Wednesday, May 22, 2024

Dr. Joseph Westlake
Heliophysics Division Director
NASA Science Mission Directorate
300 Hidden Figures Way SW
Washington, D.C 20546

Dear Dr. Westlake,

On behalf of the community of scientists who study aeronomy, I am writing to provide an urgent expression of support for NASA's endeavors to implement two particular spacecraft missions: GDC (Geospace Dynamics Constellation) and DYNAMIC (DYnamical Neutral AtMosphere-Ionosphere Coupling). Specifically, as Chair of the CEDAR[1] Science Steering Committee (CSSC), I convey this message as a spokesperson for the over one thousand scientists active in the US-led CEDAR science community.

GDC and DYNAMIC were recommended as priority initiatives by the 2013 Decadal Survey for Solar and Space Physics, conducted by the National Academies of Sciences, Engineering, and Medicine. However, the FY25 Presidential Budget Request proposed the cancellation of GDC and a (perhaps lengthy) funding pause for DYNAMIC. Both of these potential scenarios are of immediate concern for CEDAR because:

- Both GDC and DYNAMIC directly address problems of core relevance to the scientific priorities of CEDAR.
- Improved understanding of space weather impacts on Earth's upper atmosphere is of key importance for US security and commercial interests, as has been dramatically highlighted by the recent G5 geomagnetic storm of May 10, 2024.
- While there have been a number of mid-size CEDAR-relevant space missions in the last two decades (such as TIMED, AIM, ICON, GOLD, etc.), there is a widespread understanding that major new platforms and programs are needed to advance understanding beyond the current achievements.

While the Presidential Budget Request was of immediate concern to the CSSC, we did not believe we held a mandate to express a position on these missions to NASA and to Congress without wider input from our community membership. Thus, beginning in mid-March, we polled our membership, asking whether or not they supported the following statement:

[1] Coupling, Energetics, and Dynamics of the Atmospheric Regions

The GDC and DYNAMIC investigations were identified in the National Academy of Sciences' 2013 "Heliophysics Decadal Survey" as high priority space missions for studying atmospheric regions spanning Earth's middle atmosphere and upward through the thermosphere, ionosphere, and exosphere. These atmospheric regions represent the core area of research for the CEDAR program, which is a community of one-to-two thousand US and international scientists, students, and community members. The CEDAR membership strongly endorses implementation of these missions, which would provide major tangible benefits to the US and international spacecraft industries, as well as to communicators, navigators, and others. In particular, the two missions working together will advance understanding of the impacts and interactions that both terrestrial and space weather have on these regions, and on practical end-users of space technologies. CEDAR urges the US Congress to ensure that adequate funding is in place to allow NASA to implement both missions in a timely and robust manner.

The poll has now been open for around two months, and the results are unequivocal. Responses from 90 verified email accounts have indicated their support for the above statement, with zero opposed. This result is essentially an open letter signed by 90 US and international scientific leaders from the field of aeronomy, expressing unanimous, 100% support for these two missions.

The CEDAR community understands that NASA must operate within the resources provided to it by the US Congress. Nevertheless, it is our hope that the results of this poll may be useful to demonstrate to the US Congress that US and international experts studying the outer layers of Earth's atmosphere are unanimous in their support for NASA's efforts to implement these missions.

Sincerely,

Dr. Mark Conde
Professor of Physics, University of Alaska Fairbanks
On behalf of CEDAR & the CEDAR Science Steering Committee