

**ADVANCING IONOSPHERIC OBSERVATIONS WITH THE GLOBAL-SCALE
OBSERVATIONS OF THE LIMB AND DISK (GOLD) MISSION**

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The GOLD mission of opportunity will fly a far ultraviolet imaging spectrograph in geostationary (GEO) orbit as a hosted payload. The mission is scheduled for launch in late 2017 on SES-14, a commercial communications satellite that will be stationed over eastern South America at 47.5 degrees west longitude. The observations will provide fundamental information about the Earth's ionosphere and thermosphere: neutral density ratios (O/N_2) and neutral temperatures in the lower thermosphere; exospheric temperatures; peak electron densities and O_2 densities. On the nightside GOLD will produce images of the peak electron densities in the low latitude ionosphere at a cadence of 20 minutes. These images have sufficient spatial resolution to see and track bubbles in the crests of the Appleton anomaly. On the dayside GOLD spatial-spectral data will be used to derive images of the neutral density ratios over the entire sunlit disk at a 30 minute cadence. These images allow the separation of local time, universal time and longitude effects, since the same geographic locations are imaged repeatedly. Due to the ionosphere's dependence on the O/N_2 density ratio and the rapid changes that occur in it these high cadence images, the images can be used to relate neutral compositional changes to ionospheric variability observed from space and the ground and thus significantly enhance our understanding of ionosphere-thermosphere interactions. These data will provide the first simultaneous, high-cadence images of O/N_2 and temperatures - fundamental parameters for understanding the T-I system and the system's response to the forcing from below as well as from above by solar and geomagnetic forcing. This presentation will summarize the current status of the GOLD mission and the observations that it will provide.