DANISH CENTER FOR APPLIED MATHEMATICS AND MECHANICS

# The 2019 DCAMM Annual Seminar Speaker

in connection with DCAMM's 50 years anniversary

## Yuri Bazilevs

**E. Paul Sorensen Professor of Engineering**
**Brown University, USA**

gives the following lecture at the

## Technical University of Denmark

Meeting Centre, Room S09,
Building 101, Kgs. Lyngby

## Isogeometric Analysis of Solids, Fluids, and FSI for Extreme-Event Simulation

## Thursday, November 7, at 13:00

There will be an open discussion after the lecture.

The Danish Centre for Applied Mathematics and Mechanics, DCAMM, is a framework for internationally oriented scientific collaboration between staff members at a number of departments at the Technical University of Denmark, Aalborg University, Aarhus University and University of Southern Denmark. The "DCAMM Annual Seminar Speaker" is an initiative created to disseminate mechanics to a broader audience.
*For further information on DCAMM, see www.dcamm.dk*

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# Isogeometric Analysis of Solids, Fluids, And FSI for Extreme-Event Simulation

**Abstract**

This presentation is focused on Isogeometric Analysis (IGA) and modeling of extreme events. In particular, a novel framework for air-blast-structure interaction (ABSI) based on an immersed approach coupling IGA and Meshfree particle methods is presented and verified on a set of examples. Several numerical challenges exist for carrying out the aforementioned simulations, and these are addressed in the presentation. The challenges include, among others, treatment of localization of deformation, capturing of shocks in both the fluid and solid parts of the problem, and addressing near incompressibility, which is important in the presence of plastic deformations. The presentation is infused with examples that highlight the power and general applicability of the ABSI framework.