

**Modern Finite Element Technologies**  
Mathematical and Mechanical Aspects  
Bad Honnef, 01-03 July 2019

**Submission of Contributions:**

Prospective authors are invited to submit contributions on any of the conference topics. Registration and submission should be performed electronically via the conference web site.

**For further information:** [www.uni-due.de/spp1748](http://www.uni-due.de/spp1748)  
[www.mfet2019.de](http://www.mfet2019.de)



European Community  
on Computational Methods  
in Applied Sciences

### Place

The Physikzentrum Bad Honnef (PBH) is operated by the Deutsche Physikalische Gesellschaft e.V. (German Physical Society) and supported by the University of Bonn and the state North Rhine-Westphalia. The stately mansion housing is surrounded by a park at the foot of the Siebengebirge ("the Seven Hills") on the right bank of the Rhine River. In the immediate neighbourhood an extensive net of hiking-paths in Germany's oldest nature preserve invites to pleasant short or long walks. Public transportation offers convenient access to nearby cities of Bonn (15 km) and Cologne (40 km) with many cultural and scientific attractions. Due to its central location PBH is easy to reach from all European countries.

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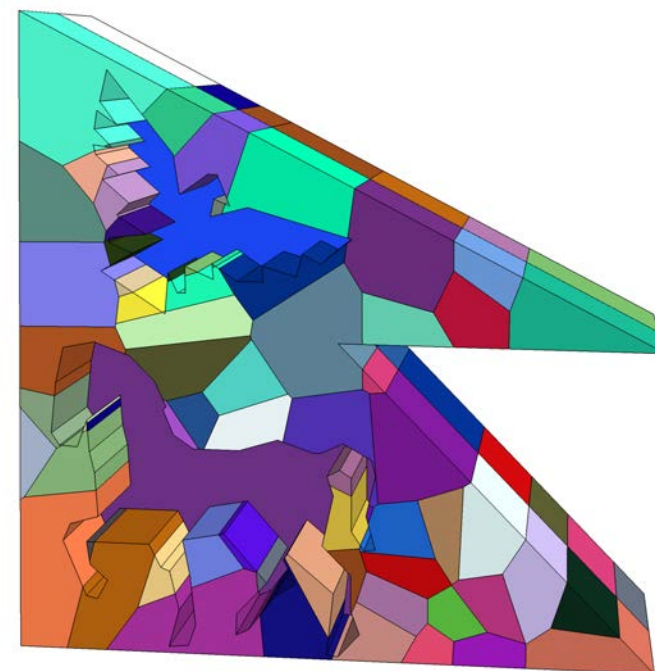
### Crosslinks

The conference series is linked to the Priority Programme 1748

**"Reliable Simulation Techniques in Solid Mechanics.  
Development of Non-standard Discretization Methods,  
Mechanical and Mathematical Analysis"**

Thus funding of the German Research Foundation (DFG) is gratefully acknowledged. Further cooperation exists with the Technical Committee of ECCOMAS "Scientific Computing".

**DFG** Deutsche  
Forschungsgemeinschaft



© Peter Wriggers, Virtual Finite Element Mesh

## Scientific Programme

Numerical simulation techniques are an essential component for the construction, design and optimization of cutting-edge technology. Examples are innovative products, new materials as well as medical-technical applications and production processes. These important developments demand numerical methods of high quality, reliability and capability. Challenges include the treatment of incompressibility, anisotropy and discontinuities. Existing computer-based solution methods often provide approximations that cannot guarantee substantial and necessary stability criteria. Especially in the field of geometrical and material non-linearities such uncertainties appear. Typical problems are insufficient or even pathological stress results due to unsuitable approximation spaces as well as weak convergence behavior because of stiffening effects or mesh distortion. Similar problems arise in the framework of crack and contact problems. Here the resolution of the local discontinuities as well as their evolution plays a key role. The thematic ECCOMAS conference has the goal to establish a platform for the scientific exchange between mechanics, mathematics and applications in the area of nonconventional discretization methods.

## Scientific Areas

The conference addresses new developments in the field of numerical simulation technologies and their mathematical analysis. The conference topics relate to the strong interplay between mathematics and mechanics - in particular for state of the art problems like geometrically and physically non-linear problems, e.g. associated with inelastic models, phase transitions or difficulties associated with anisotropies and incompressibility.

Possible scientific areas are (but not limited to):

**Mixed and hybrid finite elements**  
**Discontinuous Galerkin methods**  
**Isogeometric elements**  
**Immersed-boundary methods**  
**Least-squares finite elements**  
**Virtual elements**  
**Stochastic finite element methods**  
**Phase Field techniques**

## Important Dates

Deadline for submitting one page abstract	01 February 2019
Acceptance of the paper and instructions	15 February 2019
Deadline for submitting the full paper	31 April 2019
Deadline for early payment	01 March 2019

## Registration Fees

The registration fees, including social events, with early registration applicable if received before 01 March 2019 are (€)

	Early	Late
Delegates	550	650
Students	400	500

The fees include:

- Accommodation and full board (30.06.-03.07.)
- Book of Abstracts and CD-ROM Proceedings
- Attendance to all scientific sessions
- coffee breaks, reception and banquet

## Organizers

Jörg Schröder, Universität Duisburg-Essen, Germany  
Carsten Carstensen, Humboldt-Universität zu Berlin, Germany  
Stefanie Reese, RWTH Aachen, Germany  
Gerhard Starke, Universität Duisburg-Essen, Germany  
Peter Wriggers, Leibniz Universität Hannover, Germany  
Ferdinando Auricchio, Università degli studi di Pavia, Italy  
Antonio Huerta, Universitat Politècnica de Catalunya, Spain

## Congress Secretariat

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## Instructions for Authors

The one-page abstract, describing the main features should be submitted electronically by 01 February 2019. Please note that scheduling of contributions for oral presentation is conditional upon the acceptance of the one-page abstract and the payment of the corresponding author's conference registration fee during the advance period. Notification of acceptance will be given by February 2019.

In addition to that a non-mandatory full paper can be submitted by 15 March 2019.

The Conference Proceedings will be available on a USB-stick containing the one-page abstracts.

## Keynote Lectures

N. Aage (Denmark):  
Advanced density based topology optimization methods

F. Brezzi (Italy):  
Recent evolutions of Virtual Element Methods

J. Hu (China):  
Adaptive and multilevel mixed finite element methods

M. Vohralik (France):  
Potential and flux reconstructions for optimal a priori and a posteriori error estimates

A. J. Gil (United Kingdom):  
On the use of mixed formulations for computational polyconvexity and multi-variable convexity

## Scientific Board

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