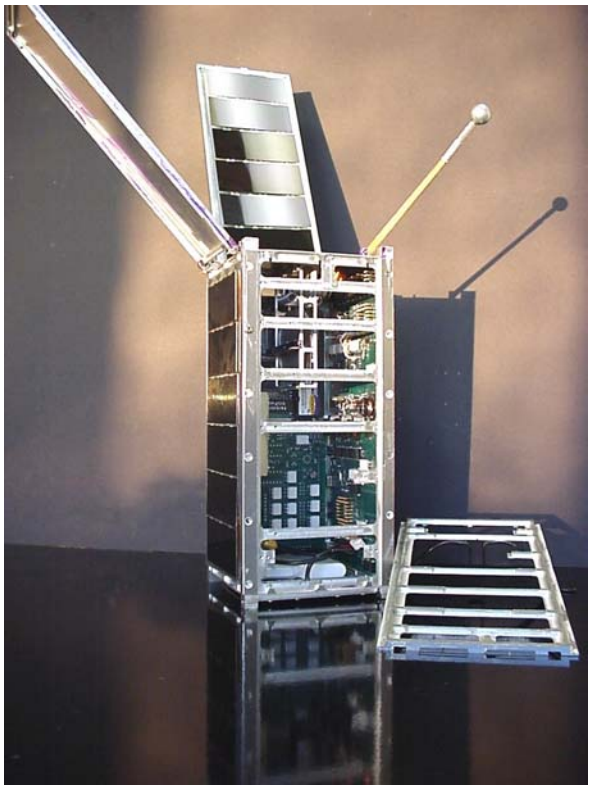
Engineering

TU SAT 1: A NOVEL COMMUNICATIONS AND SCIENTIFIC SATELLITE

David, L, Voss
Taylor University
236 W Read Ave
Upland, IN 46989
david_voss@tayloru.edu
Dr. Hank D. Voss*

TU Sat 1 is a multipurpose nanosatellite developed by undergraduate students for launch in 2003. It is scheduled for launch in a polar orbit at an altitude of 650 km on the first CubeSat mission. TU Sat 1 provides a low-cost store and forward email communication system (2.4 GHz) with emphasis for use in 3rd world nations. Integrated designs and efficient power control allow TU Sat 1 to be a highly functional satellite despite its small size, 10cm x 10 cm x 20 cm, and mass, 1.5 kg. In addition, TU Sat 1 measures space plasma density, tether field electrodynamics, and 3-axis magnetic field variations. The technology of TU Sat 1 makes it a good test bed for future solo and constellation missions because it includes a 30 m tether, a 3-axis magnet torquer, deployable solar cells, four micro controllers, one 386 computer, two communication systems, and a modular mechanical frame. The focus of the talk will be on the novel engineering designs and system integration needed to improve performance while maintaining the size and weight constraints. It will also discuss how these technologies could be used in a future low-cost mission to the sun.