AMERICAN ASTRONOMICAL SOCIETY

March 13, 2026

Subject: Response to DCL: NSF Intent to Restructure Critical Weather Infrastructure

Dear National Science Foundation leadership,

On behalf of the 8,500 members of the American Astronomical Society (AAS), I am writing to provide input regarding the Dear Colleague Letter (DCL) titled "NSF Intent to Restructure Critical Weather Infrastructure." As the NSF assesses the current science infrastructure at the National Center for Atmospheric Research (NCAR), the AAS wants to underscore that NCAR supports irreplaceable assets for modeling planetary atmospheres and understanding and forecasting space weather. Any divestment or fragmentation of NCAR's core capabilities threatens the integrity of our nation's atmospheric and space weather research, modeling, and forecasting capabilities, and therefore should not be pursued.

The ability to forecast and hence mitigate space weather events is a matter of national security and economic resilience. As stated in the National Space Weather Strategy and Action Plan[1] released by the White House National Science and Technology Council in 2019, "extreme weather space events can degrade or damage critical infrastructures, which may result in direct or cascading failures across key services such as electric power communications, water supply, healthcare, and transportation." NCAR's High Altitude Observatory (HAO) is the nation's premier institution for research in this area, providing essential Sun-to-Earth modeling that bridges solar physics and terrestrial atmospheric science. Additionally, the continued restoration and operation of Mauna Loa Solar Observatory (MLSO), one of the few ground-based sites capable of coronal observation, is vital. MLSO's Coronal Solar Magnetism Observatory (COSMO) K-Coronagraph instrument provides timely warnings of Earth-bound Coronal Mass Ejections, energetic events capable of inflicting considerable damage to our communications infrastructure, and it can issue such warnings nearly 20 minutes faster than those based on observations from space-based coronagraphs. These physical assets, combined with community models like the Whole Atmosphere Community Climate Model (WACCM-X) and the Thermosphere-Ionosphere-Electrodynamics General Circulation Model (TIEGCM), form a unique, integrated ecosystem that is critical to maintaining our national readiness for adverse space weather events.

NCAR's models of the Earth's atmosphere also provide critical scaffolding for models of the atmospheres of other planets in and beyond our own solar system, which are used by AAS members in their research. Examples include general circulation models (GCMs) for Mars and

[1] White House National Science and Technology Council (2019): "National Space Weather Strategy and Action Plan"

Venus established on the foundation of the NCAR Community Atmosphere Model (CAM),[2,3] and ExoCAM,[4] a branch of the NCAR Community Earth System Model (CESM) that supports the modelling of terrestrial exoplanet atmospheres. Here too, the integration of atmospheric measurement and sophisticated model development within the same organization strengthens the scientific foundation for research on (exo)planetary atmospheres and makes NCAR more than the sum of its parts.

The integrated management of atmospheric and space weather research and infrastructure at NCAR provides a unique synergy between the underlying scientific understanding and national security needs; such a synergistic approach to time-critical event forecasting cannot be replicated in a fragmented environment. Therefore, the AAS urges the NSF to prioritize the retention of these core atmospheric and heliophysics programs and their associated infrastructure within a unified, research-focused framework.

With the recent reorganization at NSF, we also want to see NCAR continue to serve all relevant disciplines within the Directorate for Geosciences and the Directorate of Mathematical and Physical Sciences. In consequence, we endorse the responses to this DCL from the AAS Solar Physics Division, the American Geophysical Union, the American Meteorological Society, and the Geological Society of America.

We look forward to continuing this dialogue to ensure the U.S. remains at the forefront of atmospheric and space weather research and protection. If the AAS can help provide any more information, please do not hesitate to reach out.

Sincerely,

Dara Norman, PhD
President, American Astronomical Society
public.policy@aas.org

---

[2] Brecht et al. (2011, Journal of Geophysical Research, 116:E8, E08004): "Understanding the variability of nightside temperatures, NO UV and O2 IR nightglow emissions in the Venus upper atmosphere"

[3] Urata & Toon (2013, Icarus, 226, 336): "A new general circulation model for Mars based on the NCAR Community Atmosphere Model"

[4] Wolf et al. (2022, Planetary Science Journal, 3, 1): "ExoCAM: a 3D Climate Model for Exoplanet Atmospheres"