

Seminar Announcement

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11:00 A.M.

Engineering
Bldg
Room 203E



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Optimal design of actively cooled panels for hypersonic vehicles: A combined materials/geometry selection protocol

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The design of materials for the thermo-structural protection of fully reusable hypersonic vehicles (Mach > 6) presents enormous challenges. In different locations on the vehicle, the severe combination of intense and maintained heat fluxes and pressure loads defies conventional solutions. In this talk, I will discuss a novel materials/geometry selection methodology applicable to lightweight actively-cooled panels, particularly suitable for the most demanding aerospace applications. The key ingredient is the development of a protocol that can be used to establish the capabilities and deficiencies of existing panel designs and direct the development of advanced materials. An illustration will be provided for a fuel-cooled combustor liner of a Mach 7 vehicle, optimized for minimum weight under realistic constraints on stress, temperatures and pressure drop.

In closing, the talk will briefly introduce some additional areas of research that Dr. Valdevit's group at UCI is currently pursuing.

Bio-sketch

Lorenzo Valdevit holds an MS degree (Laurea) from the University of Trieste, Italy and a PhD degree from Princeton University. He worked as an intern at the IBM T.J. Watson Research Center and as a post-doctoral scholar at the University of California, Santa Barbara. He is presently an Assistant Professor in the Mechanical and Aerospace Engineering Department and the Chemical Engineering and Materials Science Department at the University of California, Irvine. His current research interests include thermo-mechanical optimization of sandwich structures for aerospace applications, composite materials, small-scale morphing structures and micromechanics, and electronics packaging.

Host: Dr. Satchi Venkataraman