Columbia University

Columbia has been a member of UCAR since 2003. There are several departments and affiliated research units engaged in research and instruction in the atmospheric and related sciences at Columbia. These include two traditional academic programs 1) the Department of Earth and Environmental Sciences (DEES) within the Graduate School of Arts and Sciences, 2) the Department of Applied Physics and Applied Mathematics (APAM) within the School of Engineering. Related research is carried out at Lamont-Doherty Earth Observatory (LDEO) and the Goddard Institute for Space Studies (GISS).

LDEO employs 120 Ph.D. level scientists, from post-doctoral through full professor level, in addition they average 80-90 graduate students engaged in thesis-related research. Increasing numbers of undergraduates participate in LDEO summer internships, this summer (2011) there were 32 students involved in research.

The major educational component of the atmospheric and related sciences at Columbia are offered through the Department of Earth and Environmental Sciences (DEES), which shares staff and shared facilities with LDEO, although the amount of overlap is not specified. There are 72 faculty listed on the Department web-site, from lecturer to emeritus in status, and several of these individuals are cross listed not-only with LDEO but also with APAM and/or GISS. Undergraduate majors are offered through Columbia College, and Ph.D. degrees are offered through the Graduate School of Arts and Sciences. Additionally, the DEES offers a terminal Masters degree (M.A.) in Climate and Society.

The number of PhD’s in Ocean and Climate Physics related disciplines from Columbia’s Dept. of Earth and Environmental Sciences since 2003 is 12. There have been 9 MA degrees from DEES. In addition, there have been 10 PhD’s from the NASA Goddard Institute for Space Studies at Columbia University since 2003. There have been 6 MA degrees.

The Department of Applied Physics and Applied Mathematics awards undergraduate and graduate degrees, with studies focused in the fields of applied physics, applied mathematics, and materials science and engineering. Thirty-two faculty, and 23 adjunct faculty are listed on the Department web-site. The graduate program in applied physics includes plasma physics and controlled fusion; solid-state physics; optical and laser physics; medical physics; atmospheric, oceanic, and earth physics; and applied mathematics. No information was provided, nor readily available through embedded links, indicating the number or type of degrees in these programs.

Program of Studies

The university has a deep curriculum, offering on the order of 40 classes in atmospheric and oceanic studies alone. Undergraduate courses are primarily climate oriented, less balanced than
some programs, is squarely within the range of UCAR curricula. Graduate offerings are more
diverse including oceanography as well as climate and a balanced program in atmospheric
science. Research facilities include the combined strengths of GISS, LDEO and the DEES and
APAM programs.

Progress in Atmospheric Sciences

The program continues to produce graduate students, and has increased the number of research
opportunities for undergraduates. No summary was provided on the levels of research funding,
or the productivity of faculty in terms of publications, etc. A list of faculty vitae was provided
late for this review. However, given the numbers of faculty and graduate students, and the
strength of the affiliated programs of GISS and LDEO, it appears that Columbia maintains a
strong program, and is making an important contribution to atmospheric, oceanic, climate and
related sciences.

UCAR Participation

The following information was provided regarding the level of participation by Columbia
faculty, and its affiliated programs faculty, in UCAR governance, collaboration and facilities
usage:

Lorenzo Polvani, Professor, is an Affiliate Scientist with NCAR's Earth System Laboratory
(NESL), and serves as the co-Chair of the Whole Atmosphere Working Group (WAWG) of
NCAR's Community Earth System Model (CESM).

Richard Seager, Palisades Geophysical Institute/Lamont-Doherty Research Professor is a member
of the NOAA Climate and Global Change Postdoctoral Fellowship Committee which is
administered by UCAR.

Adam Sobel, Associate Professor, served on the Steering Committee of the NOAA/UCAR
Global Change Postdoctoral Fellowship Program from 2005-2007, and has been host of a Fellow
in this program (Lei Zhou) since October 2009.

Recommendation

The UCAR Membership Committee concludes that the membership criteria are being met and
recommends to the UCAR Member’s Representatives that the membership of Columbia
University be renewed.