those cases where the abrupt termination of a program will lead to the immediate, irretrievable loss of a critical capability, the APWG recommends that those programs be considered for one year reduced "bridge" funding. This funding is intended to allow the groups to re-apply for funding with the hope of preserving this capability. Such funding should be at the discretion of the discipline scientists balancing the cost of the loss of the capability with the potential gain of funding a new initiative or new investigators.

"We suspect that the balance between maintaining specific capabilities and encouraging new investigations is somewhat more favorable to the former in the technology areas, and somewhat more favorable to the latter in the more theoretical areas. "

Gaps in the R&A Program

In addition to considering the balance in the R&A program we considered whether there were any gaps in the program. This discussion reinforced a point made in the Long Wavelength Detector report. Both Code R and the SAPRA programs support technology development at a low technology readiness level (TRL), generally a TRL of 3 or less. Proposals funded under the Explorer Program tend to be downgraded in competition if they rely on technology that is not mature (a TRL less than 6).

In practical terms, most funding to improve potentially useful technologies from level 4 up to level 6 is technology funding within large (flagship) missions. We believe that this "TRL gap" is depriving NASA of useful technologies that stagnate at TRL=3 unless their development happens to be picked up by flagship missions (we note that in principle the New Millennium program offers flight opportunities for these purposes, but there is nonetheless a problem perceived widely in the community). Many of these immature technologies might enable a more aggressive Explorer Program and would produce a richer technology heritage for future missions of all costs.

After our meeting, the chair and co-chair heard similar discussions of a "TRL gap" in solar system programs. We urge the SEUS and OS to consider advancing this issue for discussion by the SSAC, since it is possible that this should be looked at across all of Code S.

Code R support for OSS Technology Needs

Turning to the more general issue of the effectiveness for OSS of the Code R technology programs, we first wish to record our appreciation for the briefing provided by Chris Young, and for the open discussion that occurred during our meeting. We were told that there is an increasing effort in Code R to support the technology development required by mission concepts identified in the Code S strategic plan, especially those which do not yet have substantial technology funding.

We note that Code R is considering creating more frequent (possibly annual) and more targeted proposal opportunities based on the technology needs described in and implied by the OSS Strategic Plan and Theme Roadmaps. They are also considering incorporating experts from the space science community on their review panels. We thought this was a very sensible way to proceed. The one issue where the relationship between Code R and the OSS strategic plan seemed less than ideal is the communication of components of the OSS plan to the Code R people. This process does not appear to have well-developed formal procedures that work. This problem is somewhat palliated by the fact that Code R people seem to actually read the Code S strategic plan. We also encourage the support of exceptionally promising technologies not targeted for specific mission concepts.