



## AIAA Section Meeting

Thursday, November 19, 2015

**Dr. Donovan Mathias**

**Engineering Risk Assessment Team Lead, NASA Ames Research Center**

**“Airbursts, Explosions, and Impacts: Use of Simulations for Risk Informed Decision Making within NASA”**

**Location: Bethpage Public Library  
47 Powell Avenue  
Bethpage, NY 11714**

**RESERVATIONS REQUESTED  
RSVP BY Nov. 18, 2015  
to: Dave Paris at  
davidsparis@twc.com  
or (718) 819-8293**

**Time: 6:00 PM Social Time  
6:30 PM Pizza  
7:00 PM Presentation**

**Cost for Pizza: \$5, Members and Guests  
Free, for Students**

Risk-Informed Decision Making (RIDM) is employed throughout the National Aeronautics and Space Administration (NASA) to maximize the robustness of choices in the presence of uncertain information. Applications include spaceflight system design, launch commit criteria, procurement, and operational threat mitigation decisions. A critical element of the process is a faithful assessment of the uncertainties within the system. Often, physical processes are so complicated that their impact is not well-characterized, and the resulting uncertainty may have a significant impact on the results, which can lead to misinformed choices. Fortunately, however, modern modeling and simulation capabilities have opened new assessment capabilities that can shed light on many physical scenarios. In this talk, Dr. Mathias will show how these simulations are being used to quantify risk in dynamic systems, assess the impact of key uncertainties, and inform real-world decisions. Specific examples will include launch vehicle explosion modeling to improve abort system design for crewed missions; failure propagation in the engine bay of a rocket; hypervelocity impacts of micrometeoroids on spacecraft; and asteroid impact threat assessment.

Donovan Mathias is an Aerospace Engineer in the Advanced Supercomputing Division at NASA Ames. He has been at Ames since 1992, during which time he has worked extensively in the field of computational modeling. He has spent the last fifteen years developing risk assessment tools and creating risk models that incorporate physics-based analyses. He has served as Principal Investigator for the Simulation Assisted Risk Assessment project, has performed risk assessments for multiple NASA architecture studies, and was the Crew Safety and Reliability Manager for the Ares I Launch Vehicle. His work to advance the state-of-the-art in risk assessment methods has resulted in numerous NASA Group Achievement Awards, a Space Flight Awareness Award, a Silver Snoopy, and a NASA Exceptional Leadership Medal. Dr. Mathias earned his Ph.D. in Aeronautics and Astronautics from Stanford University.

**Directions:** The library is west of Route 135 in Bethpage. Take Route 135 to Exit 8, then West on Powell Ave. for about 0.25 miles. The library is on the south side of the street. Park across Powell Ave., opposite the library.