Conference Agenda

Modern Finite Element Technologies 2025

Date: Tuesday, 19/Aug/2025

6:00pm - 8:00pm	**Welcome Reception** Location: **Sky Lounge**

Date: Wednesday, 20/Aug/2025

8:30am - 8:50am **Opening**
Location: **Ford Auditorium, SuperC**

8:50am - 9:50am **Session 1**
Location: **Ford Auditorium, SuperC**

Interpolations for the magnetic field - A comparison of H(curl) and Lagrange elements
Maximilian Vorwerk[1], **Mohammad Sarhil**[2], **Jörg Schröder**[1]
1: University of Duisburg-Essen, Germany; 2: TU Dormund, Germany

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Benefits of Using Master-slave Elimination for Nonlinear Multi-point Constraints in Finite Element Analyses
Jonas Boungard, **Jens Wackerfuß**
University of Kassel, Germany

Non-Conforming Dirichlet Boundary Conditions Using Master-Slave Elimination
Julian Meyer, **Michael Kaliske**
Institute for Structural Analysis, Technische Universität Dresden, Germany

9:50am - 10:20am **1st Coffee Break**
Location: **Ford Auditorium, SuperC**

10:20am - 11:10am **Recent Developments on the Isogeometric Analysis Paradigm by Angelos Mantzaflaris**
Location: **Ford Auditorium, SuperC**

11:10am - 11:50am **Session 2**
Location: **Ford Auditorium, SuperC**

Parametrization of Star-shaped Spline Elements
Elio Skënderaj, **Bert Jüttler**
Johannes Kepler University Linz, Austria

An Efficient Static Condensation Procedure for Mixed Isogeometric Formulations
Lisa Stammen, **Wolfgang Dornisch**
RPTU Kaiserslautern-Landau

11:50am - 1:00pm **Lunch Break**
Location: **Mensa Academica**

1:00pm - 1:50pm **TDNNS mixed finite elements for solids and shells by Joachim Schöberl**
Location: **Ford Auditorium, SuperC**

1:50pm - 3:30pm **Session 3**
Location: **Ford Auditorium, SuperC**

On Isotropic Tensors and Continuity
Adam Sky
University of Luxembourg, Luxembourg

A Reynolds-Robust Discretisation of the Navier–Stokes Equations via Enstrophy Stabilisation
Boris D. Andrews[1], **Matin Shams**[1], **Patrick E. Farrell**[1,2]
1: University of Oxford, United Kingdom; 2: Charles University, Czech Republic

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Finite Element Form-valued Forms

Kaibo Hu[1], **Ting Lin**[2], **Qian Zhang**[3]
1: University of Edinburgh, United Kingdom; 2: Peking University, China; 3: Michigan Technological University, USA

Discretizing Linearized Einstein-Bianchi System by Symmetric and Traceless Tensors

Yuyang Guo, **Jun Hu**, **Ting Lin**
Peking University, China, People's Republic of

A Construction of Canonical Nonconforming Finite Element Spaces for Elliptic Equations of Any Order in Any Dimension

Jia Li, **Shuonan Wu**
School of Mathematical Sciences, Peking University, Beijing, P.R.China

3:30pm - 4:00pm **2nd Coffee Break**
Location: **Ford Auditorium, SuperC**

4:00pm - 5:20pm **Session 4**
Location: **Ford Auditorium, SuperC**

A Taylor-Series-based Reduced Integration Stabilization Technique for Large Deformations

Hagen Holthusen[1], **Njomza Pacolli**[2], **Stefanie Reese**[3]
1: FAU Erlangen-Nuremberg, Germany; 2: RWTH Aachen University, Germany; 3: University of Siegen, Germany

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The Virtual Element Method for Static and Dynamic Crack Analysis

Philipp Wappler, **Kevin Schmitz**, **Andreas Ricoeur**
University of Kassel, Germany

An Adaptive Mesh Reorientation Algorithm to Improve Crack Path Prediction Reliability in 2D and 3D Fracture Analyses using Cohesive Zone Models

Koussay Daadouch, **Vladislav Gudžulić**, **Günther Meschke**
Ruhr University Bochum, Germany

Dual-Mesh Phase-Field Method For Brittle Fracture Employing Polygonal Finite Elements

Tomislav Jarak[1,2], **Krešimir Jukić**[2], **Antolin Lorenzana Iban**[1]
1: University of Valladolid, Spain; 2: University of Zagreb, Croatia

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On a Triangular Self-Stabilized Virtual Element for Thin Shells

Tiago Wu, **Paulo Pimenta**
University of São Paulo, Brazil

Date: Thursday, 21/Aug/2025

8:30am - 9:50am — **Session 5**
Location: **Ford Auditorium, SuperC**

Computationally Simple And Efficient Locking Alleviation In Isogeometric Thin Shells
Lennart Stöttelder, Sauer Roger A. Sauer
Ruhr-Universität Bochum, Germany

A Cubic Triangular Multilayer Kirchhoff-Love Shell Element with Shear Stress Analysis
Gustavo Canário Gomes[1], Paulo Pimenta[1], Adnan Ibrahimbegovic[2]
1: University of São Paulo, Brazil; 2: Université de Technologie de Compiègne/Alliance Sorbonne Université

Investigation of Nonlinear Locking Phenomena in Novel Stabilized Mixed Element Formulations
Henrik Jakob, Tarun Kumar Mitruka Vinod Kumar Mitruka, Simon Bieber, Manfred Bischoff
University of Stuttgart, Institute for Structural Mechanics, Pfaffenwaldring 7, 70550 Stuttgart, Germany

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An Efficient Rodrigues Rotation Parameters Based Geometrically-Exact Nonlinear Shell Formulation
Cinthia A. G. Sousa[1,2], Maximilian Vorwerk[1], Paulo M. Pimenta[2], Jörg Schröder[1]
1: University of Duisburg Essen, Germany; 2: Polytechnic School at University of São Paulo

9:50am - 10:20am — **1st Coffee Break**
Location: **Ford Auditorium, SuperC**

10:20am - 11:10am — **Intrinsically Selective Mass Scaling with Hierarchic Shell Formulations by Manfred Bischoff**
Location: **Ford Auditorium, SuperC**

11:10am - 11:50am — **Session 6**
Location: **Ford Auditorium, SuperC**

Analysis-Suitability Of Nonlinear Reissner–Mindlin Shell Formulation With Drilling Rotations For Multi-Patch Isogeometric Analysis
Jeremias Nathanael Arf[1], Mathias Reichle[2], Myung-Jin Choi[2], Sven Klinkel[2], Bernd Simeon[1]
1: RPTU Kaiserslautern-Landau, Germany; 2: RWTH Aachen University, Germany

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A Family of Index-Reduced Stable Intrinsically Locking-Free Hierarchic Shell Formulations
Tarun Kumar Mitruka Vinod Kumar Mitruka, Manfred Bischoff
University of Stuttgart, Institute for Structural Mechanics, Pfaffenwaldring 7, 70550 Stuttgart, Germany

11:50am - 1:00pm — **Lunch Break**
Location: **Mensa Academica**

1:00pm - 1:50pm — **A Scaled Boundary Finite Element Framework for Modern Computational Engineering Analysis by Chongmin Song**
Location: **Ford Auditorium, SuperC**

1:50pm - 3:30pm — **Session 7**
Location: **Ford Auditorium, SuperC**

Polygon Elements For Phase-field Modelling Of Fracture In Brittle Polycrystals
Carolin Birk[1], Ajay Kumar Pasupuleti[1], Hirshikesh Hirshikesh[2], Sundararajan Natarajan[3]
1: University of Duisburg-Essen, Germany; 2: Indian Institute of Technology Jodhpur; 3: Indian Institute of Technology Madras

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Trimming in Isogeometric Scaled Boundary Analysis for Planar Linear Elasticity

Mathias Reichle, Sven Klinkel
RWTH Aachen University, Germany

Fast Automatic Discretization and Analysis of Solids Based on the Isogeometric Scaled Boundary Approach

David Teran[1], Julius Nehring-Wirxel[2], Leif Kobbelt[2], Margarita Chasapi[1]
1: Chair of Structural Analysis and Dynamics, RWTH Aachen University; 2: Visual Computing Institute, RWTH Aachen University

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From Polygonal Plates to Flat-Facet Shell Elements With Assumed Natural Strains in the Scaled Boundary Finite Element Framework

Anna Hellers, Mathias Reichle, Sven Klinkel
RWTH Aachen University, Germany

Power Diagram Optimization with Respect to Anisotropic Sizing Constraints

Alisa Rozdestvenskyte, Pascal Meyer, Leif Kobbelt
RWTH Aachen University, Germany

3:30pm - 4:00pm **2nd Coffee Break**
Location: **Ford Auditorium, SuperC**

4:00pm - 5:20pm **Session 8**
Location: **Ford Auditorium, SuperC**

Accurate and Automated Handling of Moving Boundaries in Fluid Flow Simulation

Marek Behr
Chair for Computational Analysis of Technical Systems, RWTH Aachen University, Germany

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Adaptive Parallel Space-time Discontinuous Galerkin Methods For The Linear Transport Equation

Christian Wieners
KIT - Karlsruhe Institute of Technology, Germany

A Quasi-asymptotically-preserving Formulation of Highly Anisotropic Diffusion Problems in the Hybridizable Discontinuous Galerkin Framework

Michel Mehrenberger[1], Tuan Dung Nguyen[1], Eric Serre[2], Frédéric Schwander[2]
1: Aix-Marseille Université, Institut de Mathématiques de Marseille, CNRS UMR 7373, Marseille, France; 2: Aix-Marseille Université, Centrale Méditerranée, Laboratoire de Mécanique, Modélisation et Procédés Propres, CNRS UMR 7340, Marseille, France

Date: Friday, 22/Aug/2025

8:30am - 9:50am

Session 9
Location: **Ford Auditorium, SuperC**

Stabilized Finite Elements and Their Application to Dispersed Multiphase Flows
Hauke Gravenkamp[1], **Ramon Codina**[2,3], **Javier Principe**[2,3]
1: Otto von Guericke University Magdeburg, 39106 Magdeburg, Germany; 2: International Centre for Numerical Methods in Engineering, 08034 Barcelona, Spain; 3: Universitat Politècnica de Catalunya, 08034 Barcelona, Spain

Petrov-Galerkin Finite Elements in Elastodynamics: A Novel Two-Field Approach
Felix Zähringer, **Peter Betsch**
Karlsruhe Institute of Technology, Germany

Mesh Distortion Resistant Serendipity Elements: Unsymmetric Formulation
Sascha Eisenträger
Otto von Guericke University Magdeburg, Germany

A Stabilization Technique Based on Reduced Integration for Virtual Elements at Finite Strains
Njomza Pacolli[1], **Jannick Kehls**[1], **Stefanie Reese**[2], **Hagen Holthusen**[3]
1: RWTH Aachen University, Germany; 2: University of Siegen, Germany; 3: FAU Erlangen-Nuremberg

9:50am - 10:20am

Coffee Break
Location: **Ford Auditorium, SuperC**

10:20am - 11:40am

Session 10
Location: **Ford Auditorium, SuperC**

Development Of Well-conditioned And Optimally Convergent High-order Generalized/eXtended Finite Element Methods Exploring Hierarchical Bases
Heloisa Zanardi[1], **Murilo H. C. Bento**[1], **Patrick O'Hara**[2], **Sergio P. B. Proença**[1]
1: Department of Structural Engineering, São Carlos School of Engineering, University of São Paulo – Brazil; 2: Structural Sciences Center, Air Force Research Laboratory – USA

Solving an X-FEM Discretization of Two-Dimensional Thermal Homogenization Problems With a Fast Fourier Transform Based Method
Flavia Gehrig[1], **Matti Schneider**[1,2]
1: University of Duisburg-Essen, Essen, Germany; 2: Fraunhofer Institute for Industrial Mathematics ITWM, Kaiserslautern, Germany

Optimization of a Rigid Baffle in a Liquid Filled Tank to Limit Sloshing Using Xfem and a Surrogate Model
Antoine Legay, **Luc Laurent**, **Christophe Hoareau**
Conservatoire national des arts et métiers, France

Solution Strategies for the Cahn-Hilliard-Biot Model
Cedric Riethmüller[1], **Erlend Storvik**[2]
1: University of Stuttgart, Germany; 2: Western Norway University of Applied Sciences, Norway

11:40am - 12:00pm

Closing
Location: **Ford Auditorium, SuperC**