



Ústav termomechaniky AV ČR, v.v.i.

v rámci přednáškového cyklu **Seminář Ústavu termomechaniky**

si Vás dovoluje pozvat na přednášku

Modelling extreme deformation and dynamic behaviour of materials using mesh-less methods

kterou přednese

Dr. Raj Das

Sir Lawrence Wackett Aerospace Research Centre, School of Engineering,
RMIT University, Australia

The seminar will present overview of computational mechanics research at the Centre for Multifunctional and Composite Materials of RMIT University, Australia. Our research covers both fundamental and applied aspects of material behaviour and failure processes. This presentation will encompass computational modelling of material deformation, damage and fracture using multi-scale techniques in conjunction with mesh-less methods, novel composite materials development and damage tolerance structural optimisation.

Multi-scale modelling of damage and fracture progression linking nano to macro scales and associated development of coupled computational modelling tools will be highlighted. The strengths of mesh-less methods will be illustrated with reference to both low to high-speed impact induced fractures and small to large scale problems. These include several dynamic fracture and fragmentation processes, such as hypervelocity impact fracture, nano-scale machining, large scale geo-mechanical failures (magma intrusion, caving, slope stability, etc).

One of our core areas to be presented is novel impact and blast resistant, light weight composite material developments for aerospace components subjected to high-speed loading and extreme deformations, as occurs in the cases of debris impact on spacecrafts, bird strike on aircraft engines, blast induced failures, etc. Lastly novel shape and topology optimisation methodologies for damage tolerance optimisation, i.e. maximising the residual strength and fatigue life, of aero-structures will be highlighted. Case studies from projects with Royal Australian Air Force and Defence Science and Technology Organisation will be presented to demonstrate the practical implementation and utilities of the developed design and analysis methodologies.

**Přednáška se bude konat
v pondělí 26. června 2017 od 10:00 hodin
v budově Ústavu termomechaniky (posluchárna B)
Dolejškova 5, 182 00 Praha 8**



Biography: Dr. Raj Das is a faculty member in the Aerospace and Aviation department of RMIT University, Australia and an honorary academic in the University of Auckland, New Zealand. He is a principal investigator of the ‘Sir Lawrence Wackett Aerospace Research Centre’ of RMIT University. He is an adjunct academic of the University of Quebec, Canada. He is the Deputy Chair of the ‘National Committee on Applied Mechanics’ of Engineers Australia. Dr. Das has published more than 200 papers in international journals and conferences. Dr. Das has a PhD from Monash University, Australia in Structural Optimisation and Failure Analysis. Dr. Das has previously worked in the University of Auckland (New Zealand), the Commonwealth Scientific and Industrial Research Organisation (Australia), and the University of Manchester (UK).



Dr. Das has research capabilities in advanced materials, such as metamaterials, auxetic materials, architected materials, composite materials, impact behaviour and failure analysis of metals, ceramic and composite materials, topology and shape optimisation for materials and structural designs, computational modelling, fracture mechanics, dynamic fracture, damage tolerance based optimisation, numerical modelling and multi-scale analysis using finite element and mesh-less methods. He has served on the scientific committees of more than 80 international conferences. Dr Das is on the editorial board and review panel of several journals and funding agencies.

Dr Das has been granted several national and international awards and fellowships, including the ‘Jim & Hazel D. Lord Emerging Faculty Fellowship’, ‘Research Excellence Award’, and ‘AUEA Emerging Researcher Award’ by the University of Auckland. He has received the ‘CONICYT award’ from the Government of Chile, ‘Certificate of Merit Award’ from the International Association of Engineers, Hong Kong, ‘UQAC Visiting Fellowship’ from the University of Quebec, Canada, and ‘Visiting Researcher Fellowship’ from the University of Cape Town, South Africa.

**Přednáška se bude konat
v pondělí 26. června 2017 od 10:00 hodin
v budově Ústavu termomechaniky (posluchárna B)
Dolejškova 5, 182 00 Praha 8**