

# Challenges Facing Atmospheric, Earth, and Space Science Departments in Higher Education

BY DONNA J. CHARLEVOIX, EUGENE BIERLY, AND JULIE A. WINKLER

**T**he 15th biennial meeting of the heads and chairs of programs in atmospheric, oceanic, hydrologic, and related sciences was held in the fall of 2006. The intent of these meetings is to provide a forum for heads and chairs to come together to share and discuss experiences, concerns, and trends of broad relevance to university geoscience programs. The 2006 meeting was held jointly between the American Meteorological Society (AMS) and American Geophysical Union (AGU), with sponsorship from the University Corporation for Atmospheric Research (UCAR).

The meeting addressed several contemporary departmental issues and challenges with presentations and breakout sessions. Science presentations provided heads and chairs with a look at new directions in the geosciences. Archives of the meeting presentations are available on the UCAR Web site

## AMS–AGU 15TH HEADS AND CHAIRS MEETING

**WHAT:** Heads, chairs, and administrators of atmospheric and related sciences departments met to discuss contemporary university issues with a focus on research funding of young faculty and the challenge of encouraging and maintaining diversity in the university setting.

**WHEN:** 12–13 October 2006

**WHERE:** Boulder, Colorado

(online at [www.ucar.edu/governance/meetings/oct06/followup/ams.html](http://www.ucar.edu/governance/meetings/oct06/followup/ams.html)).

Rick Anthes (incoming AMS President and UCAR President) welcomed meeting attendees and encouraged everyone, especially those representing minority-serving institutions, to become academic affiliates of UCAR and active members of the community. Anthes also informed attendees that the National Research Council (NRC) decadal study *Earth science and applications from space: Urgent needs and opportunities to serve the nation* was complete. Recommendations from an interim report were incorporated and the final report was released in December 2005. Gene Bierly of AGU described AGU's work in building stronger partners outside of science via their involvement in the American Association for the Advancement of Science (AAAS) Mass Media Science and Engineering Fellows Program and Congressional Science Fellowship. Outgoing AMS President Franco Einaudi [National

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Aeronautics and Space Administration (NASA)] discussed the progress and status of the ongoing AMS strategic planning process. The draft document was available for comment soon after the meeting on the AMS Web site. The AMS Council incorporated member comments and officially adopted the AMS Strategic Goals at the 2007 annual meeting (see information online at [www.ametsoc.org/aboutams/2007strategicgoals.pdf](http://www.ametsoc.org/aboutams/2007strategicgoals.pdf)).

## **DEPARTMENTAL ISSUES AND**

**CHALLENGES.** Representatives from funding agencies discussed the current status of funding and provided a brief outlook of the budget for the coming year. Toby Carlson (The Pennsylvania State University) initiated a dialogue by providing a faculty perspective on funding challenges for young faculty, alluding to the complex nature of promotion and tenure structures within universities. A lively, engaging discussion followed. It was decided that this topic should be revisited at the 2008 meeting and that the issue should be critically examined.

An overview of the demographics of the AMS based on the 2005 member survey was presented by Roman Czujko (American Institute of Physics). Czujko described recent trends in AMS demographics and statistics and compared them to statistics of the broader science community. The small representation of minority atmospheric scientists and the lack of recruitment of minority students was noted. Quinton Williams (Jackson State University) echoed the need for increased diversity. Williams outlined a plan to be developed and acted on that would increase diversity enrollment in degree programs in the atmospheric sciences. During discussions that followed, attendees agreed that a better coupling of university programs with existing external programs to recruit under-represented persons to the geosciences should be a priority.

The role of the AMS in assisting universities with the challenges they face was examined in great length. Keith Seitter (AMS) outlined the role AMS could play in facilitating data exchange, including the sharing of programmatic review documents, through both e-mail and the secure-access portion of the society's Web site. Departmental data could be shared via the AMS Online Curricula. Discussion indicated that the Online Curricula is a vastly important resource for the AMS, UCAR, university departments, and students. Additionally, it was stressed that there should be an ongoing discussion and collaboration between the AMS and universities to make the AMS Online Curricula the premier resource for all uses in

terms of information about university programs and career opportunities in the atmospheric sciences.

Jack Fellows (UCAR) highlighted the ongoing study by the NRC of U.S. research doctorate programs and the importance of the report in documenting the status of departmental programs. This is the first time that the NRC survey has included atmospheric science. Participation in responding to the NRC request for data was encouraged.

An open floor was provided to encourage the discussion of issues not on the agenda. It was agreed that attention should be given to broadening participation in the biennial Heads and Chairs Meeting, ultimately including all departments, funding meeting attendance, and involving more representatives from AGU. Concerns regarding visas for international students were raised, along with suggestions for helping students navigate the visa process, including "becoming knowledgeable" about the regulations, and "being proactive" in terms of assisting students. Participants also asked for more information on student assessment and suggested that this topic be included on the agenda for the 2008 meeting.

## **SESSIONS ON EMERGING SCIENCE FRONTIERS.**

Thursday afternoon presentations focused on advances in the Geographic Information System (GIS) and GPS and the integration of these technologies into the geosciences. Bill Kuo [National Center for Atmospheric Research (NCAR)] discussed the Constellation Observing System for Meteorology, Ionosphere and Climate (COSMIC) project, including the assimilation of COSMIC data into models and the availability of the data on the Web. Mohan Ramamurthy (Unidata) and Olga Wilhelmi (NCAR) argued that the geosciences need to better integrate GIS given its growing interdisciplinary nature and the increasing societal role of weather, climate, and earth science. Charles Meertens (UNAVCO) highlighted the role of GPS in solid earth science, where GPS is utilized as an ultrabroadband motion sensor. The science sessions concluded with a presentation on Friday morning by Alexandra Navrotsky (University of California, Davis) outlining nanotechnology as a useful tool for geoscience research, in terms of exploring complex environmental processes, and arguing that nanoscience is a critical frontier for the geosciences.

**RESOLUTIONS.** At the conclusion of the meeting, resolutions reflecting the most urgent and relevant items discussed were proposed. Four such resolutions

were created and voted on. All passed with a majority vote, including one that was a continuation of a 2004 meeting resolution. They were as follows:

- 1) The AMS and AGU will regularly inform and update heads and chairs regarding society activities, opportunities, and initiatives targeted to students, such as the AMS Minority Fellowship program. Additionally, the heads and chairs will serve as a conduit for informing their communities of such programs.
- 2) The heads and chairs and the AMS Board on Higher Education recommend that the availability and searchability of the current Curricula Guide be enhanced for today's online environment.
- 3) The heads and chairs and the AMS Board on Higher Education recommend that the AMS appoint a committee to improve its Web-based information for students seeking opportunities in higher education in the atmospheric and related sciences.
- 4) The AMS and AGU working jointly will, before the next Heads and Chairs Meeting, collect information, such as planning documents and assessment reports, that would be useful to geosciences departments when presenting their departments and their contextual disciplinary setting to higher administrations (follow up to 2004's resolution 2).

**FEEDBACK.** For the first time, a questionnaire was distributed at the conclusion of the meeting to obtain feedback as well as elicit suggestions for future meetings. In terms of future meeting agendas, attendees gave the highest priority to open time for discussion, followed by discussion of curriculum issues and agency funding. Attendees were least interested in departmental administrative issues being included on future agendas. Close to 90% of the attendees indicated that they plan to attend future Heads and Chairs Meetings. The majority felt that the meetings should continue to be held jointly with the AGU and preferred Boulder, Colorado, as the meeting venue. Numerous suggestions were provided for improving the Heads and Chairs Meeting and will be considered by future planning committees.