



## AEROSPACE ENGINEERING SCIENCES

# Seminar

## Jay McMahon

Assistant Research Professor  
Department of Aerospace Engineering Sciences

### Enabling a Sustainable Space Economy

It is an amazing time to be involved in space research – the discovery of numerous exoplanets in our galaxy with Kepler, exciting exploration missions to sample asteroids (OSIRIS-REx, Hayabusa 2), observe a comet (Rosetta), learn about the Kuiper Belt (New Horizons), and search for life elsewhere in our solar system (Europa), to name a few – show that humanity still has a lot to learn about our place in the universe. At the same time, New Space is driving a renaissance in the participation and accomplishments of commercial companies in space. It appears that we are on the verge of a new era of involvement in space.

In this talk, I will discuss my research in planetary science and aerospace engineering, and how I plan to leverage these activities to enable sustainable economic applications in space. I see my contributions to this goal falling in three important areas: autonomy, in-situ resource utilization, and space situational awareness. I will present details on a several projects which support these pursuits. First, my work for the OSIRIS-REx asteroid sample return mission, where I am the deputy-lead of the Radio Science Working Group. In this role I am primarily responsible for estimating the gravity field of the target asteroid, Bennu, as well as understanding the geophysical implications of the estimated gravity. Second, I will discuss a current project investigating a new architecture for safely, robustly, and repeatedly acquiring material from the surface of a small body by leveraging the natural dynamics of the body. Last, but certainly not least, I will discuss my teaching experience and how I see myself fitting in at The University of Colorado Boulder.

**Wednesday, April 20, 2016**

**12:00 Noon**

**DLC Collaboratory**

**Bio:** Jay McMahon is currently an Assistant Research Professor in the Colorado Center for Astrodynamics Research (CCAR) at the University of Colorado in Boulder. He received his PhD in Aerospace Engineering Sciences in 2011, worked as a Research Associate following that, until early 2013 when he became an Assistant Research Professor. Prior to Boulder he lived in Los Angeles where he worked in the Guidance Analysis department at The Aerospace Corporation from 2004-2008. His previous degrees include a MS in Astronautical Engineering from the University of Southern California in 2006 and a BS in Aerospace Engineering from the University of Michigan in 2004. His research interests are focused on asteroid science and missions, space situational awareness, and space vehicle guidance, navigation, and control.