Announcing the Final Examination of Curtis Groves for the degree of Doctor of Philosophy

Time & Location: March 21, 2014 at 3:30 PM in Engineering 1 307
Title: Computational Fluid Dynamics Uncertainty Analysis for Payload Fairing Spacecraft Environmental Control Systems

Spacecraft thermal protection systems are at risk of being damaged due to airflow produced from Environmental Control Systems. There are inherent uncertainties and errors associated with using Computational Fluid Dynamics to predict the airflow field around a spacecraft from the Environmental Control System. This research describes an approach to quantify the uncertainty in using Computational Fluid Dynamics to predict airflow speeds around an encapsulated spacecraft without the use of test data. Quantifying the uncertainty in analytical predictions is imperative to the success of any simulation-based product. The method could provide an alternative to traditional “validation by test only” mentality. This method could be extended to other disciplines and has potential to provide uncertainty for any numerical simulation, thus lowering the cost of performing these verifications while increasing the confidence in those predictions.

Major: Mechanical Engineering

Educational Career:
Bachelor's of Aerospace Engineering, BS, 2008, West Virginia University
Master's of Aerospace Engineering, MS, 2012, University of Central Florida

Committee in Charge:
Alain Kassab, Chair, Mechanical and Aerospace Engineering
Tuhin Das, University of Central Florida, Mechanical and Aerospace Engineering
Jeffery Kauffman, University of Central Florida, Mechanical and Aerospace Engineering
Brian Moore, University of Central Florida, Math Department

Approved for distribution by Alain Kassab, Committee Chair, on February 18, 2014.

The public is welcome to attend.