NATIONAL SCIENCE FOUNDATION
4201 WILSON BOULEVARD
ARLINGTON, VIRGINIA 22230

Subject: Proposals Relating to Space Weather Research

Dear Colleague:

The Upper Atmosphere Research Section of the Division of Atmospheric Sciences of the National Science Foundation (NSF), in coordination with the Air Force Office of Scientific Research (AFOSR) and the Office of Naval Research (ONR), is accepting proposals for basic research related to space weather. "Space weather" refers to conditions on the sun and in the solar wind, magnetosphere, ionosphere, and thermosphere that can influence the performance and reliability of space-borne and ground-based technological systems, and can endanger human life or health. Adverse conditions in the space environment can cause disruption of satellite operations, communications, navigation, and electric power distribution grids, leading to broad socio-economic losses.

Proposals should benefit and advance the National Space Weather Program (NSWP), a multi-agency federal program whose goal is to mitigate the adverse effects of space weather by providing timely, accurate, and reliable space environment observations, specifications, and forecasts. Information about the NSWP can be obtained from the National Space Weather Program Strategic Plan and Implementation Plan. Both of these documents are available online through the Office of the Federal Coordinator for Meteorology at http://www.ofcm.gov/homepage/text/pubs.htm.

An effective National Space Weather Program requires a strong commitment to basic research in many areas of space-related science, including studies of the sun, the solar wind and interplanetary medium, the magnetosphere, the ionosphere, and the upper atmosphere. Initial emphasis will be on understanding the fundamental physical processes that affect the state of the sun, magnetosphere, ionosphere, and atmosphere, focusing on answering research questions that will improve the ability to specify and predict conditions in the space environment. Although any proposal meeting the above criteria will be considered, several basic research areas represent significant gaps in our present understanding and need to be addressed early in the Program:

- understanding and prediction of processes affecting solar activity, such as coronal mass ejections (CME's) and solar flares;
- coupling between the solar wind and the magnetosphere;
- the origin and energization of magnetospheric plasma;
- the triggering and temporal evolution of substorms and storms;
- improved global ionospheric specification and forecast and the evolution of ionospheric irregularities, including the onset of low latitude ionospheric irregularities, with particular emphasis on those processes affecting communication and navigation systems;
- improved specification of thermospheric dynamics and neutral densities, and;
- validation and enhancement of ionospheric and magnetospheric models, including data assimilation techniques, to improve operational forecasting and specification capabilities.

Special consideration will be given to research which holds the promise for improving operational space weather capabilities within five years.

Proposals should be prepared and submitted in accordance with the *Grant Proposal Guide* (NSF 98-2), which can be obtained online at http://www.nsf.gov. Proposals should arrive at NSF **no later than September 1, 1998**, in order to be considered for the FY 1999 review cycle and should be submitted to NSF's Aeronomy, Magnetospheric Physics, or Solar Terrestrial Research Programs, as appropriate. All proposal titles should begin with the words: "Space Weather." Funding may be requested for up to three years.

The total amount of funding for this effort is anticipated to be $2.0 million, pending availability of funds. Between 20 and 30 awards are expected, each averaging $50,000 to $100,000 per year for up to three years.

Proposals will be reviewed under standard NSF procedures per the NSF Grant Proposal Guide. In addition to the regular NSF review criteria, reviewers will be asked to place equal weight on the potential of the proposal to advance the objectives of the NSWP. Award decisions will be coordinated with representatives from AFOSR and ONR.

Further information may be obtained from:
Dr. S. Basu (sbasu@nsf.gov; 703-306-1529) Aeronomy Program,
Dr. K. Baker (kbaker@nsf.gov; 703-306-1519) Magnetospheric Physics Program
Dr. K. Schatten (kschatte@nsf.gov; 703-306-1530) Solar Terrestrial Research Program.

Sincerely,

Richard A. Behnke
Head
Upper Atmosphere Research Section

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