National Astronomy and Astrophysics Advisory Committee (NAAAC)

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Background

- From the NSF section of the Bush administration's Feb. 28, 2001 FY 2002 budget summary:
  - "Several changes have evolved which suggest that now is the time to assess the federal Government's management and organization of astronomical research. NSF and NASA will establish a Blue Ribbon Panel to assess the organizational effectiveness of Federal support of astronomical sciences and, specifically, the pros and cons of transferring NSF's astronomy responsibilities to NASA. The panel may also develop alternative options."

Committee on Organization and Management of Research in Astronomy and Astrophysics (COMRAA) Conclusions

- There are barriers between NSF and NASA that are detrimental to the future of astronomy.
- There is inadequate coordination between NSF and NASA.
- Recommend establishment of an "interagency planning board."

- NAAAC was established in 2002 in response COMRAA recommendations.
  - "The interface between ground-based and space-based astronomy should be seamless." Claude Canizares

NAAAC Charter

- On a continuing basis, NAAAC will provide advice upon request to both the National Science Foundation and the National Aeronautics and Space Administration on selected issues within the field of astronomy and astrophysics of mutual interest and concern to the two agencies. Astronomy and Astrophysics is understood to encompass observations and theoretical investigations of astronomical objects and phenomena, including the sun and solar-system bodies.

NAAAC activities will include assessment of and recommendations concerning:

- The identification of gaps and duplication between the two agencies, in research and analysis programs as well as in missions, observatories, facilities, archives, etc.
- Advice on coordinating the development of the strategic plans of the two agencies for astronomy and astrophysics.
- Advice on specific areas which may benefit from coordinated formulation, solicitation of proposals for research and/or hardware development, and financial support.
- In addition, NAAAC will conduct specialized studies when requested by the agencies. These studies will be published as reports, if appropriate.

NAAAC Membership

- Chair: Bob Gehrz (U. Minnesota)
- Alan Dressler (Carnegie Obs.)
- Garth Illingworth (Lick Obs.)
- Jim Klimchuk (NRL), SECAS/Solar, SSES liaison
- Brad Peterson (Ohio State U.), SEUS liaison
- Caty Pilachowsky (Indiana U.)
- Abhijit Saha (NOAO), OS liaison

Current NAAAC Activities

- NAAAC has met once, on 2–3 October 2002
- Currently trying to identify possible areas of cooperation
  - Technology development
  - Student training in instrumentation
  - LSST
  - LISA/LIGO theory support
  - NVO support

Challenges to Cooperation

- Different agency cultures
- Differing budget processes
- Different advisory apparatus
- Lack of parity in budget/size
- Differences in review processes
- Coordination of programs with different goals
- Asymmetric eligibility of grantees/contractors

Some Current and Past NSF and NASA Cooperative Efforts

- 2MASS Infrared Sky Survey
- IRTF operations support and instrument development
- Antarctic meteorite program
- Sloan Digital Sky Survey
- NASA funding of Near Infrared Coronographic Imager (NICI) for use on Gemini telescopes

NAAAC Recommendations

1) Find common ground for collaboration on substantial projects recommended by Decadal Surveys
   - Large Synoptic Survey Telescope (LSST)
   - National Virtual Observatory (NVO)
     - NVO is a top priority
   - James Webb Space Telescope (JWST, formerly NGST)
   - Giant Segmented Mirror Telescope (GSMT)

NAAAC Recommendations

2) NSF Astronomy needs to develop an advisory structure that is more responsive to the community
   - Standing committees similar to SScAC and its subcommittees provide a good model

NAAAC Recommendations

3) A joint NSF/NASA program to fund major initiative in modeling gravitational wave sources.

- Recommendation based on white paper by Task Force for an NSF/NASA Computational Effort in Gravitational Wave Science (Saul Teukolsky, chair)
- Lack of theoretical templates compromises science that can be done with LISA/LIGO
- $5M per year requested
  - 5% capital cost of LISA/LIGO
  - This should not compromise other theoretical efforts funded by NASA/NSF

NAAAC Recommendations

4) Improve coordination of solar physics programs by suitable phasing of ATST and SDO.

- NASA's Solar Dynamics Observatory (SDO)
  - 2007 launch
  - Will study how changes in magnetic fields at and below the solar surface lead to heating and activity in the corona above
- NOAO's Advanced Technology Solar Telescope (ATST)
  - 4-m ground-based facility. Construction 2006-08, operations begin last quarter 2008.
  - Can provide simultaneous measurements of the coronal magnetic fields directly responsible for the heating and activity

NAAAC Recommendations

5) Find those opportunities where a relaxation of the traditional separation between ground-based and space-based astronomy will benefit the broader strategic scientific goals of astronomy.
   - Promotion of collaborations that blend ground- and space-based capabilities can produce joint missions that have enhanced value compared to the value separate missions would have standing alone.

Backup Slides

COMRAA Membership

- Norman R. Augustine, Lockheed Martin Corporation (retired), Chair
- Lewis M. Branscomb, Harvard University
- Claude R. Canizares, MIT
- Sandra M. Faber, U.C. Santa Cruz
- Robert D. Gehrz, University of Minnesota
- Philip R. Goode, New Jersey Institute of Technology
- Burton Richter, Stanford University
- Anneila I. Sargent, Caltech
- Frank H. Shu, U.C. Berkeley
- Maxine F. Singer, Carnegie Institution of Washington
- Robert E. Williams, Space Telescope Science Institute

SDO Science

- Understand the origins and flow of energy from the solar interior, through various regions of the Sun, out to the solar corona. Investigate the Sun's transient and steady state coronal plasma emissions and understand the solar drivers of variability at Earth.

SDO Science

- Identify and characterize the origins of solar variability and characterize and understand the Sun's interior and the various components of magnetic activity
- Understand the magnetic stresses and current systems in the photosphere associated with impulsive events and evolving magnetic structures
- Study the coronal energy storage and release evidenced in rapidly evolving coronal structures over a broad temperature range that are intrinsically tied to the Sun's magnetic field and irradiance variations
- In concert with other anticipated observations of solar irradiance, determine both the short- and long-term variations in the full-disk solar irradiance spectrum that arise in response to changes in the Sun's magnetic field, particularly in the extreme ultraviolet (EUV), and are known to cause changes in the Earth's upper atmosphere

Advanced Technology Solar Telescope (ATST) goals

- To study the ubiquitous weak magnetic field and test models of a turbulent dynamo in the upper convection zone
- To measure waves in magnetic flux tubes and test models of chromospheric and coronal heating
- To measure magnetic fields in the corona