



# SEMINAR

APPLIED MATHEMATICS AND MECHANICS

FS948

1 March 2019

A DCAMM seminar No. 736 will be presented by

**Professor Ramesh Talreja**  
**Department of Aerospace Engineering**  
**Department of Materials Science and Engineering**  
**Texas A&M University, College Station, Texas, USA**

The title of the lecture is

## **Quantification of Manufacturing Defect Severity in Composites for Failure Assessment**

### **Abstract:**

Composite materials are manufactured by a variety of processes that produce microstructural compositions depending on the process histories. In spite of efforts to achieve perfect microstructures, real manufactured composites contain defects in the forms of nonuniform fiber distributions, fiber misalignment, matrix voids, etc. Such defects affect the composite's performance, such as structural integrity and durability, when exposed to service environments. In many cases, the early failure events are significantly affected by the defects, and inadequate account of these effects leads to inaccurate assessment of damage progression and ultimate failure. Furthermore, evaluating the goodness of the manufacturing process requires that the defects are quantified in terms of their severity with respect to the performance metric. A concept for defect severity quantification will be proposed that generalizes the geometric size characterization and allows incorporation of the parameters governing the particular failure mode under consideration. Two failure modes in unidirectional composites will be taken to illustrate implementation of the defect severity measures: a) transverse cracking and b) longitudinal fiber microbuckling.

<b>DATE:</b>	<b>Friday, 15 March 2019</b>
<b>TIME:</b>	<b>10:00 – 10:45 + questions</b>
<b>PLACE:</b>	<b>Meeting room 2+3, Building 228 DTU Risø Campus Frederiksborgvej 399, 4000 Roskilde</b>

Danish pastry, coffee and tea will be served 15 minutes before the seminar starts.

All interested persons are invited.

Niels Leergaard Pedersen

**DANISH CENTER FOR APPLIED MATHEMATICS AND MECHANICS**

**• TECHNICAL UNIVERSITY OF DENMARK • AALBORG UNIVERSITY**  
**• AARHUS UNIVERSITY • UNIVERSITY OF SOUTHERN DENMARK**