University of Colorado at Boulder

AEROSPACE ENGINEERING SCIENCES

Seminar

Marcin Pilinski

Research Engineer and Scientist

Atmospheric and Space Technology Research Associates (ASTRA)

The Emergence of Small Satellite Platforms as a Means of Developing New Technologies

Small Satellites, and CubeSats (<10kg) in particular, have emerged as a quick and affordable way to access the space environment. The resulting evolution in the secondary-payload capabilities is now driving a revolution in the way spacecraft hardware can be developed. This has come about due to drastically decreased times between successive launches which has enabled increased iterations in the design-build-test cycles for miniaturized space hardware. Another factor is that lower costs and increased access to space is beginning to foster a different approach to risk management wherein mission risk is reduced by the quantity of satellites flown and their simplicity rather than expensive and redundant hardware. Examples of hardware development benefiting from these new approaches include new attitude control systems, communications systems, as well as spacecraft sensors to name a few. In this talk I will describe several small satellite systems which take the new approach to space-hardware development. The first is an attitude control system adapted for a spinning CubeSat. The second is the development of miniaturized thrusters for small satellites. In both cases we will examine how the dynamic technology development driven by small satellites has benefited the designs of these systems.

Wednesday, April 29, 2015
12:00 – 1:00 pm
DLC Collaboratory

Biography:

Dr. Pilinski's main research tacks are small-satellite system-design as well as the design and utilization of novel small satellite sensors for space physics and geophysics research. He received his Ph.D. in Aerospace Engineering Sciences in 2011 from the University of Colorado in Boulder. Following this, Dr. Pilinski has served as a research engineer and scientist at the Atmospheric and Space Technology Research Associates (ASTRA). Dr. Pilinski has worked on the design, build, and test of two small satellites which have both launched and operated in orbit (FASTRAC and DANDE), participated in the operation of a CubeSat as well as in the data processing and analysis from its instruments (DICE), and has been the system engineer on numerous CubeSat systems currently in development including DIME (AFRL, electric field measurements) for which he also developed onboard control algorithms and SORTIE (NASA, ion drifts and plasma densities).