

NASA's Geospace Dynamics Constellation—Providing the first Systematic Measurements of Global Magnetospheric Energy Inputs and Ionosphere-Thermosphere Responses

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Abstract

The Geospace Dynamics Constellation (GDC) is NASA's next strategic Living With a Star mission. GDC's goals are: 1) Understand how the high-latitude ionosphere-thermosphere system responds to variable solar wind/magnetosphere forcing; and 2) Understand how internal processes in the global ionosphere-thermosphere system redistribute mass, momentum, and energy. Planned for launch by the end of the decade, GDC will use six identical observatories, each identically instrumented to fully characterize the magnetospheric drivers of the I-T system as well as the global response of the ionized and neutral gases. GDC will do this with a series of orbital configurations that will enable it to study the widest range of spatial and temporal scales to date, ranging from hundreds of kilometers and several seconds to tens of minutes, and extending through the regional to the global scale. This talk presents GDC's current status, measurement capabilities, sampling scheme, and model development efforts and show how GDC will fit into the larger Heliophysics ecosystem, by 1) obtaining critically needed scientific observations; 2) providing a source for real-time space weather and situational awareness, as

well as retrospective studies to further the science of space weather; 3) serving as a "strategic hub" for other space-based and ground-based efforts that want to leverage GDC to perform complementary science.

To get the most benefit from GDC's observations, it will be critical to identify partnerships with other research efforts in the ITM and Geospace arenas, including those utilizing space-based, ground-based, or theoretical investigations. We particularly would like to discuss with groups who are planning or considering observational campaigns during the GDC era, to find ways to leverage GDC observations to do synergistic science that could not be done otherwise.