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December 1, 2008

Dr. Hashima Hasan
Explorer Program Scientist, Science Mission Directorate
National Aeronautics and Space Administration
Washington, DC 20546-0001 U.S.A.

Dear Dr. Hasan:

The members of the National Science Foundation's (NSF) Coupling, Energetics and Dynamics of Atmospheric Regions (CEDAR) science steering committee express our enthusiastic support for the Global-scale Observations of the Limb and Disk (GOLD) mission. We strongly approve of NASA's selection of the mission. As will be demonstrated, the GOLD mission science goals complement those of the CEDAR program, adding unique value to resolving grand challenges within upper atmosphere physics.

The NSF CEDAR program is an element of the U.S. Global Change Program which started in 1986 to undertake coordinated collaborative studies of the Earth's upper atmosphere. Its primary objective is to understand the energetic and dynamic processes that determine the composition and structure of the atmosphere above 60 km, particularly how energy, momentum, and chemical processes from the magnetosphere, and those originating in the lower atmosphere, couple to and affect the mesosphere, thermosphere and ionosphere. CEDAR scientific efforts involve researchers, students and technicians, studying aspects of the upper atmosphere and ionosphere through modeling, data analysis and ground based observations.

The CEDAR program has reached the level of icon status and is recognized around the world as the leading forum for upper atmosphere research. In this role, the CEDAR community is preparing its future research plan. The community recognizes the scientific advancements made and the rapidly changing research landscape. This has led the CEDAR community to take on a more holistic view of upper atmosphere processes. It is the vision of the CEDAR community that the physics and chemistry of the upper atmosphere be fully integrated with the response and evolution of the whole sun-earth system. Grand challenges within CEDAR are to address questions such as: What makes a planet habitable, variable and sustainable? and How does the sun-earth system influence our space-reliant society?

Resources on the ground and in space will be required to meet these challenges. The GOLD UV imager, with its global-scale measurements of daytime thermosphere temperature and composition and nighttime electron density from geostationary orbit, is precisely what is needed to advance the CEDAR mission and it will be greatly valued by the entire upper atmosphere community. The GOLD measurements will strongly complement the measurement suite of the ground-based CEDAR community and provide a new data set to constrain modeling efforts. The CEDAR program is an integral part of the National Space Weather Program (NSWP) and the unique vantage point afforded by the geostationary position of the GOLD UV imager over North America will enable continuous unprecedented study of geomagnetic storms and solar effects on the upper atmosphere. This mission will thus provide critical information on the large-scale context of observations made by the CEDAR community. GOLD will be the premier satellite mission for advancing our understanding of the fundamental drivers of the thermosphere and ionosphere and to advancing models of the space environment. It signifies the only thermosphere and ionosphere mission within NASA's missions of opportunity.

The GOLD mission's imager is expected to begin observations in 2014 from geostationary orbit. The NSF, through the CEDAR program and the facilities supported, anticipates performing a wide range of activities around the GOLD research program including provision of complementary data, analysis, and modeling efforts. Most of the ground based facilities and observatories supported by NSF are in the Americas (e.g., major facilities at Millstone Hill Observatory, Massachusetts, Arecibo Observatory, Puerto Rico, Jicamarca Observatory, Peru, and distributed instrumentation such as the Low-Latitude Ionospheric Sensor Network in South America) making them ideal for coincident observations with GOLD. The CEDAR program anticipates conducting observing campaigns in coordination with the GOLD mission with the aim of increasing the value of the science product and enabling a wider program of research on the global-scale response of the thermosphere and ionosphere to forcing in the integrated Sun-Earth system.

The CEDAR Science Steering Committee requests that the benefits of GOLD to the atmospheric and space science community worldwide be given substantial weight as decisions are made with regard to the future of this mission.

Sincerely,

A handwritten signature in black ink, appearing to read "Jeffrey P. Thayer". The signature is fluid and cursive, with the first name "Jeffrey" being the most prominent part.

Jeffrey P. Thayer, Ph.D., Professor, Aerospace Engineering Sciences Department
CEDAR Science Steering Committee Chair
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Concurring Committee Members:

Dr. Bill Bristow, Geophysical Institute, Alaska; **Mr. Jonathon Fentzke**, University of Colorado, **Dr. Larisa Goncharenko** MIT, Haystack Observatory; **Dr. Joseph Huba**, Naval Research Laboratory; **Dr. Diego Janches**, Colorado Research Associates; **Dr. Hanli Liu**, NCAR; **Mr. Marco Milla**, Univ. Illinois Urbana-Champaign; **Dr. John Noto**, Scientific Solutions Incorporated; **Dr. Meers Oppenheim**, Boston University; **Dr. John Plane**; University of Leeds, England; **Dr. Mike Ruohoniemi**, Virginia Tech; **Dr. Susan Skone**, University of Calgary, Canada; **Dr. Lara Waldrop**, Univ. of Illinois Urbana-Champaign