DEPARTMENT OF *physics* | SCHOOL OF NATURAL SCIENCES & MATHEMATICS UTD

UNIVERSITY OF TEXAS AT DALLAS - DEPARTMENT OF PHYSICS and SIGMA XI RESEARCH SOCIETY

Colloquium

Wednesday, November 12, 2008; 3:30-4:30 PM
TI Auditorium ECSS 2.102
Refreshments will be served at 3:00 PM

Space Science with Small Satellites

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Interactions between the co-located "oceans" of ionized and neutral gas that surround the Earth create a host of interesting phenomena that have real-world consequences for satellite and terrestrial-based communication and navigation systems. These gaseous media and the physics governing their behavior have been studied over the last 50 years using a combination of rocket probes, satellites, radars, and computational modeling. Such studies are multi-faceted, and require cooperative efforts between scientists and engineers with expertise in plasma physics, gas dynamics, fluid flow, instrumentation, signal processing, micro-machining, and many other disciplines.

Due to the high cost of spaceflight, previous missions have been limited in scope, with the result that our knowledge of the near-Earth space environment is based largely on measurements that cannot adequately separate spatial and temporal causes and effects. Recent developments in the microsatellite arena are beginning to change this by making it feasible to launch suites of satellites that make simultaneous measurements at many locations around the Earth. These developments are poised to revolutionize space science.

In this talk the promise and challenges associated with these new microsatellite ventures are described and set in the context of the current "big problems" in space science. It will be demonstrated that universities have a significant part to play in these new state-of-the-art endeavors, with a clear role for students. Examples of ongoing research at the University of Texas at Dallas will be used to highlight a number of these areas, and will reveal some research avenues leading to rewarding career opportunities in aerospace industries.