<u>FS1009</u>   1 May 2025

A DCAMM seminar No. 785 will be presented by

Professor Peter Wriggers
Institute for Continuum Mechanics
Leibnitz University Hannover, Germany

The title of the lecture is

Virtual elements for solids – an engineering perspective

Abstract:

The Virtual Element Method (VEM) is an emerging and powerful computational technology for the approximate solution of partial differential equations (PDEs), grounded in the same variational principles as the finite element method (FEM). What sets VEM apart is its remarkable flexibility in handling general polygonal and polyhedral meshes—including complex features such as hanging nodes, 'highly distorted, or non-convex elements—while still maintaining the mathematical rigor and conformity essential to the method.

- Homogenization of materials with polycrystalline microstructure,
- C1-continuous formulation of plate and shell elements
- Contact problems with matching meshes,
- Fracturing of brittle solids,
- Discrete flexible elements and
- Stabilization free formulations

The lecture provides a comprehensive overview of the Virtual Element Method, critically examining its advantages and limitations in comparison to traditional numerical techniques. It delves into specialized strategies for the numerical discretization of solid mechanics problems, highlighting how VEM can be effectively applied in fields such as structural analysis, geomechanics, and material modeling.

DATE: **Wednesday, 14 May 2025**

TIME: **10:00 - 10:45**

PLACE: **Building 414, Room 061B**
           DTU, Technical University of Denmark

REGISTRATION for virtual participation at the following link:
https://dtudk.zoom.us/j/65783877676?pwd=qZ3POsncf4jJaEKkZL91OFcDdazZAO.1

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

All interested persons are invited.

Jan Becker Høgsberg

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