

# IMPLAST 2010

*A Symposium on Plasticity and Impact (including Blast) Mechanics*

## Plenary



### *Challenges to Fielding Robust, Durable, Re-usable Platforms Capable of Sustained Hypersonic Flight and Responsive Space Access*

#### **DR. RAVINDER CHONA**

USAF Senior Scientist & Director, Structural Sciences Center  
Air Force Research Laboratory, Air Vehicles Directorate, Wright-Patterson Air Force Base

**Tuesday, October 12, 2010, 1:20 PM**

The capability to repeatedly “go-high, go-far, go-fast” and to do this on-demand, as often as needed, and with the same platform is one that the United States Air Force has sought for over half a century. This lecture will enumerate some of the key technical challenges from a structures and mechanics perspective and will detail ongoing efforts within the US Air Force Research Laboratory, and amongst its academic partners, that are vectored towards making this long-desired capability a reality. The ultimate objective is shown to be a full-platform simulation of the structural response and forecasting of structural life for platforms that encounter intense, highly-coupled, aero-thermo-acoustic operating environments for extended durations, as these platforms undoubtedly do.

Dr. Ravi Chona, a member of the Senior Scientific and Professional Service of the United States of America, is a United States Air Force Senior Scientist and the Director of the Structural Sciences Center at the Air Force Research Laboratory, a leadership position he was recruited to in 2003. Previously, he was a member of the Mechanical Engineering Faculty (1987-2003) and the Director of the Institute for Innovation and Design in Engineering (1999-2003) at Texas A&M University. Prior to that (1977-1987) he was an undergraduate and a graduate student, a researcher, and an instructor at the University of Maryland at College Park, where he earned his BS, MS, and PhD degrees in Mechanical Engineering and enjoyed the unique privilege of having as his graduate advisor and mentor, the late Professor George R. Irwin – the founding father of engineering fracture mechanics. At AFRL, Ravi is charged with ensuring that the US Air Force possesses the cutting-edge aero-structural solutions essential to fielding revolutionary air and space platforms that can assure the air dominance required by the national security and strategic needs of the United States. Ravi’s personal research and academic teaching emphases have been largely in experimental solid mechanics, fracture mechanics, engineering mechanics, and engineering design methods. He has taught many graduate and undergraduate courses; authored numerous professional publications and edited three monographs; delivered many contributed, invited, keynote, and plenary talks at national and international forums; taught and developed short courses targeting a practitioner audience; and supervised 20+ theses & dissertations and 25+ graduate and senior-level, industrially-sponsored, design project teams. His professional contributions have been recognized via: the NSF-PYI Award (1991); Departmental (1997) and College (1998) Teaching Awards at Texas A&M; election as Fellow of ASME (2001), Fellow of ASTM (2000), and Fellow of SEM (2002); the Irwin Medal from ASTM International (2003); the Presidency of the Society for Experimental Mechanics (1997-1998); the Chairmanship of ASTM International Committee E08 on Fatigue & Fracture (2006-present); Membership on the US National Committee on Theoretical & Applied Mechanics (2001-2009); Editorial Board Membership for several journals, including *Experimental Mechanics*; and the position of US National Delegate to the International Committee on Aeronautical Fatigue (2006-present).