



AEROSPACE ENGINEERING SCIENCES

Invited Guest Seminar



Mark Vincent

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& Senior Research Associate at CCAR

The Risks and Rewards of Flying in the A-Train Constellation

The A-Train is an international constellation of six satellites flying together in a sun-synchronous, frozen orbit with an equatorial altitude of 705 km. It is also called the Afternoon Constellation since the satellites cross the equator near 1:30 PM local time. It is a successful demonstration of getting spatially and temporally correlated observations from a constellation of satellites, while reaping the benefits of having separate platforms and instruments. It is also a model for international cooperation in both science and navigation.

This talk will first define the concept of constellation flying and then give a brief history of the A-Train member satellites and their instruments. The process of flying in independent control boxes will be explained along with the maneuvers required to maintain the constellation configuration. The methods of how to enter and exit the constellation will be described. Highlighted will be the experiences of the latest member: the Orbiting Carbon Observatory (OCO-2). Finally, the ever-increasing threat from orbital debris and how it has been mitigated will be presented.

Friday, October 10, 2014

2:00 – 3:00 PM

KOBL 210

Light refreshments

Mark Vincent earned his bachelor's (engineering-physics) at the University of Toronto, master's degree (environmental science and management) at the University of California at Santa Barbara, and his PhD (aerospace engineering-orbital mechanics) at the University of Texas at Austin. He has been responsible for mission design for many Earth and Mars missions, including orbit design, launch vehicle targeting, operations and navigation, and system engineering. Currently he is working on the Orbital Carbon Observatory, which is sampling global atmosphere CO₂. His current customers are the Jet Propulsion Laboratory and the Goddard Space Flight Center.