DCAMM SEMINAR

APPLIED MATHEMATICS AND MECHANICS

FS930 1 March 2018

A DCAMM seminar No. 720 will be presented by

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The title of the lecture is

Multi-Scale Optimization Strategies for Electronics Thermal Management & Energy Harvesting

Abstract:

The compact and power-dense nature of advanced electronics is expected to push the limits of traditional thermal management techniques. At the same time, low-grade waste heat represents a tangible source of inefficiency for future electrified systems. Exploiting effective design optimization strategies in the research and development of new cooling and material technologies enables opportunities for increased system performance. Accordingly, gradient-based structural optimization methodologies and their implementation at multiple scales is the focus of this talk. Specifically, electronics thermal management and waste heat recovery are explored as end applications. At the component level, several case studies are presented to illustrate the technical approach for air, single-phase liquid, and two-phase cooling of automotive power electronics. Heat flow control for enhanced operation of electronics is further discussed, and this topic is connected to the material scale, where thermal composite printed circuit board design for informed heat flow and energy harvesting has benefits. Through these various examples, multi-scale optimization is revealed to be an essential element in the drive towards novel high performance thermal energy management technologies.

DATE: **Wednesday, 14 March 2018**

TIME: **10:00 – 10:45 + questions**

PLACE: **Room 024, Building 414,**
DTU, Technical University of Denmark

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

All interested persons are invited.

Niels Leergaard Pedersen