KLEIN LECTURE in Aerospace Engineering

Graduate Aerospace Laboratories of the California Institute of Technology

The Right Kind of Crazy: Risk, Reason, and the Physics of Landing

On August 5th 2012, Caltech's Jet Propulsion Laboratory successfully landed the Curiosity rover on Mars. Curiosity is the largest rover ever sent to another planet. The landing system seemed wild to many observers, but it was in fact the result of carefully applied engineering reason and analysis. Entry, descent, and landing technology sometimes looks a bit foolish to the uninitiated.

Dr. Steltzner will discuss four topics related to entry, descent, and landing: first, the history and development of the Curiosity EDL system and, in particular, the history of the Sky Crane landing system; second, differing touchdown systems, their architectures and techniques, including airbags, legged landers, pallets, sky cranes, and how they create understandable, predictable and testable systems; third, sensor technology and bandwidth and how the requirements for such bandwidth might vary across various solar system surface destinations; and finally, a brief treatment of entry technology, ballistic coefficients, inflatable heat shields and high altitude atmospheric variation will be offered.

Adam D. Steltzner

Jet Propulsion Laboratory

Dr. Adam D. Steltzner is the Manager of the Planetary Entry, Descent and Landing and the Small Body Access Office at the Jet Propulsion Laboratory. Most recently, he was the lead of the Curiosity Entry, Descent and Landing team. Adam received his B.S. in Mechanical Engineering from the University of California, Davis in 1990; he received his M.S. in Applied Mechanics from Caltech in 1991 and his Ph.D. in Engineering Physics from the University of Wisconsin, Madison in 1999. Adam joined JPL in 1991 and has worked on various projects that include Galileo, Cassini, Mars Pathfinder, Champollion, Comet Nucleus Sample Return, and Mars Exploration Rovers. His research interests include structural dynamics, input force determination, aerodynamic decelerators, mechanical design and systems engineering. His management interest focuses on how attitude and leadership can produce high performance teams.

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1 p.m., Beckman Institute Auditorium
California Institute of Technology

For information please Contact: Cheryl Gause at cherylg@caltech.edu or (626) 395-2118

This series of lectures is given in memory of Professor Arthur Louis "Maj" Klein (1898-1983), a faculty member of GALCIT from 1929 until his death. In addition to his significant contributions as a teacher of aeronautical engineering, Klein was responsible for the engineering and building of the GALCIT 10-foot wind tunnel and made significant contributions to aircraft design.

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