



## **INSPIRING a new generation of University small satellite missions for space science**

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The International Satellite Program in Research and Education (INSPIRE) grew out of courses at the University of Colorado to teach aspiring students not only about the design and development of small spacecraft, but to be immersed in the outstanding science that can be accomplished with such missions. INSPIRE today has four small satellite missions in development funded by four countries with mission objectives ranging from studying Ionospheric dynamics, Mesosphere and Lower thermosphere wind and temperature observations and Solar observations in mid and far ultraviolet wavelengths. It is also developing a versatile University small satellite platform capable of carrying a variety of payloads ranging from plasma instruments to Ultra-Violet and Infra-Red imagers. A network of four S-band stations and eight UHF ground stations enables high data downlink from these platforms. In this presentation we will be describing in detail INSPIRESat-1 & 2 science objectives in making simultaneous measurements of ion densities, velocities and temperature from two different altitudes and a range of local times to characterize plasma bubbles and traveling ionospheric disturbances. INSPIRESat-3 carrying a UV instrument is designed to make solar observations in the mid and far UV extending the SORCE observations beyond 2019 as well as occultation measurements of the thermosphere to derive gravity wave effects in thermospheric temperatures in the high latitudes in both hemispheres from a sun synchronous orbit. INSPIRESat-4 to be launched into a near equatorial orbit, is carrying a hall effect thruster to progressively lower its altitude and make in-situ plasma measurements in the equatorial ionosphere. IS-4 will also carry a spatial Heterodyne Interferometer to make temperature measurements in the MLT region. The INSPIRE small satellite bus is a ring deployed satellite that mounts on the launch vehicle payload fairing. the spacecraft bus is configurable to carry a variety of instruments. However the different sub-systems and card stacks conform to the cubesat standard and hence can be used in standard cubesat configuration as well.