http://gamm2019.conf.tuwien.ac.at

GESELLSCHAFT für
ANGEWANDTE MATHEMATIK und MECHANIK e.V.
INTERNATIONAL ASSOCIATION of APPLIED MATHEMATICS and MECHANICS

90th Annual Meeting

of the International Association of
Applied Mathematics and Mechanics

February 18-22, 2019
Vienna, Austria

Foto: Universität Wien | Gebhard Sengmüller

General Information & Daily Program

TECHNISCHE UNIVERSITÄT WIEN

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GAMM 2019 – Time Schedule

	Monday 18.02.19	Tuesday 19.02.19	Wednesday 20.02.19	Thursday 21.02.19	Friday 22.02.19
08:30	*Registration (starting at 09:00)*	Contributed Sessions	Contributed Sessions	Contributed Sessions	Contributed Sessions
09:00					
09:30			*Coffee Break Poster Session*		
10:00					
10:30		*Coffee Break*	**R. v. Mises Lecture**	*Coffee Break*	*Coffee Break*
11:00		**Plenary Lecture 2**		**Plenary Lecture 4**	**Plenary 7 Lecture**
11:30			**GAMM General Assembly**		
12:00		**Plenary Lecture 3**		**Plenary Lecture 5**	**Plenary Lecture 8**
12:30					
13:00	**Opening**	*Lunch*	*Lunch* / YAMM*	*Lunch*	**Closing**
13:30					
14:00	**Prandtl Lecture**	Minisymposia + DFG-PP	Contributed Sessions	Contributed Sessions	
14:30					
15:00	**Plenary Lecture 1**				
15:30					
16:00	*Coffee Break*	*Coffee Break Poster Session*	*Coffee Break*	*Coffee Break*	
16:30	Young Researchers' Minisymposia	Contributed Sessions	Contributed Sessions	**Plenary Lecture 6**	
17:00					
17:30				Contributed Sessions	
18:30					
19:00	**Welcome Reception** (Aux Gazelles)				
19:30		**Public Lecture**	**Conference Dinner** (Rathaus)		
20:00					
20:30					
21:00					

*YAMM: Young Academics in Applied Mathematics and Mechanics

Welcome from the Local Organisers

Dear participants,

a warm welcome to the 90th GAMM Annual Meeting, held in the center of Vienna at the University of Vienna.

We are grateful to our colleagues of the program committee and the organizers of the sections, young researchers' minisymposia, minisymposia, and the GAMM-related DFG priority programs for their support and for ensuring a high quality of the scientific program.

We would like to express our thanks to the Vienna University of Technology (TU Wien) and the University of Vienna for their general support. We thank the City of Vienna, Vienna Convention Bureau, Dlubal Software GmbH, De Gruyter, Pearson, Springer Vieweg, Wiley, CADFEM, and DGLR for supporting the conference.

We also sincerely thank the organizers of the GAMM 2018 Meeting in Munich for providing templates for the "General Information & Daily Program" and the "Book of Abstracts". We appreciate the efforts of the Munich team made in preparing the initial LaTeX source files.

Sincere thanks to Mag.(FH) Martina Pöll, the team of Mondial Congress, and to the local organising committee for their engagement and contributions which were of key importance for successful organisation of the conference. Finally, we thank numerous colleagues and students helping to organise this conference.

Enjoy this conference and your stay in Vienna!

Josef Eberhardsteiner

Joachim Schöberl

Welcome from the President and Secretary of the GAMM

Dear participants,

The International Association of Applied Mathematics and Mechanics (GAMM e.V.) cordially invites you to its 90th Annual Scientific Conference, from February 18 – February 22, 2019.

On behalf of the DGLR and the GAMM, we also invite you to the 62th Ludwig Prandtl Memorial Lecture.

We invite all GAMM members to the regular General Assembly of the GAMM on Wednesday, February 20, 2019.

Heike Faßbender
President

Michael Kaliske
Secretary

Local Organising Committee

Christoph Adam
Thomas Antretter
Günter Brenn
Christian Bucher
Katrin Ellermann
Thomas Fries
Johannes Gerstmayr
Philipp Gittler
Christian Hellmich
Günter Hofstetter
Gerhard Holzapfel
Hans Irschik
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Erika Hausenblas
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Karl Kunisch
Ulrich Langer
Markus Melenk
Alexander Ostermann
Ilaria Perugia
Ronny Ramlau
Andreas Schröder
Ulisse Stefanelli
Olaf Steinbach

Program Committee

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Josef Eberhardsteiner
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Heike Faßbender
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Michael Kaliske
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Dorothee Knees
Daniel Kressner
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Timo Reis
Oliver Rheinbach
Joachim Schöberl
Jörg Schröder
Gabriele Steidl
Andrea Walther
Kerstin Weinberg
Christoph Woernle

Special Events

Monday, February 18	**Opening** 13:00 – 14:00, Audimax **Ludwig Prandtl Memorial Lecture** 14:00 – 15:00, Audimax **Welcome Reception** 19:00, Aux Gazelles
Tuesday, February 19	**Poster Session** 16:00 – 16:30, Kleiner Festsaal **Public Lecture** 19:30 – 22:00, Audimax
Wednesday, February 20	**Poster Session** 09:30 – 10:30, Kleiner Festsaal **Richard von Mises Prize Lecture** 10:30 – 11:30, Audimax **General Assembly** 11:45– 13:00, BIG HS **YAMM Lunch** 13:00 – 14:00, Kleiner Festsaal **Conference Dinner** 19:30, Rathaus
Friday, February 22	**Closing** 13:00 – 14:00, Audimax

Plenary Lectures – Mathematics

Dieter Bothe (TU Darmstadt) Thursday, February 21, 11:00 – 12:00	Modeling and simulation of transport processes at fluid interfaces
Daniel Cremers (TU München) Tuesday, February 19, 11:00 – 12:00	Direct methods for camera-based 3D reconstruction & SLAM
Robert Scheichl (Universität Heidelberg) Tuesday, February 19, 12:00 – 13:00	PDE constrained Bayesian inference: when numerics meets statistics
Barry Smith (Argonne National Lab.) Monday, February 18, 15:00 – 16:00	Composable solvers in PETSc/Tao: from linear systems and differential equations to optimization

Plenary Lectures – Mechanics

Dwight Barkley (University Warwick) Thursday, February 21, 16:30 – 17:30	A fluid mechanic's analysis of the tea-cup singularity
Peter Betsch (KIT Karlsruhe) Friday, February 22, 11:00 – 12:00	History and recent developments of energy-momentum schemes
Christian Hellmich (TU Wien) Friday, February 22, 12:00 – 13:00	Towards unified hierarchical modeling of hard and soft biological tissues
Dennis Kochmann (ETH Zürich) Thursday, February 21, 12:00 – 13:00	Mechanical metamaterials

Young Researchers' Minisymposia

1	Modeling and control of Port-Hamiltonian systems	
	Organisers:	Robert Altmann (Uni Augsburg) Philipp Schulze (TU Berlin)
2	Recent advances in Galerkin methods based on polytopal meshes	
	Organisers:	Lorenzo Mascotto (Uni Wien) Steffen Weißer (Uni Saarland)
3	Recent developments in damage mechanics	
	Organisers:	Philipp Junker (Ruhr-Uni Bochum) Xiaoying Zhuang (Uni Hannover)
4	Mathematical theory of deep learning	
	Organisers:	Rafael Reisenhofer (Uni Wien) Philipp Petersen (TU Berlin)
5	Multi-physics modeling of elastomers	
	Organisers:	Vu Ngoc Khiêm (RWTH Aachen) Markus Mehnert (Uni Erlangen-Nürnberg)

Minisymposia

1	Mathematical modeling, analysis and simulation of drug distribution for efficient pharmacotherapy	
	Organisers:	Jurjen Duintjer Tebbens (Uni Prag) Elfriede Friedmann (Uni Heidelberg)
2	Topology optimization of structures considering elaborate constraints and variables	
	Organisers:	Thomas Vietor (TU Braunschweig) Axel Schumacher (BU Wuppertal) Sierk Fiebig (Volkswagen, Braunschweig)
3	Research software and -data: How to ensure replicability, reproducibility, and reusability	
	Organisers:	Jörg Fehr (Uni Stuttgart) Christian Himpe (MPG Magdeburg)
4	Coupled problems in rotating machinery	
	Organisers:	Wolfgang Seemann (KIT Karlsruhe) Aydin Boyaci (ABB AG) Dominik Kern (TU Chemnitz)
5	Input-to-state stability of distributed parameter systems	
	Organisers:	Andrii Mironchenko (Uni Passau) Felix Schwenninger (Uni Hamburg)

2	PP 1748: Reliable simulation techniques in solid mechanics. Development of non-standard discretization methods, mechanical and mathematical analysis	
	Organisers:	Jörg Schröder (Uni Duisburg-Essen) Thomas Wick (Uni Hannover)
2	PP 1798: Compressed sensing in information processing (CoSIP)	
	Organisers:	Gitta Kutyniok (TU Berlin) Rudolf Mathar (RWTH Aachen)
3	PP 1886: Polymorphic uncertainty modelling for the numerical design of structures	
	Organiser:	Michael Kaliske (TU Dresden)
4	PP 1897: Calm, smooth and smart – Novel approaches for influencing vibrations by means of deliberately introduced dissipation	
	Organiser:	Peter Eberhard (Uni Stuttgart)
5	PP 1962: Non-smooth and complementarity-based distributed parameter systems: simulation and hierarchical optimization	
	Organiser:	Michael Hintermüller (Weierstraß-Institut Berlin)
6	PP 2020: Cyclic deterioration of high-performance concrete in an experimental - virtual lab	
	Organiser:	Ludger Lohaus (Uni Hannover)

Sections

S 1	Multi-body dynamics	
	Organisers:	Michael Krommer (TU Wien) Johannes Gerstmayr (Uni Innsbruck)
S 2	Biomechanics	
	Organisers:	Markus Böl (TU Braunschweig) Alexander Ehret (EMPA, ETH Zürich)
S 3	Damage and fracture mechanics	
	Organisers:	Andreas Ricoeur (Uni Kassel) Stephan Wulfinghoff (Uni Kiel)
S 4	Structural mechanics	
	Organisers:	Manfred Bischoff (Uni Stuttgart) Sven Klinkel (RWTH Aachen)
S 5	Nonlinear oscillations	
	Organisers:	Katrin Ellermann (TU Graz) Leo Dostal (TU Hamburg-Harburg)
S 6	Material modelling in solid mechanics	
	Organisers:	Thomas Antretter (MU Leoben) Clara Schuecker (MU Leoben)
S 7	Coupled problems	
	Organisers:	Detlef Kuhl (Uni Kassel) Ralf Jänicke (Chalmers University of Technology)
S 8	Multiscales and homogenization	
	Organisers:	Benjamin Klusemann (Uni Lüneburg) Dennis Kochmann (ETH Zürich)
S 9	Laminar flows and transition	
	Organisers:	Bruno Eckhardt (Uni Marburg) Björn Hof (IST Austria)
S 10	Turbulence and reactive flows	
	Organisers:	Bettina Frohnapfel (KIT Karlsruhe) Arne Scholtissek (TU Darmstadt)
S 11	Interfacial flows	
	Organisers:	Tatiana Gambaryan-Roismann (TU Darmstadt) Rodica Borcia (BTU Cottbus)
S 12	Waves and acoustics	
	Organisers:	Manfred Kaltenbacher (TU Wien) Barbara Kaltenbacher (Alpen-Adria Uni Klagenfurt)

Sections

S 13	Flow control	
	Organisers:	Wolfgang Schröder (RWTH Aachen) Bernd Noack (Limsi, France)
S 14	Applied analysis	
	Organisers:	Ulisse Stefanelli (Uni Wien) Patrick Dondl (Uni Freiburg)
S 15	Uncertainty quantification	
	Organisers:	Hanno Gottschalk (Uni Wuppertal) Claudia Schillings (Uni Mannheim)
S 16	Optimization	
	Organisers:	Christian Kirches (TU Braunschweig) Christian Clason (Uni Duisburg-Essen)
S 17	Applied and numerical linear algebra	
	Organisers:	Oliver Rheinbach (TU Freiberg) Alexander Heinlein (Uni Köln)
S 18	Numerical methods for differential equations	
	Organisers:	Ilaria Perugia (Uni Wien) Mario Ohlberger (Uni Münster)
S 19	Optimization of differential equations	
	Organisers:	Kathrin Welker (HSU/UniBw Hamburg) Winnifried Wollner (TU Darmstadt)
S 20	Dynamics and control	
	Organisers:	Sergio Lucia (TU Berlin) Roman Geiselhart (Uni Ulm)
S 21	Mathematical signal and image processing	
	Organisers:	Otmar Scherzer (Uni Wien) Gwenael Mercier (Uni Wien) Clemens Kirisits (Uni Wien)
S 22	Scientific computing	
	Organisers:	Jens Saak (MPI Magdeburg) Hartwig Anzt (KIT Karlsruhe)
S 23	Applied operator theory	
	Organisers:	Olaf Post (Uni Trier) Jonathan Rohleder (Stockholm University)
S 24	History of mechanics and history, teaching and popularization of mathematics	
	Organisers:	Dietmar Gross (TU Darmstadt) Otto T. Bruhns (Ruhr-Uni Bochum)

YAMM: Young Academics in Applied Mathematics and Mechanics
Wednesday, February 20, 13:00 – 14:00
Kleiner Festsaal

Organisers:	Johanna Eisenträger (OvGU Magdeburg) Tobias Kaiser (TU Dortmund) Christoph Meier (TU München)
Experts:	Martin Arnold (MLU Halle-Wittenberg) Fleurianne Bertrand (Uni Duisburg-Essen) Manfred Bischoff (Uni Stuttgart) Heike Faßbender (TU Braunschweig) Jörg Fehr (Uni Stuttgart) Barbara Kaltenbacher (Alpen-Adria Uni Klagenfurt) Sandra May (TU Dortmund) Philipp Morgenstern (Leibniz Uni Hannover) Alexander Popp (Uni Bundeswehr München) Stefanie Reese (RWTH Aachen) Wolfgang A. Wall (TU München) Thomas Wick (Leibniz Uni Hannover)

Poster Session of the GAMM Juniors
Tuesday, February 19, 16:00 – 16:30
Wednesday, February 20, 09:30 – 10:30
Kleiner Festsaal

Organiser:	Rafael Reisenhofer (Uni Wien)

Posters:	A. Buenger: *Information about the GAMM student chapter Chemnitz* J. Eisenträger: *A phase mixture model for martensitic steels* M. Franke: *Mixed frameworks and structure preserving integration for coupled electro-elastodynamics* P. Gangl: *Topology and shape optimization with application to electrical machines* M. Genzel: *Sparse recovery from superimposed non-linear measurements* C. Gräßle: *Adaptivity in model order reduction with proper orthogonal decomposition* D. R. Jantos: *Structural and material optimization based on thermodynamic principles* T. Kaiser: *On symmetry group evolution in finite plasticity* S. Lange: *The condensed method: an efficient approach to investigate constitutive behaviors, phase transitions and high-cycle fatigue of polycrystalline ferroelectric, ferromagnetic or multiferroic materials* L. Lambers: *A multiscale model of processes in the human liver* K. Lux: *Optimal inflow control in supply systems with uncertain demands* R. J. Martin: *History of logarithmic strain measures in nonlinear elasticity* P. Mlinarić: *Model order reduction of multi-agent systems* P. Morgenstern: *Unstructured T-splines based on local higher-dimensional mesh representations* L. Pauli: *Blood damage estimation for medical device design* L. Scheunemann: *Multiscale modeling of dual phase steels* P. Schulze: *Structure-preserving model reduction for the advection-diffusion equation* B. Unger: *Data-driven modeling of systems with prescribed structure* K. Welker: *Shape optimization in shape spaces*

Ludwig Prandtl Memorial Lecture Monday, February 18, 14:00 – 15:00	
Hendrik Kuhlmann (TU Wien, Austria)	Finite-size Lagrangian coherent structures
Richard von Mises Lecture Wednesday, February 20, 10:30 – 11:30	
The Awardee will be announced on February 18.	
Public Lecture Tuesday, Febraury 19, 19:30 – 22:00	
Helmut Pottmann (KAUST, Saudi-Arabia / TU Wien, Austria)	Architectural geometry

On-Site Information

Conference Venue

Scientific events will take place in the **Main Building of the University of Vienna** (Universitätsring 1, 1010 Vienna) which is located in the center of the city. The Registration Desk is located at the main entrance.
The conference venue can be easily reached by public transport (metro line U2, tram lines 1, 2, D, 37, 38, 40, 41, 42, 43, and 44) and from Vienna International Airport, which provides direct flights to over 170 destinations worldwide.

Certificate of Participation

All participants will receive a certificate of participation by e-mail after the conference.

Cloak Room & Luggage Storage

In nearly all lecture rooms coat hooks are available. In addition, separate cloack rooms and a luggage storage are located in the lower level (see map).

Date	*Opening Hours*
Monday, February 18	11:30 – 19:00
Tuesday, February 19	08:00 – 22:30
Wednesday, February 20	08:00 – 19:00
Thursday, February 21	08:00 – 19:00
Friday, February 22	08:00 – 14:00

Coffee Breaks

Coffee, tea, soft drinks, fruits, and biscuits will be served in the "Festsaal" as well as in "Hof 8" and the "Student Space" (Tue-Thu) in the lower level.

Conference App

The Conference4me smartphone app provides you with the most comfortable tool for planning your participation at GAMM 2019. Browse the complete program directly from your phone or tablet and create your very own agenda on the fly. The app is available for Android, iOS, Windows Phone.
To download the mobile app, please visit
http://conference4me.eu/download or type 'conference4me' in Google Play, iTunes App Store, Windows Phone Store or Amazon Appstore. More information can be found here http://conference4me.eu/ download

Conference Staff

The Mondial Congress & Events team members are present at the registration counter. Technical staff is present in all lecture rooms. Conference hostesses are present throughout the conference venue. Do not hesitate to approach them with queries – they will gladly assist you.

Exhibition	The Exhibition Area is located in the Festsaal. *Date* — *Opening Hours* Monday, February 18 — 16:00 – 18:30 Tuesday, February 19 — 08:30 – 18:30 Wednesday, February 20 — 08:30 – 18:30 Thursday, February 21 — 08:30 – 18:30 Friday, February 22 — 08:30 – 11:00
Internet Access	In addition to the Eduroam network, a personalized wireless internet access is available. Usernames and passwords will be handed over at the registration desk.
Latest Program Changes	Latest changes to the program will be communicated at the registration desk or through the conference app.
Lockers	In case you want to lock your hand bag or jacket, please use the "Lockers" on the lower level.
Lost & Found	Participants can collect their lost items or leave found items at the registration desk.
Lunch	Please see possibilities for lunch on page 20.
Medical Service	The emergency medical service is located in the basement (vis-a-vis room SR05). In case of an emergency, please contact the conference staff.
Name Badge	Participants are kindly asked to wear and display their name badge at all times in order to access the conference venue and social events.
Parking	There is no car parking available at the University of Vienna. In the city center of Vienna, parking charges apply. If you arrive by car, you can use the nearby parking garages: Votivpark-Garage €4.20/h (maximum per day: €42.00) Parkgarage Rathauspark: €4.00/h (maximum per day: €40.00)
Payment	All payments need to be made in Cash in EUR (€) or by debit/credit card. VISA, MASTERCARD, MAESTRO, DINERS and AMEX will be accepted. Unfortunately, we cannot accept traveller cheques, other credit cards, eurocheques, or any other currencies. Please note that there is no currency exchange possibility at the conference venue. An ATM can be used in the lower level (see map) or in the surrounding area of the conference venue.

Registration Information

For registration and collection of conference materials, please visit the registration area at the main entrance of the Main Building. Registration Tel.: +43 676 845 880 706

Date	*Opening Hours*
Monday, February 18	09:00 – 19:00
Tuesday, February 19	08:00 – 18:00
Wednesday, February 20	08:00 – 18:00
Thursday, February 21	08:00 – 18:00
Friday, February 22	08:00 – 12:00

Registration Counters:

- **Pre-Registrations:** Please note that all registration documents have been prepared for pre-registered participants and sorted by last name. Therefore, when approaching the appropriate registration counter make sure to clearly state your last name (family name) under which you have registered. Please have your confirmation letter and ID close at hand.
- **On-Site Registration / Open Payments:** For participants registering and paying their registration fees on-site or with an outstanding payment.

Smoking

Due to the non-smoking policy in public buildings, smoking is prohibited in the conference venue. There are some smoking areas in the Arcade Court of the Main Building.

Social Events & Guided Tours

Information about social events as well as the vouchers for the purchased tickets can be obtained from the “Pre-Registration" counter. Please make sure to bring the voucher along to the event.

Streaming

The Opening Ceremony, all Plenary Lectures, the Ludwig Prandtl Memorial Lecture, and the Richard von Mises Lecture will be streamed from Audimax to BIG HS.

Transportation in Vienna

Travel to the Conference Venue

- **From ’Westbahnhof’ train station:** U3 direction to ”Simmering”, get off at ”Volkstheater”, then change to U2 direction to ’Aspernstraße’ and get off at ’Schottentor’
- **From ’Hauptbahnhof’ train station:** U1 direction to ”Leopoldau”, get off at ”Karlsplatz”, then change to U2 direction to ’Aspernstraße’ and get off at ’Schottentor’
- **From Vienna International Airport (Schwechat):** A Vienna Airport Lines/Postbus bus (line 1185) goes from Vienna International Airport straight to ”Morzinplatz”, close to tram station 1 ”Salztorbrücke” (duration of the journey approximately 38 minutes). Take the tram line 1 direction to ”Stefan-Fadinger-Platz” and exit the tram at ”Schottentor”. The university is to your right hand side.

Public Transport

The Viennese public transport network provides modern and efficient accessibility within the city limits, making it easy for delegates to explore Vienna by bus, tram or metro. On weekends metro operates at least every 15 minutes through the night from Friday morning to Sunday evening. The University of Vienna is located in the immediate vicinity of the underground station Schottentor of line U2 and the tram stations of lines 1, 2, 37, 38, 40, 41, 42, 43, and D.

Welcome Reception

The Welcome Reception will take place at Aux Gazelles (Rahlgasse 5) on Monday, February 18, starting at 19:00. You can reach Aux Gazelles within 15 min. by U2 direction to "Karlsplatz", get off at "Museumsquartier" or approx. 20 mins. walking. Please do not forget to take your name badge with you. Otherwise you will not be allowed to enter the venue. You have received three vouchers for drinks – please do not forget them as well. Additional drinks have to be paid separately.

Conference Dinner

The Conference Dinner hosted by the Mayor of the City of Vienna, will take place at the picturesque Rathaus (City Hall) (Lichtenfelsgasse 2) on Wednesday, February 20, starting at 19:30. Entrance at 19:00.

Where to have Lunch

At the Venue

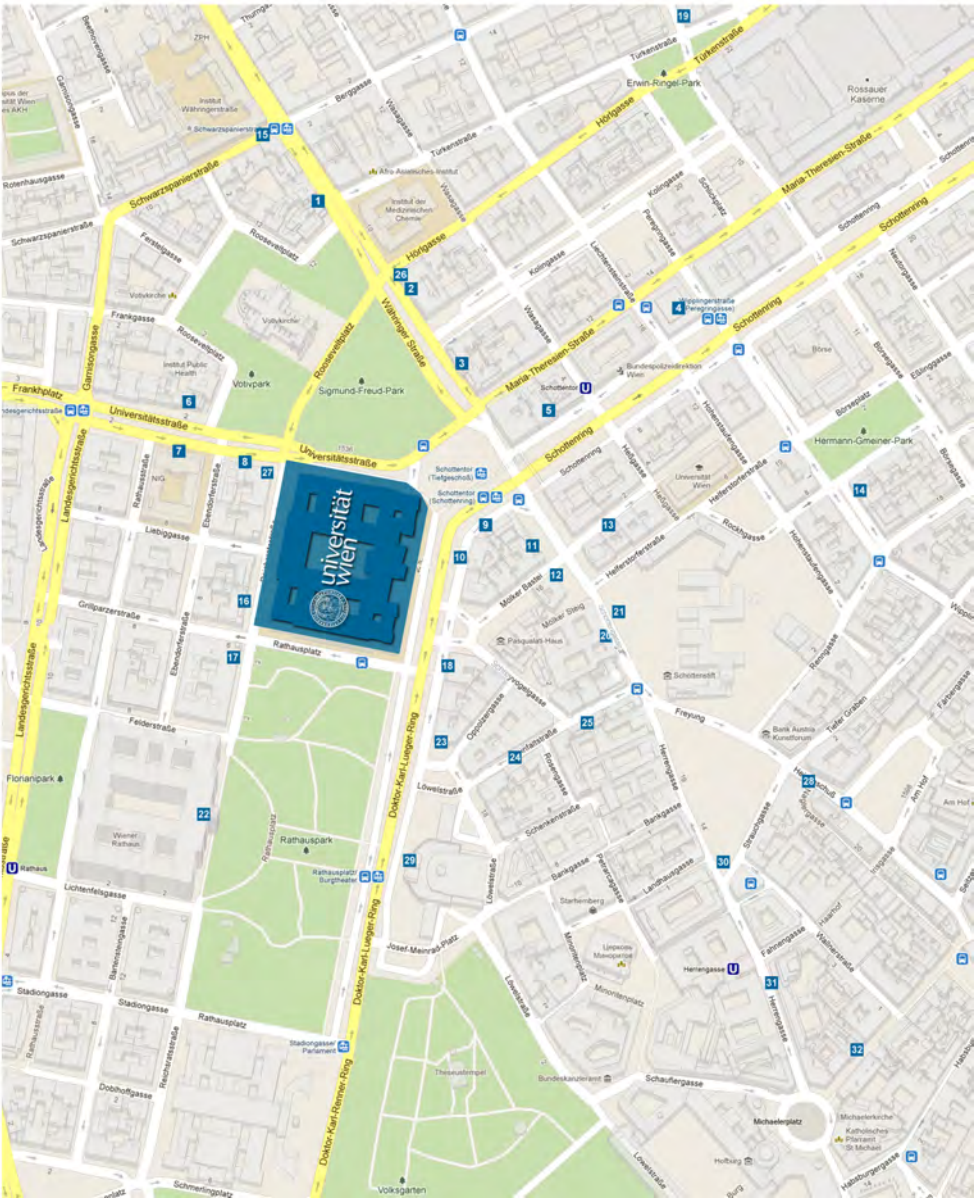
Inside the conference venue there are three possibilites to have lunch:

Name	*Opening Hours*	*Location*
[7] Mensa	11:00 – 14:00 (open Tue-Thu)	Neues Institutsgebäude (NIG)
Barke's Audimax Cafe	07:00 – 20:00	vis-a-vis Audimax
Suppenbar / Soup bar	13:00 – 14:00 (open Tue-Thu)	Hof 8

Nearby

We recommend the following restaurants in the near vicinity:

Name	*Cuisine*	*Walking Distance*
[1] Restaurant Roth	Viennese	7 min.
[2] Café Stein	Viennese	6 min.
[3] Aida Prousek & Co	Confectionery	6 min.
[4] Émile Brasserie & Bar	French, Bar	6 min.
[5] Hotel de France, Rest. #3	Viennese, French	4 min.
[6] Cafetteria Maximilian	Viennese Café	5 min.
[8] Zwillings G'wölb	Viennese	3 min.
[9] Testa Rossa Caffébar	Italian	5 min.
[10] McDonald's	Snacks	3 min.
[11] Starbucks	Snacks	5 min.
[12] Restaurant Leupold	Viennese	5 min.
[13] Appiano - das Gasthaus	Viennese, Italian	5 min.
[14] Soupkultur	Snacks	9 min.
[15] Zuppa	International	8 min.
[16] Michl's Café Restaurant	Viennese	3 min,
[17] Einstein	Viennese	3 min.
[18] Yamm!	Viennese	3 min.
[19] Pizzeria Riva	Italian	11 min.
[20] Radatz	Snack	6 min.
[21] Café Diglas im Schottenstift	Viennese Café	6 min
[22] Wiener Rathauskeller	Viennese	5 min.
[23] Café Landtmann	Viennese	4 min.
[24] Ebi I	Asian	6 min.
[25] Vollwertrestaurant Lebenbauer	Vegetarian	6 min.
[26] Café Français	French	6 min.
[27] Café Votiv	Viennese Café	2 min.
[28] Akakiko	Asian	9 min.
[29] Restaurant Vestibül	Austrian	8 min.
[30] Café Central	Viennese Café	9 min.
[31] Vapiano	Italian	10 min.
[32] K.u.K. Hofzuckerbäcker Demel	Confectionery	13 min.


universität wien
Universitätsstraße
Rathausplatz
Doktor-Karl-Lueger-Ring
Doktor-Karl-Renner-Ring
Schottenring
Schottentor
Maria-Theresien-Straße
Hörlgasse
Währinger Straße
Rooseveltplatz
Votivpark
Sigmund-Freud-Park
Rathauspark
Volksgarten
Josef-Meinrad-Platz
Schauflergasse
Michaelerplatz
Hermann-Gmeiner-Park
Erwin-Ringel-Park
Frankhplatz
Florianipark
Freyung
Herrengasse
Stadiongasse
Schwarzspanierstraße
Universitätsstraße

Guidelines for Presenters & Chairs

Information for Presenters	• Please check the time and lecture room of your presentation in the daily program and on the info boards as there might have been changes. • Technical staff is assigned to each lecture room for help with technical equipment. • Each lecture room is equipped with a computer (Windows 10, Microsoft Office 2016, Acrobat Reader DC) and a beamer. Your slides shall be prepared in the format of 16:9, whereas 4:3 is also possible. • Please only upload your slides at the day of your presentation, as all computers will be automatically cleared during the night. • You are asked to upload your presentation at the very latest in the break before the session. • Please be present at least 10 minutes prior to the start of your session and let the chairperson know you are there. • Please make sure to stay in your session from the beginning on in order to ensure smooth changes between the individual presentations. • The time allotted for the presentations is – 20 min. (incl. discussion) for presentations in sections, MS, YRM, DFG-PP sessions, – 40 min. (incl. discussion) for Topical & Keynote Lectures in sections, MS, YRM, DFG-PP sessions, and – 60 mins. for Plenary, Ludwig Prandtl Memorial, and Richard von Mises Lectures. • The chairpersons are requested to stop presentations after the allotted time has passed.
Information for Chairs	• You are kindly asked to switch between presentations by simply announcing the name of the next presenter and the title of the presentation. Due to the tight schedule, there will not be sufficient time for introducing individual lecturers in a more detailed manner. • Please do your best to strictly limit the duration of each presentation and discussion to the allotted time. • If a lecturer is missing, please stick to the original program, i.e., extend the discussion time of the preceding presentation or allow a break for the duration of the missing lecture(s). This enables participants to move in between sessions and to listen to chosen individual lectures according to the announced sequence.
Poster Size	The maximum poster size is DIN A0 portrait (841 x 1189 mm), otherwise you will have problems in mounting the poster on the provided boards.

Monday, February 18

09:00	**Registration | Collection of conference material**	
	Main Entrance	Registration desk opens
13:00	**Opening**	
	Audimax	String quartette of Orchestra of TU Wien Local Organizer, Vice-Rector TU Wien: *Josef Eberhardsteiner* Vice-Rector Uni Wien: *Regina Hitzenberger* GAMM President: *Heike Faßbender* Announcement of the Richard von Mises Awardee
14:00	**Ludwig Prandtl Memorial Lecture**	
	Audimax	**Hendrik Kuhlmann** (TU Wien) *Finite-size Lagrangian coherent structures* Chaired by Martin Oberlack
15:00	**Plenary Lecture – Mathematics**	
	Audimax	**Barry Smith** (Argonne National Laboratory) *Composable solvers in PETSc/Tao: from linear systems and differential equations to optimization* Chaired by Axel Klawoon
16:00	**Coffee Break**	
	Festsaal, Hof 8	Refreshment including coffee, tea, soft drinks, fruits, and biscuits
16:30	**Young Researcher' Minisymposia**	
	BIG HS, HS 07, HS 21, HS 31, HS 41	5 parallel minisymposia
18:30	**Welcome Reception**	
	Aux Gazelles	Information and guidance on how to reach Aux Gazelles available on page 19

Young Researchers' Minisymposia

	YRM1 **Modeling and control of Port-Hamiltonian systems** Chair: R. Altmann, P. Schulze	YRM2 **Recent advances in Galerkin methods based on polytopal meshes** Chair: L. Mascotto	YRM3 **Recent developments in damage mechanics** Chair: P. Junker, X. Zhuang
	HS 31	**BIG HS**	**HS 21**
16:30	Dimension- and complexity-reduction for nonlinear partial differential port-Hamiltonian equations preserving an energy interpretation B. Liljegren-Sailer, N. Marheineke	Discontinuous Galerkin methods for the biharmonic problem on polygonal and polyhedral meshes Z. Dong	Wear mechanism of hard phase containing materials A. Röttger
16:50		Adaptive virtual element methods for parabolic problems using general polygonal meshes O. Sutton, A. Cangiani, E. Georgoulis	On the regularization of ductile damage models K. Langenfeld, J. Mosler
17:10	Trajectory control of an elastic manipulator based on the discretized port-Hamiltonian model M. Wang, P. Kotyczka	Building bridges between Galerkin methods on polytopal meshes S. Lemaire	Defects detection for piezoelectric materials using isogeometric symmetric Galerkin boundary element method and level sets B. Nguyen, S. Nanthakumar, X. Zhuang
17:30		Nonconforming Trefftz virtual element method for the Helmholtz problem A. Pichler, I. Perugia, L. Mascotto	An improved numerical treatment for gradient-enhanced and brittle damage modeling S. Schwarz, D.R. Jantos, K. Hackl, P. Junker
17:50	Numerical approximation of heat transfer on heterogenous media T. Scheuermann, P. Kotyczka	Discontinuous Galerkin approximation of flows in fractured porous media on polytopal meshes C. Facciolà, P.F. Antonietti, M. Verani	Phase field modeling of Hertzian indentation fracture M. Strobl, T. Seelig
18:10		Zienkiewicz-Zhu-type error estimator on polygonal meshes D. Seibel, S. Weißer	An anisotropic brittle damage model with a damage tensor of second order using a micromorphic approach M. Fassin, R. Eggersmann, S. Wulfinghoff, S. Reese

YRM4 Mathematical theory of deep learning Chair: R. Reisenhofer, P. Petersen HS 41	YRM5 Multi-physics modeling of elastomers Chair: V.N. Khiêm, M. Mehnert HS 07	
Deep convolutional networks from sparse coding principles J. Sulam, A. Aberdam, M. Elad	Fracture simulation by the phase-field method for polymeric materials considering rate-dependent properties B. Yin, M. Kaliske	**16:30**
Optimal approximation for Wilson bases with ReLU neural networks D. Perekrestenko	Coupled thermomechanical model for strain induced crystallization in polymers S. Aygün, S. Klinge	**16:50**
Approximation spaces of deep neural networks F. Voigtlaender	Thermo-micromechanics of strain-induced crystallization based on the analytical network-averaging concept V.N. Khiêm, M. Itskov	**17:10**
Deep learning for inverse problems. Where are we, and how far can we go? J. Adler, O. Öktem	Modeling electro-elastic coupling phenomena of electroactive polymers in the context of structural mechanics E. Hansy-Staudigl, M. Krommer, Y. Vetyukov, A. Humer	**17:30**
Gabor frames and deep scattering networks in audio processing R. Bammer, M. Dörfler	Electro-mechanical characterization of VHB 4905 M. Mehnert, M. Hossain, P. Steinmann	**17:50**
Invertible neural networks J. Behrmann	Reduced-order modelling and computational homogenisation of magnetorheological elastomers B. Brands, D. Davydov, J. Mergheim, P. Steinmann	**18:10**

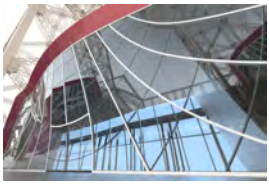
Tuesday, February 19

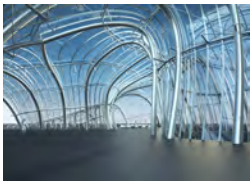
08:30	**Contributed Sessions**	
	all lecture rooms	21 parallel sessions
10:30	**Coffee Break**	
	Festsaal, Hof 8, Student Space	Refreshment including coffee, tea, soft drinks, fruits, and biscuits
11:00	**Plenary Lecture – Mathematics**	
	Audimax	**Daniel Cremers** (TU München) *Direct methods for camera-based 3D reconstruction & SLAM* Chaired by Jan Modersitzki
12:00	**Plenary Lecture – Mathematics**	
	Audimax	**Robert Scheichl** (Uni Heidelberg) *PDE constrained Bayesian inference: when numerics meets statistics* Chaired by Guido Kanschat
13:00	**Lunch**	
		Information on lunch options is available on page 20
14:00	**Minisymposia**	
	BIG HS, HS 01, HS 21 HS 34, HS 50	5 parallel minisymposia
	DFG Priority Programs	
	HS 02, HS 07, HS 31, HS 32, HS 41, HS 42	6 parallel sessions
16:00	**Coffee Break and Poster Session**	
	Festsaal, Hof 8, Student Space	Refreshment including coffee, tea, soft drinks, fruits, and biscuits
16:30	**Contributed Sessions**	
	all lecture rooms	24 parallel sessions

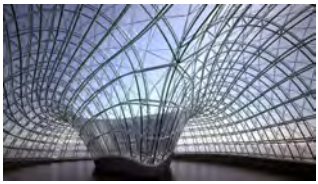
19:30	**Public Lecture**	
	Audimax	**Helmut Pottmann** (KAUST, Saudi-Arabia / TU Wien, Austria) *Architectural geometry*

Many of today's most striking buildings are nontraditional freeform shapes. The geometric design of such shapes is well understood, but their realization on the architectural scale is a big challenge. It does not fit well into the traditional sequential workflow of the construction industry. Early stage design focusses on the geometry without sufficiently considering core aspects of engineering and fabrication. This may lead to multiple design changes and a possibly dramatic increase of building costs. We will discuss freeform geometry which is buildable on the architectural scale and address "smart" design tools that assist the user in modeling geometric shapes, while automatically taking into account manufacturing, statics, material economy, and other aspects which have implications on buildability and cost. We will also elaborate on the close relations to contemporary research in geometry and computer graphics, and illustrate the successful usage of architectural geometry research in several prestigious projects.

Some representative images from our research (the first two from the Eiffel Tower Pavilions; the remaining from research)







S02.01 Biomechanics Chair: M. Böl HS 01	S03.01 Damage and fracture mechanics Chair: M. Kästner HS 50	S04.01 Structural mechanics Chair: M. Bischoff Audimax	
Challenges and perspectives in brain tissue testing and modeling S. Budday, G.A. Holzapfel, P. Steinmann, E. Kuhl	A phase-field model of brittle fracture for an isogeometric Reissner-Mindlin shell formulation G. Kikis, M. Ambati, L. De Lorenzis, S. Klinkel	Transformations and enhancement approaches for the large deformation EAS-method R. Pfefferkorn, P. Betsch	08:30
	An FFT-based solver for brittle fracture on heterogeneous microstructures F. Ernesti, M. Schneider, T. Böhlke	On the relaxation of continuity conditions for finite element schemes based on a least-squares approach M. Igelbüscher, J. Schröder	08:50
The multiphysics of prion-like disease: spreading and atrophy in neurodegeneration A. Schäfer, L. Noel, J. Weickenmeier, A. Goriely, E. Kuhl	Phase field modeling of interface effects on cracks in heterogeneous materials C. Kuhn, R. Müller	Selective strain scaling for tetrahedral finite elements A. Tkachuk, M. Bischoff	09:10
Modeling disease-dependent elastic fiber degradation in aortic dissection M. Rolf-Pissarczyk, K. Li, G.A. Holzapfel	A new framework to simulate fatigue fracture in brittle materials P. Carrara, M. Ambati, R. Alessi, L. De Lorenzis	Application of the fast nonlinear analysis method on a clamped beam with a cubic spring Ö. Akar, K. Willner	09:30
A computational model for soft biological tissues considering the influence of injury on growth and remodelling M. Gierig, M. Marino, P. Wriggers	Phase field modeling of dynamic brittle fracture of thin shells K. Paul, C. Zimmermann, K.K. Mandadapu, T.J. Hughes, C.M. Landis, R.A. Sauer	Large deformation tangential-displacement normal-normal-stress elements A.S. Pechstein	09:50
Modeling of the corrosion-fatigue behaviour of biodegradable magnesium alloys S. Ma, B. Markert	Peridynamic investigation of dynamic brittle fracture S. Butt, G. Meschke	Analysis-suitable CAD models based on watertight Boolean operations B. Marussig, B. Urick, E. Cohen, R.H. Crawford, T.J. Hughes, R.F. Riesenfeld	10:10

Contributed Sessions

	S04.02 **Structural mechanics** Chair: S. Klinkel	S05.01 **Nonlinear oscillations** Chair: K. Ellermann	S06.01 **Material modelling in solid mechanics** Chair: T. Antretter
	SR 04	**HS 16**	**BIG HS**
08:30	A meshfree method fulfilling the conditions on Galerkin solution schemes C. Weißenfels	From cybernetics to mechatronics - seven decades of interdisciplinary engineering W. Schiehlen	A thermomechanical modelling framework for selective laser melting based on phase transformations I. Guschke, T. Bartel, A. Menzel
08:50	Peridynamic Petrov-Galerkin method: a generalization of the peridynamic theory of correspondence materials T. Bode, C. Weißenfels, P. Wriggers		A variational material model for shape memory alloys under thermal cycling J. Waimann, K. Hackl, P. Junker
09:10	Bulk and shear properties of architected, two-dimensional artificial materials as a function of their inner lattice design N. Karathanasopoulos	Sensitivity in machining systems P. Eberhard, D. Hamann	Martensitic transformation at a crack under mode I and II loading S.D. Schmidt, W. Dornisch, R. Müller
09:30	Energy absorption of re-entrant auxetic structures: a parametric study N.R. Mekala, J. Bühring, N. Jafarzadeh Aghdam, K. Schröder	Chatter stability analysis for milling processes R. Binder, K. Ellermann, H. Sehrschön	Modeling of electric field-induced magnetization switching in multiferroic heterostructures W. Dornisch, R. Müller
09:50	Numerical investigations about the use of lattice structures in energy absorbing systems J. Bühring, N. Jafarzadeh Aghdam, N.R. Mekala, K. Schröder	Nonlinear dynamical systems excited by large amplitude random loads L. Dostal	Open problems in constitutive modelling of martensite M. Petersmann, T. Antretter, G. Cailletaud, A. Sannikov
10:10	Macroscopic modeling of open cell foams S. Kirchhof, A. Ams	Vibrations of an alpine ski under structural randomness R. Eberle, M. Oberguggenberger	

S07.01 **Coupled problems** Chair: P. Birken **HS 21**	S08.01 **Multiscales and homogenization** Chair: B. Klusemann **HS 41**	S09.01 **Laminar flows and transition** Chair: B. Hof **HS 03**	
On the motion of a bubble-soap: the Navier-Stokes equations coupled with surface tension forces on an immersed interface S. Court	A short tour through continuum micromechanics and multiscale modeling of inhomogeneous materials H.J. Böhm	A network of invariant solutions underlying spatio-temporal patterns in inclined layer convection T.M. Schneider	**08:30**
A concept for aortic dissection with fluid-structure-crack interaction R. Schussnig, T. Fries			**08:50**
Solid-fluid coupling in a fully Lagrangian framework J. Bender, J. Kuhnert	A Hashin-Shtrikman type semi-analytical homogenization procedure in multiscale modeling to account for coupled problems D. Jaworek, S. Wulfinghoff, S. Reese	Dimension of the attractor in weakly turbulent Taylor-Couette flow R. Gerlach, M. Dellnitz, D. Feldmann, M. Avila	**09:10**
A novel multi-vector interface quasi-Newton method for partitioned fluid-structure interaction T. Spenke, N. Hosters, M. Behr	Damage simulation of fibre reinforced composites using mean-field homogenization methods P. Lenz, R. Mahnken	Dynamic feedback control of edge states in plane Poiseuille flow B. Eckhardt, F. Knierim, M. Linkmann	**09:30**
Model order reduction of parameterised monolithic fluid-structure interaction D. Baroli, A. Zilian	Computational homogenisation of thermo-inelastic composites with an emphasis on weak micro-periodicity R. Berthelsen, A. Menzel	Asymptotic suction boundary layer: alternative linear and weakly non-modal stability modes A. Yalcin, M. Oberlack	**09:50**
Numerical solution of viscoelastic fluid-structure-diffusion systems with applications in ophthalmology A. Drobny, E. Friedmann	Homogenization of stiffness and eigenstresses/eigenstrains of matrix-inclusion composites N. Jimenez Segura, B. Pichler, C. Hellmich	Symmetry-induced unstable modes and transient growth in a Taylor-Couette type model problem T. Gebler, M. Oberlack	**10:10**

	S11.01 Interfacial flows Chair: T. Gambaryan-Roisman HS 02	S12.01 Waves and acoustics Chair: B. Kaltenbacher HS 34	S13.01 Flow control Chair: B. Noack SR 07
08:30	Bubble-particles collision and attachment in laminar and turbulent flows A. Sommer, M. Eftekhari, A. Javadi, S. Heitkam, K. Schwarzenberger, K. Eckert	Evaluation of source signature during Full Waveform Inversion for seismic reconnaissance in tunneling C. Riedel, K. Musayev, M. Baitsch, K. Hackl	Machine learning of interpretable nonlinear models for unsteady flow physics S.L. Brunton, J.N. Kutz, J. Loiseau, B.R. Noack
08:50		Initial source estimation of the wave equation with applications to photoacoustic tomography A. Beigl, J. Sogn, O. Scherzer, W. Zulehner	
09:10	Oscillating hydrogen bubbles at microelectrodes A. Bashkatov, X. Yang, S. Hossain, G. Mutschke, K. Eckert	Numerical method to determine the inverse solution of two impacting rods of non-constant cross section J. Burgert, W. Seemann	Artificial intelligence control applied to drag reduction of the fluidic pinball G.Y. Cornejo Maceda, B.R. Noack, F. Lusseyran, M. Morzynski, N. Deng, L. Pastur
09:30	Numerical investigation of simultaneous multi-bubble collapse scenarios with varying initial size A. Lunkov, S. Adami, N.A. Adams	Frequency-bounded delay and sum: a modified damage detection method in thin walled plates A. Sattarifar, T. Nestorović	Control of chaotic systems by deep reinforcement learning M.A. Bucci, O. Semeraro, A. Allauzen, L. Cordier, L. Mathelin
09:50	Numerical investigations of the hydrodynamics and oxygen mass-transfer in aerated tanks A.K. Höffmann, P. Ehrhard	Sensor positioning in the context of wave-based damage identification in dams I. Reichert, M. Alalade, T. Lahmer	Control of transient instabilities by order reduction on optimally time-dependent modes A. Blanchard, T. Sapsis
10:10	On the influence of strain hardening on a rising bubble S. Descher, O. Wünsch	Simulation of vibrational sources and vibroacoustic transfer in wind turbine drivetrains F. Ihlenburg, T. Grätsch, M. Zarnekow	

S14.01 **Applied analysis** Chair: P. Dondl **HS 32**	S14.02 **Applied analysis** Chair: U. Stefanelli **SR 08**	S15.01 **Uncertainty quantification** Chair: H. Gottschalk **HS 07**	
Mathematical modeling of structure and function in interacting cell systems A. Stevens	A higher order geometrically nonlinear Cosserat-shell model with initial curvature effects P. Neff, M. Birsan, I. Ghiba	Uncertainty quantification with stochastic discontinuities A. Barth	**08:30**
			08:50
A bulk-surface reaction-diffusion system for cell polarization M. Röger, B. Niethammer, J.J.L. Velázquez	Idealized pure and simple shear J. Voss, C. Thiel, R.J. Martin, P. Neff	Random elliptic PDEs with levy coefficients O.G. Ernst, T. Kowalewitz, H. Gottschalk, M. Reese	**09:10**
A PDE model for bleb formation and interaction with linker proteins P. Werner, M. Burger	Tikhonov regularization including tolerances in parameter space G. Sfakianaki, I. Piotrowska-Kurczewski, P. Maass	The diffusion equation with random diffusion coefficient given by (transformed) Lévy fields H. Gottschalk, M. Reese, O.G. Ernst, T. Kowalewitz	**09:30**
Balanced viscosity solutions for infinite-dimensional multi-rate systems R. Rossi, A. Mielke	Variational problems involving Caccioppoli partitions S. Tornquist	Fast simulation of non-stationary Gaussian random fields: the sinc-multilevel approach L. Herrmann, K. Kirchner, C. Schwab	**09:50**
On Fokker-Planck equations with mass evolution I. Humpert, J. Pietschmann, M. Burger	Homogenization and dimension reduction of a textile shell in linear elasticity S. Wackerle, G. Griso, J. Orlik	Sparse compression of expected solution operators D. Peterseim, M. Feischl	**10:10**

Contributed Sessions

	S17.01 **Applied and numerical linear algebra** Chair: O. Rheinbach **Elise-Richter HS**	S18.01 **Numerical methods of differential equations** Chair: M. Ohlberger **HS 31**	S19.01 **Optimization of differential equations** Chair: R. Herzog **HS 30**
08:30	Model reduction techniques for port-Hamiltonian differential-algebraic systems S. Hauschild, N. Marheineke, V. Mehrmann	Localization and mass conservation in reduced basis methods F. Schindler, M. Ohlberger	An optimal design of an elastic plate in a dynamic contact with a rigid obstacle I. Bock, M. Kečkemétyová
08:50	Parametric model order reduction based on H2xL2 optimality conditions M. Hund, P. Mlinarić, J. Saak	A technique for rational model order reduction of parametric problems lacking uniform inf-sup stability D. Pradovera, F. Bonizzoni, F. Nobile, I. Perugia	Necessary optimality conditions of VI constrained shape optimization problems K. Welker, D. Luft, V. Schulz
09:10	On the application of a greedy reduced basis scheme to the multi-frequency solution of acoustic boundary element equations C. Jelich, S.K. Baydoun, S. Marburg	Model order reduction for space-adaptive simulations of unsteady incompressible flows C. Gräßle, M. Hinze, J. Lang, S. Ullmann	Efficient interface identification with an optimum experimental design M. Siebenborn
09:30	Linear algebra properties of dissipative Hamiltonian systems V. Mehrmann, C. Mehl, M. Wojtylak	Towards efficient band structure computations of photonic crystals using model order reduction M. Froidevaux	A discrete shape manifold and its use in PDE-constrained shape optimization R. Bergmann, R. Herzog, E. Loayza-Romero
09:50	Topological analysis of FMUs in liquid flow networks A. Baum, M. Kolmbauer, G. Offner	Multi-fidelity optimization using reduced order models K.A. Tolle, N. Marheineke	Multimaterial topology optimization based on the topological derivative P. Gangl
10:10	Kemeny's constant and Braess' paradox S. Kirkland	Generalized Galerkin approximation in time for wave equations M. Bause, M. Anselmann	Topology optimization of electrical machines with stress constraints J. Holley, M. Hintermüller

S20.01 Dynamics and control Chair: S. Lucia HS 05	S22.01 Scientific computing Chair: C. Himpe HS 42	S23.01 Applied operator theory Chair: O. Post SR 06	
H2-optimal model order reduction of interconnected systems P. Benner, S. Grundel, P. Mlinarić	Model order reduction for the masses R. Milk, P. Mlinarić, S. Rave, F. Schindler	Schrodinger operators exhibiting an abrupt change of the spectral character P. Exner	**08:30**
Model reduction of district heating using network decomposition M. Rein, J. Mohring, T. Damm, A. Klar			**08:50**
Filtering and model order reduction of PDAEs with stochastic boundary data N. Stahl, N. Marheineke	A-priori pole selection for reduced models in structural dynamics Q. Aumann, G. Müller	Finite element solutions to a Sturm-Liouville transmission eigenproblem C. Gheorghiu, B. Zinsou	**09:10**
Semi-active H_∞ damping optimization by adaptive interpolation Z. Tomljanović, M. Voigt	Parametric model order reduction using tensor principal orthogonal decomposition M. Pak, M. Cruz Varona, S. Hu, B. Lohmann	The non-real spectrum of singular indefinite Sturm-Liouville operators with uniformly locally integrable potentials J. Behrndt, P. Schmitz, C. Trunk	**09:30**
Fixed order H-infinity controller design for delay systems P. Schwerdtner, M. Voigt	Model hierarchy of upper-convected Maxwell models with regard to simulations of melt-blowing processes M. Wieland, W. Arne, N. Marheineke, R. Wegener	Dirac systems on the semi-axis: reflection coefficients and Weyl functions A. Sakhnovich	**09:50**
Polynomial approximation of Isaacs' equation and applications to control under uncertainty D. Kalise, S. Kundu, K. Kunisch	Efficient structural reliability analysis coupling an adaptive subset simulation and PGD model reduction A. Robens-Radermacher, J. Unger	Self-adjoint Dirac operators on domains in $\mathbb{R}^3$ M. Holzmann	**10:10**

	MS1 **Mathematical modeling, analysis and simulation of drug distribution for efficient pharmacotherapy** Chair: J. Duintjer Tebbens, E. Friedmann **HS 34**		MS2 **Topology optimization of structures considering elaborate constraints and variables** Chair: T. Vietor, A. Schumacher, S. Fiebig **BIG HS**
14:00	Predicting drug disposition and metabolism in breast tumours A. Barber, N. Plant	**14:00**	Compilation of activities to extend the standard topology optimization procedures for real mechanical problems T. Vietor, S. Fiebig, A. Schumacher
14:30	An introduction into current mathematical drug distribution models from the pharmacologic point of view P. Pavek, J.D. Tebbens	**14:20**	Topology optimization for real industrial design problems M. Zhou, R. Fleury, F. Fuerle, L. Zhao
15:00	On conservative and unconditionally positivity preserving numerical methods A. Meister, S. Kopecz	**14:40**	Application of topology optimization in automotive industry L. Harzheim
15:30	Mathematical modelling of intracellular protein dynamics: the importance of the spatial organisation of an eukaryotic cell Z. Szymanska, M. Parisot, M. Lachowicz, W. Wronowska	**15:00**	Form finding by shape optimization and vertex morphing K. Bletzinger
		15:20	Meta-modelling of the missing link between the analytical Topological Derivative equations and sensitivities for the optimization of crash loaded structures K. Weider, A. Schumacher
		15:40	Optimization of structure-borne sound propagation using structural intensity S. Rothe, S.C. Langer

MS3 Research software and -data: How to ensure replicability, reproducibility, and reusability Chair: J. Fehr, C. Himpe HS 50	MS4 Coupled problems in rotating machinery Chair: W. Seemann, A. Boyaci, D. Kern HS 21	MS5 Input-to-state stability of distributed parameter systems Chair: A. Mironchenko, F. Schwenninger HS 01	
Sustainable research software A. Zeller	A mixed variational-based dynamic simulation method for fiber-reinforced continua in non-isothermal rotordynamical systems M. Groß, J. Dietzsch, C. Röbiger	ISS and ISS-Lyapunov functions: an introductory overview L. Grüne	**14:00**
Sustainable development of research software J. Fehr, C. Himpe, S. Rave, J. Saak	Coupled effects of the rotor support at vibration based monitoring S. Krügel, J. Maierhofer, C. Wagner, T. Thümmel, D.J. Rixen	Input-to-state stability for nonlinearly boundary-controlled port-Hamiltonian systems J. Schmid, H. Zwart	**14:20**
Integrating publication, software and data in simulation sciences B. Flemisch, T. Koch, M. Schneider	First critical speed determination of a rotor via low-speed measurements H. Ecker, J. Kogler	Optimal stabilization of flows by value function approximations T. Breiten, K. Kunisch, L. Pfeiffer	**14:40**
FAIR principles for research software and data in the area of computer-based simulation S. Hermann	Non-linear vibrations in rotor systems with floating ring bearings induced by fluid structure interactions E. Woschke, S. Nitzschke, C. Daniel	Strong input-to-state stability for infinite-dimensional linear systems R. Nabiullin, F. Schwenninger	**15:00**
Devising a new fluid dynamics solver based on generic mathematical software libraries M. Kronbichler	Numerical analysis of fluid-film-cavitation on rotordynamic vibration and stability behavior H. Dong, G. Nowald, D. Lu, B. Schweizer	Stability and well-posedness for non-autonomous port-Hamiltonian systems B. Augner, H. Laasri	**15:20**
An automated performance evaluation framework for the Ginkgo software ecosystem H. Anzt	Some aspects of the impact of using foil bearings on rotor dynamics B. Bou-Said	ISS small gain theorems for spatially invariant systems F. Wirth	**15:40**

	DFG-PP 1748 Reliable simulation techniques in solid mechanics. Development of non-standard discretization methods, mechanical and mathematical analysis Chair: J. Schröder, T. Wick HS 32	DFG-PP 1798 Compressed sensing in information processing (CoSIP) Chair: G. Kutyniok, A. Behboodi HS 02	DFG-PP 1886 Polymorphic uncertainty modelling for the numerical design of structures Chair: M. Kaliske HS 42
14:00	A new C0-continuous finite element formulation for gradient elasticity J. Riesselmann, J. Ketteler, M. Schedensack, D. Balzani	Robust one-bit compressed sensing with non-Gaussian measurements S. Dirksen, S. Mendelson	Application of recurrent neural networks in structural analysis of concrete structures considering polymorphic uncertainty F. Leichsenring, A. Fuchs, W. Graf, M. Kaliske
14:20	A posteriori error control for the finite cell method A. Schröder, D. D'Angella, P. Di Stolfo, A. Düster, S. Hubrich, S. Kollmannsberger, E. Rank		Polymorphic uncertainty propagation with application to failure analysis of adhesive bonds in rotor blades M. Drieschner, M. Eigel, R. Gruhlke, D. Hömberg, Y. Petryna
14:40	A posteriori estimator for the adaptive solution of a quasi-static fracture phase field model M. Walloth, K. Mang, T. Wick, W. Wollner	Low rank recovery from phaseless inner products with matrix groups D. Gross, I. Roth, R. Kueng, S. Kimmel, Y. Liu, J. Eisert, M. Kliesch	Polymorphic uncertainty quantification in acoustic systems T. Kohlsche, S. Lippert, O. von Estorff
15:00	Adaptive isogeometric discretizations for diffuse modelling of discontinuities M. Kästner, P. Hennig, R. Maier, D. Peterseim	Learning the invisible T.A. Bubba, G. Kutyniok, M. Lassas, M. März, W. Samek, S. Siltanen, V. Srinivasan	Polymorphic Uncertainty Quantification via Hierarchical Low Rank Tensors L. Grasedyck, D. Moser
15:20	Quasi-collocation methods for isogemetric and stochastic finite-element-analysis H.G. Matthies, F. Fahrendorf, L. de Lorenzis, B. Rosic, S.K. Shivanand	Analysis of the generalization error: empirical risk minimization over deep artificial neural networks overcomes the curse of dimensionality in the numerical approximation of black-scholes partial differential equations J. Berner, P. Grohs, A. Jentzen	Some theoretical aspects of the spectral Fuzzy FEM D. Pivovarov, K. Willner, P. Steinmann
15:40	The alternating direction method of multipliers with variable step sizes and its application to the simulation of BV-damage evolution M. Milicevic, S. Bartels, M. Thomas	A gridless CS approach for channel estimation in hybrid massive MIMO systems K. Ardah, A.L.F. de Almeida, M. Haardt	Uncertainty Quantification in Fluid Mechanics and Fluid-Structure Interaction Using Cheap Approximators J. Nitzler, J. Biehler, P. Koutsourelakis, W.A. Wall

DFG-PP 1897.01 Calm, smooth and smart - novel approaches for influencing vibrations by means of deliberately introduced dissipation Chair: P. Eberhard HS 41	DFG-PP 1962.01 Non smooth and complementarity-based distributed parameter systems: simulation and hierarchical optimization Chair: M. Hintermüller HS 07	DFG-PP 2020.01 Cyclic deterioration of high-performance concrete in an experimental-virtual lab Chair: S. Löhnert HS 31	
A numerical model for analysis of design parameters for particle dampers N. Meyer, R. Seifried	Structural total variation regularization with applications in inverse problems M. Hintermüller	Investigation of failure mechanisms in high strength concrete using 3D-XFEM R. Patel, S. Löhnert	**14:00**
Investigating the effect of complex particle shapes in liquid filled particle dampers using coupled DEM-SPH methods P. Eberhard, C. Gnanasambandham		A unified multiscale modelling approach for concrete fatigue with microscale damage-mechanism implementations A. Caggiano, D. Said Schicchi, S. Harenberg, V. Malácris-Pfaff, M. Pahn, F. Dehn, E. Koenders	**14:20**
Model reduction of second-order systems with MORLAB P. Benner, I. Dorschky, T. Reis, M. Voigt, S. Werner	Monotone multilevel method and least-squares finite elements for linear elastic contact G. Rovi, B. Kober, G. Starke, R. Krause	Description and analysis of pullout behavior of hooked steel fibers embedded in high performance concrete using phase-field modeling M. Pise, D. Brands, G. Gebuhr, M. Sahril, J. Schröder, S. Anders	**14:40**
Global proper orthogonal decomposition for parametric nonlinear model order reduction C.H. Meyer, C. Lerch, D.J. Rixen	Directional differentiability for parabolic QVIs of obstacle type A. Alphonse, M. Hintermüller, C.N. Rautenberg	Water-induced failure mechanics for concrete: micro-mechanical model, experimental observation and phase-field coupling F. Aldakheel, P. Wriggers	**15:00**
Impact of model reduction on frequency responses of linear and geometric nonlinear finite element models C. Lerch, C.H. Meyer, B. Lohmann	Optimal control of static contact in finite strain elasticity A. Schiela, M. Stöcklein	Phase-field modeling and simulation of fatigue phenomena in brittle materials M. Ambati, P. Carrara, R. Alessi, L. De Lorenzis	**15:20**
Parameter variation on nonlinear energy sink attached to multiple degree of freedom system M. Jahn, L. Panning-von Scheidt, J. Wallaschek	Optimizing fracture propagation using a phase-field approach I. Neitzel, T. Wick, W. Wollner	On the analysis of crack-closure behaviour using the phase-field method together with the novel concept of Representative Crack Elements J. Storm, S. Dennie, M. Kaliske	**15:40**

	DFG-PP 1897.02 Calm, smooth and smart - novel approaches for influencing vibrations by means of deliberately introduced dissipation Chair: P. Eberhard HS 41	DFG-PP 1962.02 Non smooth and complementarity-based distributed parameter systems: simulation and hierarchical optimization Chair: M. Hintermüller HS 07	DFG-PP 2020.02 Cyclic deterioration of high-performance concrete in an experimental-virtual lab Chair: J. Storm HS 31
16:30	Parameter identification of brake pad shims for complex eigenvalue analysis D. Schmid, V. Sessner, N. Gräbner, U. von Wagner, K.A. Weidenmann	Unique global solutions in PDE and VI-constrained optimization A. Ahmad Ali, K. Deckelnick, M. Hinze	DEM calibration for modelling of the fatigue behavior of ultra-high-performance concrete S. Rybczynski, M. Dosta, F. Schmidt-Doehl
16:50	On the dynamics of a prestressed sliding wedge damper J. Aramendiz, A. Fidlin, E. Baranowski		Characterizing high performance concrete in the frequency domain: validation experiments J. Sauer, J. Musialak, H. Steeb
17:10	Application of a variational higher order mixed shell theory towards understanding the deformation behavior of hybrid laminates A. Jackstadt, W.V. Liebig, V. Sessner, K.A. Weidenmann, L. Kärger	Total variation of the normal as a prior in geometric inverse problems R. Herzog, R. Bergmann, M. Herrmann, S. Schmidt, J. Vidal-Nunez	Influence of load-induced temperature on fatigue behaviour of UHPC N.L. Tran, M. Deutscher, S. Scheerer
17:30	Identification of radiation damping from modal analysis of structural acoustic systems in unbounded domains S.K. Baydoun, S. Marburg	Solving inverse optimal control problems to global optimality S. Dempe, F. Harder, P. Mehlitz, G. Wachsmuth	
17:50	Overcoming directional damping limitation – investigation for two degree-of-freedom system A.S. Tan, T. Sattel	Structure of subgradients for the obstacle problem and numerical realization A. Rauls, S. Ulbrich	
18:10		Numerical approximation of rate-independent evolutions M. Sievers, C. Meyer	

S02.02 **Biomechanics** Chair: T. Ricken **HS 01**	S03.02 **Damage and fracture mechanics** Chair: T. Brepols **HS 50**	S04.03 **Structural mechanics** Chair: M. Bischoff **Audimax**	
Computational modeling of adhesive contact between a virus and a cell during receptor driven endocytosis T. Wiegold, S. Klinge, G.A. Holzapfel, R.P. Gilbert	A variational phase field model for ductile fatigue S. Teichtmeister, R. Alessi	A new approach to mixed methods for Reissner-Mindlin plates and shells W. Zulehner	**16:30**
Continuum-mechanical modelling of apoptosis P. Schroeder, A. Wagner, D. Stoehr, M. Rehm, W. Ehlers	Application of higher-order strain gradient theories in the phase-field modelling of fracture mechanics D. Juhre, R. Makvandi	Reissner-Mindlin shell theory based on tangential differential calculus D. Schöllhammer, T. Fries	**16:50**
Modeling the vesicle motion through the cytoplasm D.C. Haspinger, S. Klinge, G.A. Holzapfel	Efficient phase-field modelling of fatigue crack propagation M. Seiler, T. Linse, P. Hantschke, M. Kästner	The Hellan-Herrmann-Johnson method for nonlinear shells M. Neunteufel, J. Schöberl	**17:10**
Modelling cell motility as an active liquid crystal film with evolving free boundary G. Kitavtsev, A. Münch, B. Wagner	On phase field modeling in the context of cyclic mechanical fatigue C. Schreiber, C. Kuhn, R. Müller	A physically and geometrically nonlinear formulation for isogeometric analysis of solids in boundary representation M. Chasapi, S. Klinkel	**17:30**
On the comparison of mechanical properties of milk fouling and whey protein isolate fouling using of indentation tests J. Liu, H. Wiese, W. Augustin, S. Scholl, M. Böl	Simulation of fatigue damage in power semiconductors subjected to transient thermo-mechanical loading P. Hoffmann, M. Springer, M. Todt, B. Karunamurthy, M. Nelhiebel, H.E. Pettermann	Imperfection sensitivity of ring and stringer stiffened cylinders S. Kern, D. Dinkler	**17:50**
			18:10

Contributed Sessions

	S04.04 **Structural mechanics** Chair: G. Hofstetter	S05.02 **Nonlinear oscillations** Chair: L. Dostal	S06.02 **Material modelling in solid mechanics** Chair: J. Schröder
	SR 04	**SR 06**	**BIG HS**
16:30	Modeling of NATM tunneling using a rock damage plasticity model M. Schreter, M. Neuner, P. Gamnitzer, G. Hofstetter	Influence of friction on the locomotion of soft robots K. de Payrebrune	Gradient enhanced crystal plasticity in additive manufacturing: identification of a macroscopic yield criterion A. Kergaßner, J. Mergheim, P. Steinmann
16:50	Numerical modeling of shotcrete and application to simulations of deep tunnel advance M. Neuner, M. Schreter, P. Gamnitzer, G. Hofstetter	Vibrational influence on the friction forces during disk brake squeal T.M.T. Nguyen, N. Gräbner, U. von Wagner	A comparative study of integration algorithms for finite single crystal (visco-)plasticity S. Prüger, B. Kiefer
17:10	Multiphase simulations of concrete overlays interacting with an existing substrate A. Brugger, P. Gamnitzer, G. Hofstetter	Bifurcations and limit cycles due to self-excitation in nonlinear systems with joint friction: initialization of isolated solution branches via homotopy methods J. Kappauf, H. Hetzler	On the implementation of rate-independent gradient-enhanced crystal plasticity theory V. Fohrmeister, J. Mosler
17:30	Concrete hinges: experiments, simulations, and design considerations T. Schlappal, J. Kalliauer, S. Gmainer, M. Vill, J. Eberhardsteiner, H. Mang, B. Pichler	Modeling of the stick-slip motion of an oscillatory roller during soil compaction I. Paulmichl, C. Adam, D. Adam	Multi-level thermomechanical material modeling to study heterogeneous plastic deformation of DP600 steel and effects of residual stresses on its mechanical properties S. Ahmed, S. Löhnert, P. Wriggers
17:50		On a simple nonlinear system with circulatory forces A.A. Barakat, P. Hagedorn	Test-based development in material modeling L.F.D. Munk, D. Beurle, S. Reschka, S. Löhnert, P. Wriggers
18:10		Numerical simulation of vibro-impact problems using a massless boundary approach J. Gross, C. Monjaraz Tec, M. Krack	Small strain crystal plasticity based on the primal dual interior point method L. Scheunemann, P.S. Nigro, J. Schröder, P.M. Pimenta

S07.02 Coupled problems Chair: A. Meister HS 21	S09.02 Laminar flows and transition Chair: B. Eckhardt HS 03	S11.02 Interfacial flows Chair: D. Peschka HS 02	
A least-squares finite element approach to model fluid-structure interaction problems S. Averweg, A. Schwarz, C. Nisters, J. Schröder	Probing transition to turbulence and low-drag turbulent states in channel flow using wall shear stress signals R. Agrawal, H. Ng, D. Dennis, R.J. Poole	Interfacial flows described by reduced models M. Bestehorn	**16:30**
Thermo-mechanical fluid-structure interaction of thermal buckling K. Martin, S. Reese			**16:50**
Numerical and experimental research on effect of constraint methods on welding residual stress and nanomechanical performance of aluminum AA5083 T. Li, L. Zhang, W. Dou, X. Wang	Power-law scaling of friction in pipe flow D. Scarselli, J. Lopez, B. Suri, B. Hof	Horizontal Faraday instability and parametric excitation in a circular channel I. Borcia, R. Borcia, M. Bestehorn, S. Richter, W. Xu, U. Harlander	**17:10**
Discontinuous Galerkin method for incompressible two-phase flows J.T. Gerstenbegrer, M. Nolte, S. Burbulla, D. Kröner	Universality of the transition to turbulence in Couette flow L. Klotz, G. Lemoult, B. Hof	Observations of wave patterns affected by sub-surface shear currents S.Å. Ellingsen, B.K. Smeltzer, E. Aesoey	**17:30**
Using FEniCS and OpenFOAM for the simulation of conjugate heat transfer in a partitioned fashion B. Rüth, P. Meisrimel, P. Birken, G. Chourdakis, B. Uekermann	Percolation as a high-precision measurement tool for the laminar-turbulent boundary layer transition on an airfoil B. Espenhahn, D. Traphan, T.T. Wester, G. Gülker, J. Peinke	Thin liquid film formation on hemispherical and conical substrate M. Scholle, F. Marner, P.H. Gaskell, A.E. Morris	**17:50**
A Navier-Stokes-Korteweg model for dynamic wetting based on the PeTS equation of state F. Diewald, M. Heier, M. Lautenschläger, M. Horsch, C. Kuhn, K. Langenbach, H. Hasse, R. Müller	Three-dimensional flow in a shear-driven cube P. des Boscs, H.C. Kuhlmann		**18:10**

Contributed Sessions

	S12.02 **Waves and acoustics** Chair: B. Kaltenbacher **HS 34**	S13.02 **Flow control** Chair: W. Schröder **SR 07**	S14.03 **Applied analysis** Chair: P. Dondl **HS 32**
16:30	Adaptive discontinuous Galerkin methods for the Helmholtz equation S. Congreve, J. Gedicke, I. Perugia	External acoustic control of the laminar boundary layer separation over a circular cylinder M. Lemke, V. Citro, J. Sesterhenn, F. Giannetti	On the long time behavior of a tumor growth model E. Rocca
16:50			
17:10	Covariant and contravariant complex stretching for time dependent wave propagation problem solved with discontinuous finite elements B. Kapidani, J. Schöberl	Aerodynamic drag reduction using trapped vorticity flow control M. DeSalvo, A. Glezer	Analysis of a Cahn-Hilliard-Brinkman model for tumour growth with chemotaxis M. Ebenbeck, H. Garcke
17:30	An explicit Mapped Tent Pitching scheme for wave equations J. Gopalakrishnan, J. Schöberl, C. Wintersteiger	Perimetric blowing at the rear of a bluff body: consequences on the wake dynamics and drag reduction M. Lorite-Díez, J.I. Jiménez-González, L. Pastur, O. Cadot, C. Martínez Bazán	Patterns and waves in nonlocal reaction-diffusion equations C. Kuehn
17:50	New mass-lumped tetrahedral elements for 3D wave propagation modelling S. Geevers, W. Mulder, J. van der Vegt	Harnessing the Kelvin-Helmholtz instability: feedback stabilization of an inviscid vortex sheet B. Protas, T. Sakajo	Volume-surface reaction-diffusion systems arising from cell biology: analysis and numerics B.Q. Tang
18:10	L-sweeps: a scalable parallel high-frequency Helmholtz solver M. Taus, L. Zepeda Núñez, R.J. Hewett, L. Demanet		On a Lotka-Volterra reaction-diffusion-ODE system with the superimposed interaction between two Neolithic populations J. Elias, D. Hilhorst, M. Mimura, Y. Morita, M.H. Kabir

S14.04 **Applied analysis** Chair: U. Stefanelli **SR 08**	S15.02 **Uncertainty quantification** Chair: H. Gottschalk **HS 16**	S17.02 **Applied and numerical linear algebra** Chair: O. Rheinbach **Elise-Richter HS**	
ϵ-expansion of constrained hyperbolic PDEs C. Zimmer, R. Altmann	Adaptive sparse polynomial chaos expansions: a survey N. Lüthen, B. Sudret	Computational homogenization in EXASTEEL A. Klawonn, S. Köhler, M. Lanser, O. Rheinbach	**16:30**
Asymptotic analysis of the visco-acoustic equations for absorbing walls of arrays of Helmholtz resonators A.X. Semin, K. Schmidt	An intrusive PCE extension of the Contour Integral Method and its application in electrical engineering E. Frick, D. Dahl, C. Seifert, M. Lindner, C. Schuster	EXASTEEL: developments in nonlinear and linear domain decomposition methods M. Lanser, A. Klawonn, O. Rheinbach	**16:50**
Dimension reduction and homogenization of a linear elastic periodic shell M. Hauck, J. Orlik	Formulation of a spectral stochastic finite element for problems with uncertain geometry D. Trauner, C. Bucher	FROSch - a parallel implementation of the GDSW domain decomposition preconditioner in Trilinos A. Heinlein, A. Klawonn, O. Rheinbach	**17:10**
Thermodynamically consistent modelling and analysis of bulk-surface systems with sorption and surface chemistry B. Augner, D. Bothe	Model order reduction for linear stochastic Galerkin systems with moments as outputs R. Pulch, A. Narayan	A three-level GDSW overlapping Schwarz preconditioner A. Heinlein, A. Klawonn, O. Rheinbach, F. Röver	**17:30**
The quasiconvex envelope of conformally invariant planar energy functions R.J. Martin, J. Voss, O. Sander, I. Ghiba, P. Neff	A higher order perturbation approach for electromagnetic scattering problems on random domains J. Dölz	A time adaptive multirate Dirichlet-Neumann waveform relaxation method for heterogeneous coupled heat equations A. Monge, P. Birken	**17:50**
The fractional p-Laplacian emerging from discrete homogenization of the random conductance model with degenerate ergodic weights M. Heida, F. Flegel	Padé-based model order reduction for parametric/stochastic Helmholtz frequency response problems F. Bonizzoni, F. Nobile, I. Perugia, D. Pradovera	Asynchronous time integration in structural mechanics A.S. Seibold, D.J. Rixen	**18:10**

Contributed Sessions

	S18.02 **Numerical methods of differential equations** Chair: M. Ohlberger **HS 06**	S19.02 **Optimization of differential equations** Chair: K. Welker **HS 30**	S20.02 **Dynamics and control** Chair: R. Geiselhart **HS 05**
16:30	Tensor methods for the time-dependent Vlasov-Poisson system V. Ehrlacher, D. Lombardi	Shape optimization for interface identification with nonlocal system models C. Vollmann, V. Schulz	CANFIS based semi-active vibration control of stochastically excited high-rise civil engineering structures with nonlinearities and uncertainties O. Altay, S. Klinkel
16:50		Numerical methods for optimal design in conductivity M. Vrdoljak, P. Kunštek	Control of structural displacements by eigenstrains in the presence of propagating singular waves: uni-axial motion H. Irschik, A. Brandl
17:10	A domain decomposition method for the Poisson-Boltzmann solvation model C. Quan, B. Stamm, Y. Maday	Shape optimization in phosphate production N. Dietrich	External vibration damping of a robot manipulator's TCP using acceleration feedback T.F.C. Berninger, D.J. Rixen
17:30	Efficient numerical methods for nonlinear DAEs arising from gas transportation networks N. Banagaaya, S. Grundel, P. Benner	Shape optimization for high temperature processes T. Marx	Mixed control of vibrational systems I. Nakić, N. Truhar, Z. Tomljanović
17:50	Parallel tensor arithmetic in the Hierarchical Tucker format C. Löbbert, L. Grasedyck		Model-free adaptive control method applied to vibration reduction of a flexible crane as MIMO system H.A. Pham, D. Söffker
18:10	A SDE waveform-relaxation method with application in distributed neural network simulations J. Hahne, M. Bolten		

S22.02 **Scientific computing** Chair: H. Anzt **HS 42**	S23.02 **Applied operator theory** Chair: J. Rohleder **SR 03**	S24.01 **History of mechanics and history, teaching and popularization of mathematics** Chair: O.T. Bruhns **SR 05**	
IMEX-ODTLES: A multi-scale and stochastic approach for highly turbulent flows J. Medina, C. Glawe, T. Starick, M.S. Schöps, H. Schmidt	Everything is possible for the domain intersection of an operator and its adjoint C. Tretter, Y. Arlinskiii	Science thriller: The dramatic destiny of Alexander Mohrenstein-Ertel and the history of elastohydrodynamics E. Popova, V.L. Popov	**16:30**
Shape optimization with a one-way coupled Eulerian model for laminar particulate flow problems R. Hohmann, C. Leithäuser, A. Meister	Essential spectrum of operator pencils H. Gernandt		**16:50**
Pressure Poisson equation for the stokes system D.R.Q. Pacheco, O. Steinbach	Friedrichs operators as dual pairs N. Antonić, M. Erceg, A. Michelangeli	August Wöhler - founder of fatigue strength H. Zenner, K. Hinkelmann	**17:10**
Algorithmic differentiation of an industrial airfoil design tool coupled with the adjoint CFD method M. Banovic, I. Vasilopoulos, A. Walther, M. Meyer	On the Cafarelli-Silvestre extension approach to fractional powers in Banach spaces J. Meichsner, C. Seifert	Palmgren, Gaßner and the challenges of fatigue at variable amplitudes M. Wächter, K. Hinkelmann, A. Esderts, H. Zenner	**17:30**
Accurate gradient computations for shape optimization via discrete adjoints in CFD-related multiphysics problems O. Burghardt, N.R. Gauger	The essential numerical range for unbounded linear operators S. Bögli, M. Marletta, C. Tretter	A brief historical tour of glacier ice on earth and its role in climate dynamics K. Hutter, D. Gross	**17:50**
	The Crouzeix conjecture and deformations of the numerical range. P. Pagacz, P. Pietrzycki, M. Wojtylak		**18:10**

Wednesday, February 20

08:30	**Contributed Sessions**	
	all lecture rooms	20 parallel sessions
09:30	**Coffee Break and Poster Session**	
	Festsaal, Hof 8, Student Space	Refreshment including coffee, tea, soft drinks, fruits, and biscuits
10:30	**Richard von Mises Prize Lecture**	
	Audimax	*To be announced* Chaired by Heike Faßbender
11:45	**GAMM General Assembly**	
	BIG HS	For GAMM members only
13:00	**Lunch**	
		Information on lunch options is available on page 20
	YAMM – Young Academics in Applied Mathematics and Mechanics	
	Kleiner Festsaal	YAMM: Career Opportunities for Young Academics *separate registration required, booked out*
14:00	**Contributed Sessions**	
	all lecture rooms	24 parallel sessions
16:00	**Coffee Break**	
	Festsaal, Hof 8, Student Space	Refreshment including coffee, tea, soft drinks, fruits, and biscuits
16:30	**Contributed Sessions**	
	all lecture rooms	25 parallel sessions
19:30	**Conference Dinner**	
	Rathaus (City Hall)	Information and guidance on how to reach Rathaus (City Hall) available on page 19

Contributed Sessions

	S02.03 **Biomechanics** Chair: M. Böl **HS 01**	S03.03 **Damage and fracture mechanics** Chair: R. Müller **HS 50**	S04.05 **Structural mechanics** Chair: I. Münch **Audimax**
08:30	Numerical simulation of viscoelastic effects during bubble-collapse driven tissue-penetration N. Hosseini, S. Adami, N.A. Adams	Discretization approaches to model cutting mechanisms in single grit scratch processes with lagrangian, ALE and SPH formulations P. Sridhar, K. de Payrebrune	Combining of the machine learning algorithm with the optimal transportation meshfree (OTM) method for metal cutting simulation D. Huang, C. Weißenfels, P. Wriggers
08:50	A study on nanoparticle transport in a micro blood vessel M. Bavandi, O. Wünsch	Aspects of the particle finite element method applied to contact problems M. Schewe, A. Menzel	Artificial neural networks in structural dynamics M. Stoffel, F. Bamer, B. Markert
09:10	Validation study of computational fluid dynamics models of hemodynamics in the human aorta J. Fuchsberger, E. Karabelas, P. Aigner, H. Schima, G. Haase, G. Plank	Numerical realization and fracture behavior of defect-free two-domensional silica glass J. Stratmann, F. Ebrahem, F. Bamer, B. Markert	Pseudo-kinematic invariants – gems in FE structural analyses H. Mang

S05.03 **Nonlinear oscillations** Chair: L. Dostal **HS 16**	S06.03 **Material modelling in solid mechanics** Chair: C. Schuecker **BIG HS**	S07.03 **Coupled problems** Chair: A. Wagner **HS 21**	
Invariant manifolds in control problems A. Steindl	An invariant-based formulation for transversely isotropic microsphere models with application to biomechanics C. Bleiler, O. Röhrle	An energetically consistent heat input model for additive manufacturing C. Burkhardt, D. Soldner, P. Steinmann, J. Mergheim	**08:30**
	Material model of pulp fibres T. Seidlhofer, U. Hirn, M. Ulz	Simulation of multiphysical coupled Additive Manufacturing processes P. Hartmann, C. Weißenfels, P. Wriggers	**08:50**
Nonlinear stability analysis of an oversteer automobile J. Edelmann, A. Steindl, M. Plöchl, G. Mastinu	Thermo-mechanical modeling of pre-consolidated fiber-reinforced plastics for the simulation of thermoforming processes J. Ziegs, D. Weck, M. Gude, M. Kästner	Influence of electrodeposition parameters on the coating process on open porous media C. Grill, A. Jung, S. Diebels	**09:10**

Contributed Sessions

	S07.04 **Coupled problems** Chair: M. Keip	S08.02 **Multiscales and homogenization** Chair: L. Scheunemann	S11.03 **Interfacial flows** Chair: T. Gambaryan-Roisman
	SR 07	**HS 41**	**HS 02**
08:30	Chemo-mechanical modeling of cathode particles of lithium-ion batteries A. Nateghi, M. Keip	Molecular dynamics simulation of ultrasonic metal welding of aluminum alloys S. Mostafavi, B. Markert	Gradient structures for flows of concentrated suspensions - jamming and free boundaries D. Peschka, M. Thomas, B. Wagner, A. Münch
08:50	The interaction of bulk stresses, surface stresses, and diffusion in nanostructured electrodes for lithium-ion batteries P. Stein, B. Xu	Virtual testing of additively manufactured grid structures U. Gebhardt, R. Gärtner, S. Holtzhausen, M. Kästner	Particle accumulation in high-Prandtl-number liquid bridges I. Barmak, F. Romanò, H.C. Kuhlmann
09:10	Structural optimization of electrically charged anodes S. Homberger, K. Weinberg, M. Werner	Laser shock peening: modelling across scales B. Klusemann, S. Keller, V. Pozdnyakov, J. Oberrath, N. Kashaev	

S12.03 **Waves and acoustics** Chair: B. Kaltenbacher	S14.05 **Applied analysis** Chair: P. Dondl	S15.03 **Uncertainty quantification** Chair: H. Gottschalk	
HS 34	**HS 32**	**HS 07**	
Towards space-time boundary element methods for retarded potential integral equations D. Pölz, M. Schanz	$C^{1/5-\epsilon}$ weak solutions to the two dimensional Monge-Ampére equation W. Cao, L. Szekelyhidi Jr.	Sensitivity analysis for electrical detection of aortic dissection G.M. Melito, V. Badeli, A. Reinbacher-Köstinger, K. Ellermann	**08:30**
Generalization of adaptive cross approximation for time-domain boundary element methods A.M. Haider, M. Schanz	A degenerate Cahn-Hilliard model as constrained Wasserstein gradient flow C. Cances, D. Matthes, F. Nabet	On the calculation of a dry friction coefficient L.J. Oestringer, C. Proppe	**08:50**
BEM-simulation of tubes using thin elements W. Kreuzer, V. Weber	Sharp interface limit of a Stokes/Cahn-Hilliard system H. Abels, A. Marquardt	Uncertainty quantification for optimal power flow problems T. Mühlpfordt, V. Hagenmeyer, T. Faulwasser	**09:10**

Contributed Sessions

	S16.01 **Experiment design** Chair: C. Kirches **HS 06**	S17.03 **Applied and numerical linear algebra** Chair: O. Rheinbach **Elise-Richter HS**	S18.03 **Numerical methods of differential equations** Chair: I. Perugia **HS 31**
08:30	First-order methods for regularized optimal experimental design problems R. Herzog, E. Legler	An algebraic multigrid method for linear elasiticity J. Schöberl, L.G. Kogler	A study of scaled boundary parametrizations in isogeometric analysis C. Arioli, B. Simeon
08:50	Sensitivity analysis of elastoplastic structures and application to optimal specimen design J. Liedmann, F. Barthold	Local Fourier analysis of multigrid smoothers for the Stokes problem L. Claus, M. Bolten	Optimal enforcement of Dirichlet conditions on curvilinear boundaries for Lagrange and Hermite finite element methods with straight-edged simplexes V. Ruas
09:10	Oblique projections and optimal actuator placement K. Sturm, S.S. Rodrigues	Parallel block-selective algebraic multigrid in foam-extend T. Uroic, H. Jasak	Unstructured T-splines based on local higher-dimensional mesh representations P. Morgenstern, R. Maier

S19.03 Optimization of differential equations Chair: M. Bause HS 30	S20.03 Dynamics and control Chair: R. Geiselhart HS 05	S22.03 Scientific computing Chair: H. Anzt HS 42	
Approximation of the Riccati operator for closed loop parabolic control problems H. Harbrecht, I. Kalmykov	Funnel control for linear non-minimum phase systems T. Berger	Dynamic selection limiter schemes for high density gradient simulations of supersonic rarefied gas flows R. Groll	**08:30**
A hybrid finite-dimensional RHC for stabilization of nonautonomous parabolic equations B. Azmi, K. Kunisch	Funnel control for boundary observation and control systems M. Puche	Modeling and simulation of the aqueous humor flow in the anterior chamber V. Olkhovskiy, E. Friedmann	**08:50**
On oblique projection based stabilizing feedback control for nonautonomous systems S.S. Rodrigues	Asymptotic tracking with funnel control S. Trenn	An accelerated boundary-domain integral method for three-dimensional fluid flow analysis J. Tibaut, J. Ravnik	**09:10**

	S23.03 **Applied operator theory** Chair: J. Rohleder **SR 06**	S24.02 **History of mechanics and history, teaching and popularization of mathematics** Chair: D. Gross **SR 05**
08:30	Differential-algebraic operators and the Kronecker form T. Reis, F. Schwenninger, M. Puche	Reconstruction of the genesis of a renaissance algorithm to calculate sine tables P. Ullrich
08:50		Using computer simulations in lectures in mathematics and in the natural sciences: learning-theoretical justifications R. Gunesch
09:10	Around maximal regularity with respect to L^∞ F. Schwenninger, B. Jacob, J. Wintermayr	

Contributed Sessions

	S01.01 **Multi-body dynamics** Chair: M. Krommer	S02.04 **Biomechanics** Chair: A.E. Ehret	S03.04 **Damage and fracture mechanics** Chair: T. Seelig
	SR 06	**HS 01**	**HS 50**
14:00	Multibody modelling and experimental identification of wind turbines C. Woernle, R. Rachholz, A. Schulze, J. Luthe, J. Zierath	Experimental micro- and nanomechanics of collagen rich-tissues and individual collagen fibrils P.J. Thurner, O.G. Andriotis, S. Desissaire, M.G. Jones, D.E. Davies	A gradient-plasticity approach to model the interaction between dislocation pile-up and cleavage initiation during fracture G. Hütter, N. Giang, M. Kuna
14:20			A gradient-extended damage-plasticity model for large deformations with nonlinear isotropic and kinematic hardening T. Brepols, S. Wulfinghoff, S. Reese
14:40	Double magnus type wind turbine L. Klimina, E. Shalimova, M. Dosaev, Y. Selyutskiy	Continuous versus discrete modeling of fiber dispersion in fibrous soft tissues G.A. Holzapfel, K. Li, R.W. Ogden, S. Sherifova, G. Sommer	Numerical investigation of wear processes by a gradient-enhanced damage-plasticity model G. Hoormazdi, K. Hackl, P. Junker
15:00	On grasp based objectives in human grasping simulation U.D. Phutane, M. Roller, S. Leyendecker	A microstructural model of crosslink interaction between collagen fibrils in the human cornea M. Vasta, A. Gizzi, A. Pandolfi	Extended finite element method and gradient-enhanced damage model for a 3D dynamic crack problem under cyclical loading T. Lyu, S. Löhnert, P. Wriggers
15:20	The Influence of foot geometry on the energy efficiency of models for bipedal walking U.J. Römer, A. Fidlin, W. Seemann	Key factors for soft tissue tensional homeostasis identified by discrete fiber network modeling and biaxial experiments J.F. Eichinger, D. Paukner, R.C. Aydin, J.D. Humphrey, C.J. Cyron	On the energetics of dynamic cohesive crack formation T. Laschütza, T. Seelig
15:40	Biomechanical simulations with dynamic muscle paths on NURBS surfaces J. Penner, S. Leyendecker	DNA beams: molecular-to-beam upscaling - theoretical foundations and application to DNA J. Kalliauer, S. Scheiner, G. Kahl, C. Hellmich	

S04.06 Structural mechanics Chair: W. Zulehner Audimax	S04.07 Structural mechanics Chair: P. Betsch SR 04	S05.04 Nonlinear oscillations Chair: K. Ellermann HS 16	
Two novel Kirchhoff plate finite elements for the Modified Strain Gradient Theory M. Kandaz, H. Dal	Lattice Boltzmann simulation of the dynamic behavior of solids A. Schlüter, T. Reinirkens, C. Kuhn, R. Müller	Studies of lubricant flow and friction in partially filled gaps L. Stahl, M. Müller, G. Ostermeyer	**14:00**
A rotation-free formulation of Mindlin's plate model M. Bischoff, B. Oesterle	Inverse dynamics of underactuated flexible mechanical systems T. Ströhle, P. Betsch	Comparison of dry friction models for the computational analysis of refrigerant-lubricated GFB rotor systems T. Leister, W. Seemann, B. Bou-Said	**14:20**
Rigorous amendment of Vlasov's theory for thin elastic plates on elastic Winkler foundations, based on the Principle of Virtual Power R. Höller, M. Aminbaghai, L. Eberhardsteiner, J. Eberhardsteiner, R. Blab, B. Pichler, C. Hellmich	Comparison of different excitation strategies in Operational Modal Analysis (OMA) M. Gille, T.F.C. Berninger, D.J. Rixen	Numerical analysis of vibration patterns in hydropower units C. Sperber, W. Weber, P. Eberhard	**14:40**
An a-priori error estimate for the consistent approximation approach P. Schneider, R. Kienzler	Design optimization of joint parameters using the frequency based substructuring approach A. El Mahmoudi, D.J. Rixen	Investigation of a centrifugal exciter with two coaxial unbalances on a carrier performing planar motion T. Yüzbasioglu, O. Drozdetskaya, A. Fidlin	**15:00**
Linear elastic plates under in-plane action: unified analytical solution procedure based on displacement unknowns W. Guggenberger	The sudden release of a rod constrained by a sliding sleeve F. Dal Corso, C. Armanini, D. Misseroni, D. Bigoni	Oscillations in a system of two coupled self-regulating pressure control valves with switching behaviour S. Schröders, A. Fidlin	**15:20**
A closed-form analytical approach for stress concentrations at elliptical holes in moderately thick plates J. Felger, W. Becker	On nullity of homogeneous linearized kinematic and equilibrium equations of the system of supported and connected rigid bodies R. Flajs	A geometrical nonlinear model for rotating cylindrical shells R. Schmidt, A. Ams	**15:40**

	S06.04 Material modelling in solid mechanics Chair: C. Schuecker BIG HS	S06.05 Material modelling in solid mechanics Chair: H.J. Böhm SR 05	S07.05 Coupled problems Chair: K. Weinberg HS 21
14:00	Numerical prediction of the homogenized orthotropic linear viscoelastic material properties of composite plies and laminated composites R. Tomas, M. Todt, T. Koch, H.E. Pettermann	An analytical study on the role of misfit dislocations in fracture toughness enhancement of superlattice coatings A. Wagner, D. Holec, M. Todt, P.H. Mayrhofer, M. Bartosik	Phase-field modeling of electro-mechanically induced fracturing of anisotropic electroceramics M. Keip, A. Sridhar
14:20	A constitutive model for fiber reinforced polymer plies - transition from hardening to softening behavior during anisotropic damage evolution J. Kaul, H.E. Pettermann	A framework and finite element formulation for incompatibility tensor-based gradient plasticity T. Kaiser, A. Menzel	
14:40	An anisotropic creep model for continuously and discontinuously fiber reinforced materials S. Fliegener, J. Hohe	Thermodynamic dislocation theory: torsion of bars Y. Piao, K.C. Le	Coupled physics solvers for analysing the magneto-thermal behaviour of a permanent magnet synchronous machines A. Lotfi, D. Marcsa, Z. Horváth, C. Prudhomme, V. Chabannes
15:00	FEM-simulation of the mechanical behavior of woven fabric composites using an anisotropic hyperelastic material model M. Gille, N.H. Kröger, D. Juhre	Thermodynamic dislocation theory of adiabatic shear banding in steel T.M. Tran, K.C. Le, J. Langer	Electromechanical coupling in neuron theory W.F. Ellermeier
15:20	Parameter identification for constitutive models of innovative textile composite materials using digital image correlation J.F. Hofmann, C. von Boyneburgk, S. Tunger, H. Heim, D. Kuhl	Thermodynamic dislocation theory K.C. Le	Coupling nonlinear magneto-thermal problems in frequency domain with the mechanical field K. Roppert, F. Toth, M. Kaltenbacher
15:40	Characterization of fiber matrix interface of continuous-discontinuous fiber reinforced polymers on the microscale B. Rohrmüller, M. Schober, K. Dittmann, P. Gumbsch, J. Hohe	Leaving the slip system - cross slip in continuum dislocation dynamics B. Weger	Novel mixed finite elements for piezoelectric hysteresis modeling M. Meindlhumer, A.S. Pechstein, A. Humer

S08.03 Multiscales and homogenization Chair: D.M. Kochmann	S09.03 Laminar flows and transition Chair: T.M. Schneider	S11.04 Interfacial flows Chair: R. Borcia	
HS 41	**HS 03**	**HS 02**	
Modern non-linear solution techniques in FFT-based computational micromechanics M. Schneider	Transport of electrically charged particles in transonic and supersonic gas flows L. Bernier, P. Krah, J. Reiss	Controlling sliding droplets with optimal contact angle distributions and a phase field model H. Bonart, C. Kahle, J. Repke	**14:00**
	Transformation of tribological modelling of squeeze flows to simulate the flow of highly viscous adhesives and sealants in manufacturing processes M. Müller, Y. Tong, T. Vallée, H. Fricke	Phase-field modeling of fluid-structure interaction S. Aland	**14:20**
A model order reduction method for finite strain FFT solvers using a compressed sensing technique C. Gierden, J. Kochmann, K. Manjunath, B. Svendsen, S. Reese	Simulation of the flow behavior of wood-polymer composites in extrusion dies F. Liese, O. Wünsch	Numerical treatment of interfaces D. Kroener	**14:40**
An explicit solution of implicit single crystal small-strain viscoplasticity and its use in FFT-based micromechanics D. Wicht, M. Schneider, T. Böhlke	Purely viscoelastic linear instability in plane Couette flow G.M. Lellep, B. Eckhardt, A. Morozov	An arbitrary Lagrangian-Eulerian formulation for fluid flow on evolving surfaces R.A. Sauer, A. Sahu, Y.A.D. Omar, K.K. Mandadapu	**15:00**
Informed training with increasing fidelity: modeling dynamic recrystallization from Taylor to FFT-based Field Monte Carlo Potts A.D. Tutcuoglu, D.M. Kochmann	A phase transition to condensate formation in two-dimensional turbulence M. Linkmann, M. Hohmann, G. Boffetta, M.C. Marchetti, B. Eckhardt	The role of degenerate mobilities in Cahn-Hilliard models M. Dziwnik	**15:20**
Preconditioning of the spectral Fourier method for homogenization of periodic media M. Ladecký, I. Pultarová, J. Zeman		Two-phase flow simulations for mold filling on 4D simplex space-time meshes V. Karyofylli, M. von Danwitz, L. Pauli, M. Behr	**15:40**

	S12.04 Waves and acoustics Chair: M. Kaltenbacher HS 34	S13.03 Flow control Chair: B. Noack SR 07	S14.06 Applied analysis Chair: U. Stefanelli HS 32
14:00	Cabin noise prediction using wave-resolving aircraft models S.C. Langer, C. Blech	Parameter study of turbulent drag reduction by spanwise traveling tansversal surface waves M. Albers, P.S. Meysonnat, D. Fernex, R. Semaan, B.R. Noack, W. Schröder	Rate-independent processes with time-discontinuous data D. Knees, C. Zanini
14:20		Cluster-based network model for drag reduction mechanisms of an actuated turbulent boundary layer D. Fernex, R. Semaan, M. Albers, P.S. Meysonnat, W. Schröder, R. Ishar, E. Kaiser, B.R. Noack	Convergence of the Allen-Cahn equation to mean curvature flow with 90°-contact angle H. Abels, M. Moser
14:40	High-order shape functions for interior acoustics F. Duvigneau, S. Duczek	Drag reduction of transversal surface waves for swept flat plates P.S. Meysonnat, M. Albers, W. Schröder	Effective diffusion in thin structures via generalized gradient systems and EDP-convergence T. Frenzel, M. Liero
15:00	Infinite elements for exterior Helmholtz resonance problems based on a frequency dependent complex scaling L. Nannen, M. Wess	Turbulent dissipation in drag reduced flows B. Frohnapfel, A. Cimarelli, Y. Hasegawa, M. Quadrio, D. Gatti	Rate-independent evolution of sets & application to fracture processes M. Thomas, U. Stefanelli, R. Rossi
15:20	Absorbing boundary conditions for nonlinear acoustics: the Westervelt equation B. Kaltenbacher, I. Shevchenko	Turbulent drag reduction by compliant surface tension active wall layer A. Roccon, F. Zonta, A. Soldati	Non-uniqueness for the transport equation with Sobolev vector fields S. Modena
15:40	Extension of the method of generalized ray to sound propagation in a wedge-shaped layer of fluid over a slow-speed elastic bottom P. Borejko	Flexible fibers in turbulent channel flow D. Dotto, C. Marchioli	Evolution of vector fields on flexible curves and surfaces G. Dolzmann, C. Brand

S14.07 **Applied analysis** Chair: P. Dondl	S15.04 **Uncertainty quantification** Chair: H. Gottschalk	S16.02 **Shape & material optimization I** Chair: C. Kirches	
SR 08	**HS 07**	**HS 06**	
Wellposedness of a piezoelectric partial differential equation system - analysis and application V. Schulze, B. Jurgelucks	Scale switching computations for heterogeneous inelastic materials T. Moshagen, S. Sarfaraz, B. Rosic, A. Ibrahimbegovic, H.G. Matthies	Free material optimization of multilayer composite materials S. Loske, F. Barthold	**14:00**
Some regularity results for a non-isothermal Cahn-Hilliard model A. Zafferi	Performing Monte-Carlo-based Dynamic Event Trees (MCDET) for probabilistic analysis of complex dynamic systems N. Berner, M. Kloos, J. Scheuer, J. Peschke	Automatic shape optimization of a 180-degree elbow for pressure loss minimization E. Bagheri, A. Lodermeyer, A. Logdesser, S. Becker	**14:20**
Incorrect estimates by the four wave interaction (FWI) system for the Fermi-Pasta-Ulam (FPU) system D.A. Sunny, S. Farooq	Optimal bounds for the probability of failure of sheet metal forming processes of DP steel N. Miska, D. Balzani	Controlling physical properties on interfaces using parametrised level set methods and extended finite element method F. Wohlgemuth, F. Barthold	**14:40**
Controlled oscillations as a sufficient condition for pre-compactness in the space of R-valued Young measures A. Raguz	Numerical methods for density driven groundwater flow with uncertain data A. Litvinenko, D. Logashenko, R. Tempone, G. Wittum, D. Keyes	Calibration of model coefficients of an extended eddy viscousity turbulence model for vortical flows N. Friedman, E. Zander, G. Subbian	**15:00**
A Naghdi type shell model for irregular shells M. Ljulj, J. Tambaca, Z. Tutek	Uncertainty propagation in a reinforced concrete model with localised failure S. Dobrilla, N. Friedman, H.G. Matthies, A. Ibrahimbegovic	Comprehensive optimization of frame structures A. Keller, I. Muench, W. Wagner	**15:20**
Homogenization of the diffusion equation on plane mesh structures M. Ljulj, K. Schmidt, A.X. Semin, J. Tambaca	Surrogate modelling for the global sensitivity analysis of problems with rapid local variations J.M. Lorenzi, S. Döpking, S. Matera	Load optimisation for air bending in the context of damage reduction F. Guhr, F. Barthold, R. Meya, A.E. Tekkaya	**15:40**

	S17.04 Applied and numerical linear algebra Chair: A. Heinlein	S18.04 Numerical methods of differential equations Chair: I. Perugia	S19.04 Optimization of differential equations Chair: A. Walther
	Elise-Richter HS	**HS 31**	**HS 30**
14:00	Constructing algebraic preconditioners from domain decomposition A. Heinlein, J. Knepper, A. Klawonn, O. Rheinbach	Equivalence of local- and global-best approximations and simple stable local commuting projectors in H(div) A. Ern, T. Gudi, I. Smears, M. Vohralik	Sparse discretization of sparse control problems E. Herberg, M. Hinze, H. Schumacher
14:20	On a scalable, highly robust domain decomposition method with dynamic load balancing M. Kühn, A. Klawonn, O. Rheinbach		Numerical approximation of optimal control problems for hyperbolic conservation laws P. Schäfer Aguilar, S. Ulbrich
14:40	Machine learning in adaptive domain decomposition methods - predicting the geometric location of constraints A. Heinlein, A. Klawonn, M. Lanser, J. Weber	Fast diagonalized Schwarz smoothers for geometric multigrid preconditioning on unstructured meshes J. Witte, D. Arndt, G. Kanschat	A priori error estimates for fracture control problem M. Mohammadi, W. Wollner
15:00	Logistic regression for potential modeling S. Kost, H. Schaeben, O. Rheinbach, M. Eiermann	Guaranteed a posteriori error analysis for the mixed Laplace eigenvalue problem F. Bertrand, D. Boffi, R. Stenberg	Reduced basis methods – an application to variational discretization of parametrized elliptic optimal control problems A. Ahmad Ali, M. Hinze
15:20	Large scale non-autonomous differential Riccati equations B. Baran, P. Benner, J. Saak	Analysis of a boundary element method for homogenization of periodic structures G. Of, D. Lukas, J. Bouchala, J. Zapletal	Multigoal-oriented error control in optimization problems with nonlinear PDE constraints B. Endtmayer, U. Langer, I. Neitzel, T. Wick, W. Wollner
15:40	Fast computation of optimal damping parameters for linear vibrational systems I. Slapničar, N. Jakovčević Stor, Z. Tomljanović	On the numerical analysis of an integral equation formulation of the many-body dielectric problem in electrostatics M. Hassan, B. Stamm	Adaptive optimization of FSI problems with reduced order models J.K. Biehl, S. Ulbrich

S20.04 Dynamics and control Chair: S. Lucia HS 05	S22.04 Scientific computing Chair: P. Birken HS 42	S23.04 Applied operator theory Chair: O. Post SR 03	
Foundations and applications of infinite-dimensional input-to-state stability theory A. Mironchenko	Mean-field surrogate models of (semi-)dilute particle suspensions A. Vibe, N. Marheineke	Integration by parts on the law of the mdulus of the Brownian bridge M. Grothaus, R. Voßhall	14:00
	Simulation of generalized Newtonian fluids with the smoothed particle hydrodynamics method M. Simeunovic, H. Steeb	An agent based modeling of spatially inhomogeneous host-vector disease transmission W. Bock, T. Fattler, I. Rodiah	14:20
An ISS characterization for discontinuous discrete-time systems R. Geiselhart, N. Noroozi	Parallel FE solver for the stationary Navier-Stokes equations with adaptive grid refinement using a PU dual-weighted residual method J.P. Thiele, T. Wick	Homogenization of abstract evolutionary equations via unfolding S. Neukamm, M. Varga, M. Waurick	14:40
Optimal control of nonlinear dissipative systems F.E. Haller	Simulation of calcium waves in a heart cell on modern nulti-core parallel computing platforms C. Barajas, S. Kopecz, A. Meister, B.E. Peercy, M.K. Gobbert	Quantitative unique continuation principles and application to control theory for the heat equation M. Tautenhahn, I. Nakić, M. Täufer, I. Veselic	15:00
Tracking of non-feasible curves for underactuated nonlinear systems V. Grushkovskaya, A. Zuyev	Analysis of acoustic wave propagation in composite laminates via a spectral element method E. Perras, C. Zhang	The Tan 2Theta-theorem in fluid dynamics L. Grubisic, V. Kostrykin, K.A. Makarov, S. Schmitz, K. Veselic	15:20
A smooth start method for spherical robot based on sliding mode control T. Zhou, Y. Xu, B. Wu	Parallel-in-time solution of eddy current problems S. Friedhoff, J. Hahne, S. Schöps		15:40

	S01.02 **Multi-body dynamics** Chair: P. Betsch	S02.05 **Biomechanics** Chair: S. Brandstäter	S03.05 **Damage and fracture mechanics** Chair: A. Ricoeur
	SR 06	**HS 01**	**HS 50**
16:30	Improved initialization schemes for the time integration of constrained systems M. Arnold	Computational study of ventricular fibrillation by considering a strongly coupled electromechanical rat heart model D. Holz, M.T. Duong, M. Alkassar, S. Dittrich, S. Leyendecker	Identifying the non-local interactions of self-adhesive polymeric films with digital images of T-peeling B. Bagheri, K. Naumenko, H. Altenbach
16:50	A formulation for the dynamic analysis of multibody systems using non-redundant unified local velocity coordinates S. Holzinger, J. Gerstmayr	On the electro-chemo-mechanical modelling of stomach smooth muscle contraction L. Klemm, M. Bauer, E. Morales, R. Seydewitz, M. Böl	J-integral and cohesive zones of mixed-mode interface and matrix cracks J. Scheel, A. Ricoeur
17:10	On mechanical DAE systems within the framework of optimal control S. Schneider, P. Betsch	Active-strain electromechanics for the computational modelling of gastric peristalsis S. Brandstaeter, S.L. Fuchs, A. Gizzi, R.C. Aydin, C.J. Cyron	A finite fracture mechanics approach for interlaminar crack initiation using the scaled boundary finite element method S. Dölling, S. Bremm, S. Hell, W. Becker
17:30	Utilizing general relations of balance for the improvement of discrete mechanics time integration schemes: application to the double pendulum E. Oborin, H. Irschik	Simulating electromechanical delay by using a multi-scale model of the muscle-tendon complex L. Schmid, T. Klotz, T. Siebert, O. Röhrle	Implementation of generalized mechanical interfaces L. Spannraft, J. Mergheim, P. Steinmann
17:50	Variational formulation and discretization of multi-body systems with fluid-structure interaction at low Reynolds number D. Kern, M. Gross	Towards overcoming the bottleneck of optimizing control parameters in finite element active human body models O.V. Martynenko, K. Stollenmaier, C. Endler, F.T. Neininger, S. Schmitt, D.F. Haeufle	An interface model to account for damage and plasticity at grain boundaries S. Rezaei, J. Rezaei Mianroodi, T. Brepols, S. Wulfinghoff, S. Reese
18:10		A cable model for accurate and efficient forward-dynamic musculoskeletal system simulation M.H. Gfrerer, B. Simeon	

S04.08 Structural mechanics Chair: S. Klinkel Audimax	S04.09 Structural mechanics Chair: F. Barthold SR 04	S05.05 Nonlinear oscillations Chair: L. Dostal HS 16	
Topology optimization combined with element-by-element solution techniques R. Sala, C. Kuhn, C. Sator, R. Müller	Prediction of stress states in tramway rails by means of a principle of virtual power-based, enhanced beam theory approach P. Hasslinger, C. Hellmich, S. Scheiner	Aeroelastic limit-cycle oscillations of piezoelectric energy harvesters A. Zilian	**16:30**
Topology optimization with geometrical nonlinearity responding to uncertain loading J. Kato, T. Nishino	Role of diameter and percentage of SMA bars as reinforcement in strength and residual displacement of concrete beams M.A.E. Molod, F. Barthold, P. Spyridis	A time-integration algorithm for non-linear dynamic systems of first and second order H.J. Holl	**16:50**
Redundancy distribution in structures M. von Scheven, F. Geiger, J. Gade, E. Ramm, M. Bischoff	Effect of uncertain parameters on the deflection of beams T. Reppel, T.F. Korzeniowski, K. Weinberg	Bouc hysteresis without an elastic restoring force under white noise excitation using the beta distribution C.H. Kasess, H. Waubke	**17:10**
A variational formulation for motion design of adaptive structures R. Sachse, M. Bischoff	Non-material finite element rod model for out-of-plane bending of an elastic strip with natural curvature C. Schmidrathner, Y. Vetyukov	Dynamical characteristics of electromechanical energy dissipation due to translatory motion: a minimal example F. Boy, H. Hetzler, A. Tchomgue Simeu	**17:30**
Phase field modeling with IGA and FEM: Error surveillance in the transition zone M. Klassen, I. Münch, S. Klinkel	Comparison of performance and accuracy of the FETI-methods and a direct sparse FE-solver for truss structures C.B. Schmaußer, G. Müller	Steady state dynamics of pre-stressed, piezoelectrically excited circular plates – a harmonic balance approach F. Toth, M. Kaltenbacher	**17:50**
Topology optimization with isogeometric analysis and phase field modeling I. Münch, M. Klassen, W. Wagner	Shape memory alloy truss lattice material M. Kuczma	Experimental nonlinear modal analysis of structures with nonlinear dissipation M. Scheel, M. Krack	**18:10**

	S06.06 Material modelling in solid mechanics Chair: M. Todt BIG HS	S06.07 Material modelling in solid mechanics Chair: T. Antretter SR 05	S07.06 Coupled problems Chair: A. Jung HS 21
16:30	Constitutive modelling of woven fiber reinforced polymer S. Tunger, Z. Akbar, J.F. Hofmann, P. Eversmann, D. Kuhl	Modelling ductile damage and fracture in extrusion-formed thin-walled aluminium components S. Baltic, R. Hammer, J. Magnien, T. Antretter	Phase-field simulations of cracks under dynamic loading K. Weinberg, C. Bilgen, C. Wieners
16:50	Multiscale modeling and optimization of braid-reinforced polymer coil springs M. Luger, R. Traxl, U. Hofer, B. Hirzinger, R. Lackner	A comparison between the performance of different Mindlin's theory based strain gradient models in local singularities R. Makvandi, D. Juhre	Modeling of hydraulically induced fractures in elastic-plastic solids D. Kienle, M. Keip
17:10	Multiscale modeling of viscoelastic behavior of braid-reinforced polymer components U. Hofer, M. Luger, R. Traxl, R. Lackner	A new anisotropic hyperelastic material model for single layer blue phosphorus F. Shirazian, R. Ghaffari, M. Hu, R.A. Sauer	Hydro-mechanics of fluid-filled fractures - a discussion of numerical coupling schemes P. Schmidt, H. Steeb
17:30	Orthotropic hyperelastic energy functions for the geometrically nonlinear simulation of textile membrane structures M. Motevalli, J. Uhlemann, N. Stranghöner, D. Balzani	Prandtl-Reuss model without safe-load conditions K.T. Kisiel	A method on aerodynamic load transfer to the flexible car-body of high speed train W. Dou, L. Zhang
17:50	Invariant formulation of anisotropic plasticity for fiber-reinforced composites: rate-type models with anisotropic, non-linear kinematic hardening S. Gaddikere Nagaraja, M. Pletz, C. Schuecker	Automatic analysis of the stress-strain response of rheological models T. Schultz, R. Müller	
18:10			

S08.04 Multiscales and homogenization Chair: M. Keip HS 41	S10.01 Turbulence and reactive flows Chair: A. Scholtissek HS 03	S11.05 Interfacial flows Chair: M. Bestehorn HS 02	
Computational finite strain homogenization: reduced basis methods and beyond O. Kunc, F. Fritzen	Pulverised fuel flames: fully-resolved and Euler-Lagrange simulations O.T. Stein	Effects of fluid rheology and wetting properties on the droplet motion by a shear flow B. Barwari, S. Burgmann, A. Bechtold, M. Rohde, U. Janoske	**16:30**
		Modelling of shear driven drop motion and groove interaction on smooth rigid substrates P.M. Seiler, I.V. Roisman, C. Tropea	**16:50**
An artificial neural network based solution scheme to periodic homogenization F.S. Goekuezuem, L.T.K. Nguyen, M. Keip	Adjoint-based sensitivity analysis of complex combustion models M. Lemke, L. Cai, J. Reiss, H. Pitsch, J. Sesterhenn	A novel two-step model to investigate turbulent gas flows shearing thin liquid films A. Bender, A. Stroh, B. Frohnapfel, P. Stephan, T. Gambaryan-Roisman	**17:10**
Application of a machine learning and data mining approach to determine relationships in materials science F.E. Bock, N. Huber, B. Klusemann	Large-scale quasi-DNS of mixed-mode turbulent combustion T. Zirwes, F. Zhang, P. Habisreuther, H. Bockhorn, D. Trimis	Numerical investigation of the liquid-jet formation during water-hammer experiments V. Bogdanov, S. Adami, N.A. Adams	**17:30**
Adaptivity in reduce order computational homogenization using neural networks M. Fernández, F. Fritzen	Hierarchical parcel swapping: an efficient mixing model for turbulent reactive flows T. Starick, H. Schmidt	Effect of a rotating magnetic field on the decay of a free-falling metal jet T. Kasper, R. Schwarze	**17:50**
Computational runtime acceleration within TPM² environment F. Bartel, T. Ricken, J. Schröder, J. Bluhm	Multifidelity uncertainty quantification of reactive shock-bubble interaction with detailed chemistry L. Paehler, N.A. Adams		**18:10**

	S12.05 Waves and acoustics Chair: P. Borejko	S13.04 Flow control Chair: W. Schröder	S14.08 Applied analysis Chair: U. Stefanelli
	HS 34	SR 07	HS 32
16:30	Comparison of different models for stress singularities in higher order finite element methods for elastic waves J. Bulling, H. Gravenkamp	Temporal prediction horizons of adjoint calculations in turbulent flow S. Knechtel, J. Sesterhenn	Homogenization of high-contrast Mumford-Shah energies C.I. Zeppieri
16:50	Spectral super elements for beams with arbitrary cross section A. Greim, G. Müller	Adjoint based topology optimization of a duct bend S. Goeke, O. Wünsch	Homogenization of linear elasticity with slip-displacement conditions T. Wolfer, M.A. Peter
17:10	Intersection of two elastic waves in the region of material nonlinearity in an elastic layer Y. Wang, W. Chen, C. Zhang	A numerical RANS-based model of a nanosecond pulsed plasma actuator for flow control over an airfoil R. Aslani, M. Krieger	Homogenization of one-dimensional discrete optimal transport P. Gladbach, E. Kopfer, J. Maas, L. Portinale
17:30	Numerical study of nonlinear elastic wave propagation in locally damaged engineering structures B. Ankay, C. Zhang		Homogenization result for a solid-solid phase transformations model M. Jesenko, P.W. Dondl
17:50	An analytical approach for assessing wave scattering by pipelines in irregularly compacted soil W.E. Weber, G.D. Manolis		Quantitative stochastic homogenization: recent advances and perspectives J. Fischer
18:10	Green's function for a horizontally layered anisotropic soil H. Waubke, W. Kreuzer, T. Hrycak, S. Schmutzhard		Transmission, reflection, and refraction at meta-material interfaces B. Schweizer

S15.05 Uncertainty quantification Chair: H. Gottschalk HS 07	S16.03 Shape & material optimization II Chair: T. Lahmer HS 06	S17.05 Applied and numerical linear algebra Chair: M. Lanser Elise-Richter HS	
Multifidelity reliability estimation C. Proppe	Metamodel assisted optimization of glued laminated timber beams by using metaheuristic algorithms S. Pech, G. Kandler, M. Lukacevic, J. Füssl	Numerical behavior of GMRES for singular systems M. Rozloznik, K. Morikuni	**16:30**
Stochastic multi-level analysis of bone tissue S.K. Shivanand, B. Rosic, H.G. Matthies	Shape optimization of bridge decks considering the Vortex-induced vibration phenomena Z. Jaouadi, T. Abbas, G. Morgenthal, T. Lahmer	Oblique projections in deflating GMRES type methods M. Bolten, N. Bozovic, A. Frommer	**16:50**
Bayesian inversion for electrical impedance tomography M. Multerer, R. Gantner	Structural and material optimization based on thermodynamic principles D.R. Jantos, K. Hackl, P. Junker	Augmentation of Krylov subspaces for Lyapunov equations K. Soodhalter	**17:10**
Bayesian analysis for Poisson-Boltzmann equation modeling electrical impedance tomography devices L. Taghizadeh, C. Heitzinger	Intrinsic formulation of KKT conditions and constraint qualifications on smooth manifolds. R. Bergmann, R. Herzog	Shifted block FOM with restarts and low-rank modifications K. Lund, A. Frommer, D.B. Szyld	**17:30**
Parameter estimation in a macroscopic production model based on a PDMP S. Göttlich, S. Knapp, C. Schillings	Composite step method for optimization of equality constrained problems on manifolds J. Ortiz, A. Schiela	Approximation of the trace of matrix functions based on decay bounds C. Schimmel, A. Frommer	**17:50**
Bayesian inversion for nanoscale field-effect sensors using the stochastic drift-diffusion-Poisson-Boltzmann system A. Khodadadian, C. Heitzinger	Geometry processing problems using the total variation of the normal vector field J. Vidal-Nunez, R. Herzog, R. Bergmann, S. Schmidt, M. Herrmann	Automated local Fourier analysis (aLFA) K. Kahl, N. Kintscher	**18:10**

	S18.05 Numerical methods of differential equations Chair: M. Ohlberger HS 31	S18.06 Numerical methods of differential equations Chair: I. Perugia SR 08	S19.05 Optimization of differential equations Chair: M. Siebenborn HS 30
16:30	A nonconforming Trefftz virtual element method for the fluid fluid interface problem L. Mascotto, A. Pichler	hp-FEM for the spectral fractional Laplacian in polygons J.M. Melenk, L. Banjai, C. Schwab	Finite element error estimates in $L^2(\Omega)$ for regularized discrete approximations to the obstacle problem D. Hafemeyer, C. Kahle, J. Pfefferer
16:50			A model problem for optimal control of a parabolic PDE fully coupled to ODEs S. Kimmerle
17:10	Resonance problems in waveguides with backward propagating modes L. Nannen	A reduced basis method for fractional diffusion operators T. Danczul, J. Schöberl	A priori error estimates for an optimal control problem governed by a variational inequality of the second kind C. Meyer, M. Weymuth
17:30	A beam propagation method for perturbated Gaussian beams C. Pflaum	Exponential convergence of an hp-FEM approximation for parabolic fractional diffusion A. Rieder, J.M. Melenk	Numerical analysis for parabolic time-optimal control problems with bang-bang controls B. Vexler, L. Bonifacius, K. Pieper
17:50	On the computation of localized Schrödinger eigenstates R. Altmann, D. Peterseim	Numerical homogenization of heterogeneous fractional Laplacians D.L. Brown, J. Gedicke, D. Peterseim	
18:10	Localized Orthogonal Decomposition for the wave equation R. Maier, D. Peterseim	Optimal adaptivity and preconditioning for the fractional Laplacian M. Faustmann, J.M. Melenk, M. Parvizi, D. Praetorius	

S20.05 **Dynamics and control** Chair: R. Geiselhart **HS 05**	S21.01 **Mathematical signal and image processing** Chair: C. Kirisits **SR 02**	S22.05 **Scientific computing** Chair: H. Anzt **HS 42**	
Approximation of output-feedback robust model predictive controllers via deep learning B. Karg, S. Lucia	Numerical algorithms for stabilised backward image evolutions J. Weickert, M. Welk, L. Bergerhoff, M. Cardenas, G. Gilboa	Computational aspects of a bound of Lagrange D. Stefanescu	**16:30**
Specialized adaptive algorithms for the model predictive control of PDEs L. Grüne, M. Schaller, A. Schiela		A performance comparison of different shell elements for upper bound limit analysis V. Stembera, J. Füssl	**16:50**
Vision- and MPC-based control of a power-cube serial robot J. Fehr, P. Schmid, G. Schneider, P. Eberhard	Riemannian structure and flows for smooth geometric image labeling F. Savarino, C. Schnörr	Partitioned adaptive multirate time integration for coupled systems of ODEs P. Birken, P. Meisrimel	**17:10**
Optimal control of differential-algebraic system using regularization techniques A. Ilchmann, J. Witschel, K. Worthmann	Geometric numerical integration of the assignment flow A. Zeilmann, F. Savarino, S. Petra, C. Schnörr	Simulating coupled free and porous media flow with lattice Boltzmann methods C. Schwarzmeier, U. Rüde	**17:30**
Model predictive control for linear differential-algebraic equations based on regularisation A. Ilchmann, J. Witschel, K. Worthmann	Generalised quantiles for multivariate images M. Welk	A modified lattice Boltzmann formulation with adaptive numerical dissipation through independent control over higher-order moments S.A. Hosseini, N. Darabiha, D. Thévenin	**17:50**
Cycle-based adaption of a model-predictive control strategy for injection molding machines C. Froehlich, W. Kemmetmüller, A. Kugi	A method for image decomposition and particle quantification S. Günther, S. Odenbach	Discontinuous Galerkin methods with new multigrid preconditioners L.M. Versbach, P. Birken, G. Gassner	**18:10**

	S23.05 **Applied operator theory** Chair: J. Rohleder **SR 03**
16:30	Perturbation of positive semigroups A. Bátkai
16:50	Orthogonality and selfadjointness for extensions of inner products C. Wyss
17:10	Riesz bases and controllability for port-Hamiltonian systems B. Jacob, J. Kaiser
17:30	Solvability of the inhomogeneous Cauchy-Riemann equation for weighted smooth vector-valued functions K. Kruse
17:50	
18:10	

Thursday, February 21

08:30	**Contributed Sessions**	
	all lecture rooms	24 parallel sessions
10:30	**Coffee Break**	
	Festsaal, Hof 8, Student Space	Refreshment including coffee, tea, soft drinks, fruits, and biscuits
11:00	**Plenary Lecture - Mathematics**	
	Audimax	**Dieter Bothe** (TU Darmstadt) *Modeling and simulation of transport processes at fluid interfaces systems* Chaired by Dorothee Knees
12:00	**Plenary Lecture - Mechanics**	
	Audimax	**Dennis Kochmann** (ETH Zürich) *Mechanical metamaterials* Chaired by Jörg Schröder
13:00	**Lunch**	
		Information on lunch options is available on page 20
14:00	**Contributed Sessions**	
	all lecture rooms	23 parallel sessions
16:00	**Coffee Break**	
	Festsaal, Hof 8, Student Space	Refreshment including coffee, tea, soft drinks, fruits, and biscuits
16:30	**Plenary Lecture - Mechanics**	
	Audimax	**Dwight Barkley** (University Warwick) *A fluid mechanic's analysis of the tea-cup singularity* Chaired by Marc Avila
17:30	**Contributed Sessions**	
	all lecture rooms	12 parallel sessions

Contributed Sessions

	S01.03 **Multi-body dynamics** Chair: A. Steindl **HS 16**	S02.06 **Biomechanics** Chair: M. Stoffel **HS 01**	S03.06 **Damage and fracture mechanics** Chair: T. Seelig **HS 50**
08:30	Consistent Euler-Lagrange approach for particulate flow modelling with arbitrary particle size/mesh resolution ratio F. Evrard, B. van Wachem	Parametric investigation of permeability of vertebral bone assuming a regular microstructure Z. Trivedi, C. Bleiler, A. Wagner, O. Röhrle	A computational framework for brittle crack-propagation based on efficient virtual element method A. Hussein, F. Aldakheel, B. Hudobivnik, P. Wriggers, P. Guidault, O. Allix
08:50	An IGA-based three dimensional Cosserat rod for multibody dynamics S. Benatti, A. Tasora, D. Mangoni	Multiscale modeling provides differentiated insights to fluid flow-driven stimulation of bone cellular activities S. Estermann, S. Scheiner	Crack paths in ferroelectrics: crack growth simulation and experiments Z. Wang, A. Ricoeur
09:10	Nodal-displacement-based derivation of the floating frame of reference formulation: avoiding inertia shape integrals A. Zwölfer, J. Gerstmayr	Numerical simulation of function-perfusion processes in the human liver using the theory of porous media L. Lambers, T. Ricken, M. König	Micromechanical simulation of crack growth resistance curve in ferroelectrics M. Kuna, S. Kozinov
09:30	Model order reduction of structures with fractional viscoelastic coupling A. Leenders, M. Burgwitz, M. Wangenheim	On osmotic pressure and damage in hyperelastic biphasic fiber reinforced articular cartilage F. Egli, T. Ricken	Mixed-mode fracture: the missing link between J-vector criterion and conventional fracture criteria P. Judt, A. Ricoeur
09:50	A new approach for the simulation of flexible multibody systems and its relation to existing ones R. Winkler, J. Gerstmayr	Stability of crack growth in anisotropic materials at finite strains J. Eckmann, O. Gültekin, G.A. Holzapfel	Scaled boundary finite element l modelling of thermally induced crack propagation M.D. Iqbal, C. Birk
10:10		Quantification of microdamage formation during fatigue testing of individual trabeculae J. Fischer, M. Frank, P.J. Thurner	Crack propagation using incompatible modes in structural elements A. Stanic, B. Brank, A. Ibrahimbegovic

S04.10 Structural mechanics Chair: A. Tkachuk Audimax	S04.11 Structural mechanics Chair: A. Popp SR 04	S05.06 Nonlinear oscillations Chair: K. Ellermann SR 06	
Structure-preserving integrators for discrete mechanical systems subject to general holonomic constraints A. Janz, P. Betsch	Model order reduction of a modular scale model of a high rise building N. Walker, P. Eberhard	Modeling and simulation of metal bellows in vacuum interrupters A. Boyaci, C. Simonidis, D. Gentsch	**08:30**
GENERIC consistent discretisation in space and Energy-Momentum-Entropy consistent schemes for open thermomechanical systems M. Schiebl, P. Betsch	Numerical investigation of the movements of lapping particles R. Bilz, K. de Payrebrune	Nonlinear thermomechanical vibrations of bimodular beams R. Heuer	**08:50**
An alternative conservative/dissipative time integration scheme for nonlinear mechanical systems C.G. Gebhardt, R. Rolfes	Effects of a temperature cycle on a rotating shrink fit with FGM-hub E. Arslan, T. Apatay, W. Mack	Nonlinear responses of metastructures with bistable attachments Y. Xia, M. Ruzzene, A. Erturk, G. Litak	**09:10**
Mixed frameworks and structure preserving integration for coupled electro-elastodynamics M. Franke, R. Ortigosa, A. Janz, A.J. Gil, P. Betsch	Investigation of elastic grinding pins F. Lamping, K. de Payrebrune		**09:30**
A numerical approach for dynamic analysis of solids in boundary representation A. Mendez Salas, M. Chasapi, S. Klinkel	Development of a simulation model for the automatic optimization of tools for multi-dimensional tube forming R. Derr, A. Jung, S. Diebels		**09:50**
Time-adaptive computations for the mortar finite element method M. Grafenhorst, S. Hartmann			**10:10**

	S06.08 Material modelling in solid mechanics Chair: C. Hellmich	S06.09 Material modelling in solid mechanics Chair: K. Weinberg	S07.07 Coupled problems Chair: B. Kiefer
	BIG HS	**SR 05**	**HS 21**
08:30	Strain induced crystallization and fracture of rubber-like materials C. Linder, R. Rastak, P. Kammardi Arunachala	Computational modelling of inertia friction welding R.A. Williams, D. Barbera, A. McBride	High-order numerical methods for the thermal activation of SMA fibers T. Gleim, D. Kuhl, M. Schleiting, A. Wetzel, B. Middendorf
08:50	Hyperelastic modelling and experimental characterisation of cellular rubber A. Ricker, N.H. Kröger, M. Ludwig, R. Landgraf, J. Ihlemann	Thermo-mechanical analysis of a steam turbine rotor J. Eisenträger, K. Naumenko, Y. Kostenko, H. Altenbach	
09:10	Application of different plasticity models to PC/ABS blends within a micromechanical unit cell approach J. Hund, T. Seelig	Effect of crystallographic orientation in modelling of anisotropic plasticity with an analytical yield function S. Neuhaus, K. Srivastava, S. Scholl, S. Diebels	3D virtual elements for finite strain thermo-plasticity B. Hudobivnik, F. Aldakheel, P. Wriggers
09:30	Experimental investigation, modelling and simulation of the DLO-effect using the example of thermo-oxidatively aged nitrile rubber B. Musil, M. Johlitz, A. Lion	Numerical analysis of residual stresses on microscale and mesoscale in hot bulk forming parts under specific cooling S. Uebing, D. Brands, L. Scheunemann, M. Sarhil, R. Niekamp, C. Kock, A. Chugreev, B. Behrens, J. Schröder	Coupled boundary elements and finite elements for applications in thin structures M.P. Rajski, M. Harmel, R.A. Sauer
09:50	A phase field model for thermo-oxidative aging in cracked polymers J. Voges, D. Juhre	On predictive modelling of yield stress increase in fresh cement paste H. Huang, A. Zilian	Lagrangian perspective on multi-scale skeletal muscle models S. Plunder, B. Simeon
10:10	Gibbs potential-based thermodynamics of rubber viscosity and viscoelasticity at large strains R. Plachy, S. Scheiner, C. Hellmich	Mixed XFEM formulation for the simuation of heterogeneities including elasto-plastic material behaviour S. Löhnert	Ingredients for advanced blood damage estimation of medical devices: log-morph with variational multiscales L. Pauli, S. Haßler, M. Behr

S07.08 Coupled problems Chair: R. Jänicke SR 07	S08.05 Multiscales and homogenization Chair: H.J. Böhm HS 41	S10.02 Turbulence and reactive flows Chair: B. Frohnapfel HS 03	
Towards multifield discrete element modeling of concrete structures C. Flack, D. Dinkler	Simulation of dual-phase steel using the finite cell method and voxel-based microstructure data Y.F. Fangye, N. Miska, D. Balzani	Phase-field simulations of turbulent two-phase flows M. Avila, B. Song, C. Plana, J.M. Lopez, A. Vela Martin	08:30
High-performance computational modelling of concrete ageing M. Habera, A. Zilian	Goal-oriented adaptivity on mean-field and full-field homogenization methods considering hierarchical unit cells X. Ju, R. Mahnken		08:50
Formulation and calibration of a desorption isotherm for maturing concrete P. Gamnitzer, M. Drexel, A. Brugger	Homogenization of cementitious materials: stiffness, creep, strength B. Pichler, C. Hellmich	Direct numerical simulation of flow over rough walls P. Forooghi, A. Stroh, B. Frohnapfel	09:10
Computational modeling of drying shrinkage in early-age concrete M. Ghasabeh, S. Göktepe	Multiscale analysis of heterogeneous materials in boundary representation M. Praster, R. Reichel, S. Klinkel	Turbulence measurements in high-speed flows with a new Stereo-Dual-PIV system A. Schreyer, I. Janssen	09:30
Particle finite element simulation of fresh cement pastes - inspired by additive manufacturing techniques J. Reinold, J.J. Timothy, G. Meschke	Influence of specific core reinforcement designs on the stiffness behaviour of hybrid core sandwich panels I.C. Skrna-Jakl, D.H. Pahr	Harmonic and pulsatile flow in an aortic aneurysm model: experiments and simulations M.C. Bopp, S. Wegt, C. Tropea, S. Jakirlic, A. Bauer, N. Shokina, A. Krafft, J. Henning	09:50
Modeling of active multiphase materials M. Sauerwein, H. Steeb	Laminate-based modeling of semicrystalline polymers J. Ruck, P. Kloza, S. Gajek, T. Böhlke		10:10

	S11.06 Interfacial flows Chair: M. De Paoli HS 02	S12.06 Waves and acoustics Chair: F. Toth HS 34	S14.09 Applied analysis Chair: P. Dondl HS 32
08:30	Heat transfer modeling of confined bubble evaporation in a microchannel S. Sadir, M. Talebi, P. Woias, R. Dittmeyer, B. Frohnapfel, A. Stroh	Steady transonic dense gas flow past compression/expansion ramps revisited A. Kluwick, T. Cox	Crystallization and discrete differential geometry G. Friesecke
08:50	The curvature of an evaporating meniscus in a pressure driven flow through cyindrical pores T. Loimer	Multiple scales analysis of the undular hydraulic jump over horizontal surfaces D. Murschenhofer, W. Schneider	
09:10	The capillary rise as a benchmark for DNS wetting simulations D. Gründing, H. Marschall, D. Bothe	Growth and decay of waves in countercurrent air-water turbulent flows F. Zonta, M. Onorato, A. Soldati	A dipolar Gross-Pitaevskii equation with quantum fluctuations: self-bound states Y. Luo
09:30	The contact line advection problem M. Fricke, D. Bothe	Stationary single waves in turbulent free-surface flows M. Stojanovic, W. Schneider, D. Murschenhofer	Crystallization in the hexagonal lattice for ionic dimers M. Friedrich, L. Kreutz
09:50	Numerical simulation of suction cavitation in hydrodynamic journal bearings M. Schmidt, P. Reinke, T. Beckmann	Analysis of sound generation of sub- and super-sonic boundary layer flows Y. Zhang, M. Oberlack	Coupled self-organized hydrodynamics and Stokes models for suspensions of active particles P. Degond, S. Merino-Aceituno, F.V. Vergnet, H. Yu
10:10	Choking and hydraulic jumps in laminar flow B. Scheichl, R.I. Bowles, G. Pasias	Advanced finite element formulation for viscothermal acoustics M. Kaltenbacher, F. Toth, H.H. Guilvaiee	Continuum limit and homogenization of stochastic and periodic discrete systems - fracture in composite materials L. Lauerbach, S. Neukamm, M. Schäffner, A. Schlömerkemper

S15.06 **Uncertainty quantification** Chair: H. Gottschalk **HS 07**	S16.04 **MPEC and multilevel optimization** Chair: C. Clason **HS 06**	S17.06 **Applied and numerical linear algebra** Chair: M. Kühn **Elise-Richter HS**	
Multilevel and Multi-index Monte Carlo methods for the McKean-Vlasov equation R. Tempone	A complementarity-based approach to cardinality-constrained optimization A. Schwartz, M. Bucher	Approximating with random rank-one vectors D. Kressner	**08:30**
		Approximate interpolation of high dimensional, scattered data in tree tensor formats S. Kraemer, L. Grasedyck	**08:50**
Higher-order methods for stochastic differential equations L. Fischer	A multi-leader-multi-follower Nash game with application in gas markets D. Nowak, A. Schwartz, G. Zöttl	Hybrid compression of high-frequency Helmholtz integral operators S. Börm, C. Börst	**09:10**
Well posedness and convergence analysis of the ensemble Kalman inversion D. Blömker, C. Schillings, P. Wacker, S. Weissmann	Multi-leader-single-follower games with unique lower level solution in function space J. Becker, A. Schwartz	An algorithm for computing the restricted singular value decomposition with improved robustness I. Zwaan	**09:30**
Data assimilation using random set models: applications to dynamical system estimation T. Hoang, H.G. Matthies	Optimal control problems with control complementarity constraints C. Clason, Y. Deng, P. Mehlitz, U. Prüfert	A low-rank tensor method for optimal control of fractional PDEs G. Heidel, V. Khoromskaia, B. Khoromskij, V. Schulz	**09:50**
Probabilistic numerics and randomised Bayesian inverse problems J. Cockayne, M. Girolami, H.C. Lie, C. Oates, T.J. Sullivan, A. Teckentrup	Gradient-based solution algorithms for a class of bilevel optimization and optimal control problems with a non-smooth lower level C. Christof	Block partitioning of sparse rectangular matrices A. Dumitrasc, P. Leleux, U. Rüde	**10:10**

	S18.07 Numerical methods of differential equations Chair: I. Perugia HS 31	S18.08 Numerical methods of differential equations Chair: M. Ohlberger SR 08	S19.06 Optimization of differential equations Chair: W. Wollner HS 30
08:30	Multiscale methods for electromagnetic wave propagation in media with high contrast B. Verfürth	Differentiable mappings for finite element meshes D. Arndt, G. Kanschat	Optimal control of a rate-independent system constrained to balanced viscosity solutions S. Thomas, D. Knees
08:50		A second order multipoint flux mixed finite element method on hybrid meshes B. Radu, H. Egger	Solving quadratic multi-leader-follower games by smoothing the follower's best response A. Thünen, S. Steffensen, M. Herty
09:10	Space-time methods for Maxwell's equations J.I.M. Hauser, O. Steinbach	Anisotropic mesh adaptation: from crack propagation to topology optimization N. Ferro, S. Micheletti, S. Perotto	Optimal control of an abstract evolution variational inequality with application in homogenized plasticity C. Meyer, S. Walther
09:30	A hybrid WKB-based method for Schrödinger scattering problems in the semi-classical limit A. Arnold	Two-grid hp-version DGFEM for second-order quasilinear elliptic PDEs with agglomerated coarse meshes S. Congreve, P. Houston	On a PDE-constrained generalized Nash equilibrium problem with various multipliers V. Karl
09:50	Inf-sup stable space-time variational formulations for the second order wave equation M. Zank, O. Steinbach	Symbolic evaluation of hp-FEM element matrices on simplices T. Haubold	Exploitation of nonsmoothness in PDE-constrained problems instead of regularization O. Ebel, A. Walther, S. Schmidt
10:10		Mixed explicit implicit schemes for embedded boundary geometries S. May, M. Berger, F. Laakmann	A bilevel approach for parameter learning in inverse problems G. Holler, K. Kunisch, R.C. Barnard

S20.06 Dynamics and control Chair: R. Geiselhart HS 05	S21.02 Mathematical signal and image processing Chair: C. Kirisits SR 02	S22.06 Scientific computing Chair: J. Saak HS 42	
Optimal periodic control of nonlinear chemical reactions with a time-varying flow rate A. Zuyev, A. Seidel-Morgenstern, P. Benner	Deblurring and denoising using Tikhonov functionals with imperfect forward operators and epsilon-insensitive distances P. Gralla, I. Piotrowska-Kurczewski, P. Maass	On empirical system Gramians S. Grundel, C. Himpe, J. Saak	**08:30**
Optimal control of district heating systems D. Linn, J. Mohring, N. Siedow	Musical instrument separation on shift-invariant spectrograms via stochastic dictionary learning S. Schulze, E.J. King	Criss-cross algorithms for computing the spectral value set abscissa and radius P. Benner, T. Mitchell	**08:50**
Coordinate-invariant linear quadratic control E.R. Burnett, A.J. Sinclair, E.A. Butcher	Unsupervised Label Learning on Manifolds by Geometric Assignment A. Zern, M. Zisler, F. Åström, S. Petra, C. Schnörr	Accelerated computation of the matrix disc function via Direct Acyclic Graph Scheduling M. Köhler, J. Saak	**09:10**
Adjoint sensitivity equations in optimal control of differential-algebraic equations D. Bankmann	Extraction of wavefront sets by deep convolutional neural networks and shearlets H. Andrade Loarca, G. Kutyniok, O. Öktem, P. Petersen	Adaptive space-time isogeometric analysis of parabolic initial-boundary value problems U. Langer, S. Matculevich, R. Repin	**09:30**
Optimal feed forward control of hydraulic drive systems with long pipelines C. Pietschnig, L. Marko, W. Kemmetmüller, A. Kugi	The mismatch principle: statistical learning under large model uncertainties M. Genzel, G. Kutyniok	An eigensolver for the Hermitian Dirac operator with multigrid acceleration A. Strebel, A. Frommer, K. Kahl, M. Rottmann	**09:50**
Feedback and feedforward control concepts to improve road holding for passenger cars F. Klinger, J. Edelmann, M. Plöchl	Dimension reduction in learning tasks A. Breger, M. Ehler, B.S. Gerendas, J.I. Orlando, U. Schmidt-Erfurth		**10:10**

Contributed Sessions

	S01.04 **Multi-body dynamics** Chair: R. Winkler **HS 16**	S02.07 **Biomechanics** Chair: A.E. Ehret **HS 01**	S03.07 **Damage and fracture mechanics** Chair: T. Böhlke **HS 50**
14:00	A model-based strategy for safety assessment of a robot arm interacting with humans N. Kovincic, A. Müller, H. Gattringer	Medical images registration with finite elements and mechanical regularization M. Genet	Mechanical microstructure characterization of discontinuous-fiber reinforced composites by means of experimental-numerical micro tensile tests M. Schober, K. Dittmann, P. Gumbsch, T. Kuboki, J. Hohe
14:20	Kino-geometric modeling: insights into protein molecular mechanisms D. Budday, S. Leyendecker, H. van den Bedem		Numerical analysis of the thermally induced damage in remote laser cut carbon fiber reinforced polymers B. Schmidt, M. Rose, M. Zimmermann, M. Kästner
14:40	Optimal planning and control of a Segway model taking into account spatial obstacles C. Zauner, H. Gattringer, A. Müller, M. Jörgl	Data-driven constitutive modeling of patient-specific cartilaginous tissue K. Linka, M. Itskov, S. Nebelung, D. Truhn	Development and validation of a virtual process chain for sheet molding compound composites J. Görthofer, N. Meyer, L. Schöttl, A. Trauth, M. Schemmann, P. Pinter, M. Hohberg, T. Dora Pallicity, K.A. Weidenmann, P. Elsner, F. Henning, A. Hrymak, T. Seelig, L. Kärger, T. Böhlke
15:00	Inverse dynamics of an industrial robot using motion constraints T. Lauß, K. Sherif, W. Steiner	Validation of aortic wall motion measurement by 4D ultrasound and effects of measurement uncertainty on inverse identificaion of the wall's constitutive behavior C. Blase, W. Derwich, T. Schmitz-Rixen, C. Fritzen, A. Huß, A. Wittek	Development of a novel damage approach on the microstructure for modelling woven Ceramic Matrix Composites M. Reuvers, S. Rezaei, T. Brepols, S. Reese
15:20	Numerical calculations of transient states taking into the consideration the friction in joints of medical robot using the FEM G. Ilewicz, A. Harlecki	An efficient solver for CT based nonlinear microFE simulations of trabecular structures M. Stipsitz, D.H. Pahr	Verification and validation of a 2D energy based peridynamic state-based failure criterion C. Willberg, M. Rädel, H. Falk
15:40	Time-optimal control of a vehicle on a race track using a Pacejka tire model P. Eichmeir, S. Oberpeilsteiner, T. Lauß, W. Steiner	Histology-based semi-automated 3D reconstruction and simulation of skeletal muscle tissue R. Kuravi, A. Oswald, K. Leichsenring, M. Böl, A.E. Ehret	Computationally effective spot-weld fatigue life estimation for vehicle components M. Zigo, E. Arslan, W. Mack, G. Kepplinger

S04.12 Structural mechanics Chair: R. Sachse Audimax	S04.13 Structural mechanics Chair: J. Kato SR 04	S06.10 Material modelling in solid mechanics Chair: M. Petersmann BIG HS	
A proper symplectic decomposition for inelastic shells A.D. Nguyen, D.T. Truong, B. Markert	Specimen design for extreme uniaxial tension-compression tests of rubber materials L. Kanzenbach, J. Ihlemann	Application of model order reduction to a finite element model of cryogenic turning S. Becker, H. Hotz, B. Kirsch, J.C. Aurich, R. Müller	**14:00**
Towards the incorporation of damage into solid-shells based on reduced integration O. Barfusz, T. Brepols, J. Frischkorn, S. Reese	DIC-measurement and its approach for the FEM-simulation of "Die-Less-Hydroforming" A. Metzger, D.C. Ruff, T. Ummenhofer	On matrix representations of tensor algebra in continuum physics R. Schlebusch	**14:20**
On boundary conditions and constraints for representative volume elements of a two-scale shell formulation J. Zoller, F. Gruttmann	Experiments on wave propagation in soft resins S. Aghayan, S. Bieler, T. Reppel, K. Weinberg	Automatic generation of material laws based on rheological models using a genetic algorithm H. Wulf, R. Gypstuhl, R. Kießling, J. Ihlemann	**14:40**
Coulomb dry friction contact in a non-material shell finite element model for axially moving endless steel belts J. Scheidl, Y. Vetyukov	Comparison of structured and conforming meshes in FE analyses of textile reinforced air spring bellows N. Heinrich, J. Ihlemann	Symmetries for 4th and higher order tensors in generalized continua M.V. d'Agostino, R.J. Martin, A. Danescu, P. Neff	**15:00**
Structural mechanics of endovascular stent grafts A. Popp, I. Steinbrecher, C. Meier	Modal flatness analysis of thin sheets P.G. Gruber	On the change of the reference configuration and its application within FEM simulation R. Landgraf, J. Ihlemann	**15:20**
Impact of thin walled square aluminum tubes N. Jafarzadeh Aghdam, U. Bhaskara Chary Tatikonda, J. Bühring, N.R. Mekala, K. Schröder	On the macro to micro transformation M. Jahn, M. Meywerk	A juxtaposition of data driven and stochastic finite element analyses for problems with noisy material data T.F. Korzeniowski, T. Reppel, K. Weinberg	**15:40**

Contributed Sessions

	S06.11 **Material modelling in solid mechanics** Chair: J. Stratmann **SR 05**	S07.09 **Coupled problems** Chair: A. Ricoeur **HS 21**	S07.10 **Coupled problems** Chair: T. Gleim **SR 07**
14:00	Modelling of cellular materials by a microsphere-based material model A. Jung, T. Bleistein, S. Diebels	Modeling the actuation and sensing behavior of an IPMC within the framework of the Theory of Porous Media J. Bluhm, S. Serdas, J. Schröder	FORC measurements - characterisation of interparticle interaction in magnetoactive elastomers (MAE) M. Schliephake, S. Odenbach
14:20	Static wetting on stretched soft substrates S. Heyden, R. Style, K.A. Smith-Mannschott, E. Dufresne	Interfacial energies depending on curvature: the drastic loss of elastic coupling on small scales and its impact on multiphase mechanics P. Kurzeja	Viscosity increase caused by anchoring of functionalized magnetic nanoparticles in nematic liquid crystals J. Jahn, S. Odenbach
14:40	Soil modelling with a DEM-Lookup approach J. Jahnke, S. Steidel, M. Burger	Non-locality in multi-scale poroelasticity: phenomena, computational homogenization and numerical model reduction R. Jänicke	Coupling and computation of electromagnetism and mechanics B.E. Abali
15:00	An extended hypoplastic model incorporating the coordination number for the simulation of granular flow A.R. Leon Bal, T.S. Dang, G. Meschke	A mixed least-squares finite element formulation within the framework of the theory of porous media A. Schwarz, S. Averweg, J. Bluhm, J. Schröder	Development of a macro-model for magnetorheological elastomers based on microscopic simulations K.A. Kalina, P. Metsch, J. Brummund, M. Kästner
15:20	On the structural correlation in plastically deformed disordered materials F. Bamer, J. Stratmann, F. Ebrahem, B. Markert	The Taylor-least-squares time integrator scheme applied to tracer equations of a sea ice model C. Nisters, J. Schröder, R. Niekamp, T. Ricken	Coupling of a peridynamic continuum with an analytical solution M. Becker
15:40			

S08.06 Multiscales and homogenization Chair: M. Schneider HS 41	S08.07 Multiscales and homogenization Chair: T. Bartel SR 03	S10.03 Turbulence and reactive flows Chair: B. Frohnapfel HS 03	
Virtual elements for the homogenization of polycrystalline materials: evidence of locking-free responses with strong anisotropies M. Marino, B. Hudobivnik, P. Wriggers	Finite element simulations and nonlinear homogenization of fibre reinforced elastomer composite T. Ceglar, H.E. Pettermann	A new approach to simulate confined, premixed and slow combustion C. Gößnitzer, H. Steinrück	14:00
The explicit jump discretization with Lippmann-Schwinger solvers for thermal computational homogenization problems C. Dorn, M. Schneider	Magneto-electric product properties of multiferroic composites M. Labusch, J. Schröder	What can we learn from information-entropy about turbulence and Large-Eddy Simulation? L. Engelmann, I. Wlokas, A.M. Kempf	14:20
Investigation on numerical solution schemes for describing phase transformations by the Kampmann-Wagner numerical model J. Herrnring, B. Klusemann	Investigation of localized instabilities of stretching- and bending-dominated truss lattices treated as nonlocal generalized continua R.N. Glaesener, C. Lestringant, D.M. Kochmann	Vortex cores as barriers to the diffusion of vorticity in 2D turbulence S. Katsanoulis, M. Farazmand, G. Haller	14:40
Isogeometric multiscale modeling with Galerkin and collocation methods M. Amin Ghaziani, J. Kiendl, L. De Lorenzis	Homogenization-based multiscale design of truss metamaterials with controllable effective properties B. Telgen, D.M. Kochmann	Lagrangian perspectives on turbulent superstructures in Rayleigh-Bénard convection C. Schneide, A. Pandey, A. Klünker, K. Padberg-Gehle, J. Schumacher	15:00
Diffuse modelling of weak discontinuities P. Hennig, D. Schillinger, M. Kästner	Contact between shear-deformable beams with elliptical cross sections to represent dry-woven fabrics M. Magliulo, L. Beex, A. Zilian	RANS-type turbulence modelling using lie-symmetries D. Klingenberg, M. Oberlack	15:20
Implementing a microstructure model of rubber with self-organization into a FEM Software E. Oelsch, H. Wulf, J. Ihlemann	Classification of process induced porosity with topological data analysis P. Jäger, R. Traxl, R. Lackner		15:40

	S11.07 Interfacial flows Chair: T. Loimer HS 02	S12.07 Waves and acoustics Chair: M. Kaltenbacher HS 34	S14.10 Applied analysis Chair: U. Stefanelli HS 32
14:00	Numerical and experimental investigation on the flow behavior of liquids in narrow gaps L. Luberto, K. de Payrebrune	Towards an efficient direct noise computation of hydrodynamic-acoustic feedback mechanisms D. Kempf, T. Kuhn, C. Munz	Effective theories for atomistically thin films B. Schmidt
14:20	Convective dissolution in porous media: experimental investigation in Hele-Shaw cell M. De Paoli, M. Alipour, A. Soldati		
14:40	Effective permeability of a flow through a packed bed of beads between two walls affected by overlapping wall effects K. Boettcher, T. Neumann, P. Ehrhard	Helmholtz decomposition of compressible flow data at Mach 0.8 S. Schoder, C. Freidhager, M. Kaltenbacher	Variance reduction for effective energies of random lattices in the Thomas-Fermi-von Weizsäcker model J. Fischer, M. Kniely
15:00	Numerical investigation of aerosol deposition on single fibers S. Mohan, J. Chaudhuri, L. Gödeke, P. Ehrhard	Uncertainty quantification for direct noise computation of cavity feedback T. Kuhn	Rigorous derivation of the effective equation of a linear reaction system with different time scales A. Stephan, A. Mielke
15:20	Flow through randomly-oriented fibrous filters J. Chaudhuri, K. Boettcher, P. Ehrhard	Numerical investigation of the resonance behavior of flow-excited Helmholtz resonators M. Weitz, S. Schoder, M. Kaltenbacher	On a Gamma-limit of Willmore functionals with additional curvature penalization term H. Olbermann
15:40	Estimating the efficiency of flow-through filters for marine diesel engine applications using a CFD-QMOM approach A. Fiedler, M. Kleinhenz, A. Döring	Numerical calculation of aerodynamic noise generated from missile in low mach number flight B. Rasuo, V. Jazarevic	On Kolmogorov's two-equation model for turbulence A. Mielke

S15.07 Uncertainty quantification Chair: H. Gottschalk HS 07	S16.05 Nonlinear and mixed-integer optimization Chair: A. Schwartz HS 06	S18.09 Numerical methods of differential equations Chair: I. Perugia HS 31	
Stochastic approximation for PDE constrained optimization under uncertainty C. Geiersbach, G. Pflug	A sequential homotopy method for mathematical programming problems A. Potschka	Finite element approximation of second order PDEs in non-divergence form J. Blechschmidt, R. Herzog, M. Winkler	**14:00**
Variational Monte Carlo - bridging concepts of machine learning and high dimensional partial differential equations M. Eigel, R. Schneider, P. Trunschke, S. Wolf		On the benefits of divergence-conforming (Hybrid) DG FEM for incompressible flows P.L. Lederer, C. Lehrenfeld, G. Lube, J. Schöberl, P.W. Schroeder	**14:20**
Uncertainty quantification for the inflow control in hyperbolic supply systems with uncertain demand S. Göttlich, O. Kolb, K. Lux	A hybrid semismooth-/quasi-Newton method (not only) for structured nonsmooth optimization F. Mannel, A. Rund	The Mass Conserving Mixed Stress (MCS) method for the Stokes equations: recent developments P.L. Lederer, J. Schöberl, J. Gopalakrishnan	**14:40**
Efficient yield optimization of electromagnetic devices M. Fuhrländer, S. Schöps	An approximation scheme for distributionally robust nonlinear optimization J. Milz, M. Ulbrich	A locally weighted least-squares finite element method for the advection-reaction equation S. Muenzenmaier, T. Manteuffel, B. Southworth	**15:00**
Kriging assisted Particle Swarm Optimization for efficient non-intrusive interval analysis N. Le Carrer, D. Moens, M. Faes	Penalty formulations for mixed integer and PDE constrained optimization problems D. Garmatter, M. Stoll	Solving compressible Navier-Stokes equations on simplex space-time meshes M. von Danwitz, V. Karyofylli, N. Hosters, M. Behr	**15:20**
Robust aerodynamic design optimization via primal-dual aggregation method E. Özkaya, N.R. Gauger	Multi-dimensional sum-up rounding P. Manns, C. Kirches	Efficient numerical methods for solving optimal control problems P. Csomós	**15:40**

	S18.10 Numerical methods of differential equations Chair: M. Ohlberger	S19.07 Optimization of differential equations Chair: V. Schulz	S20.07 Dynamics and control Chair: S. Lucia
	SR 08	**HS 30**	**HS 05**
14:00	A phase-field model for fractures in incompressible solids K. Mang, T. Wick, W. Wollner	Optimal medication for tumors modeled by a Cahn-Hilliard-Brinkmann equation P. Knopf, M. Ebenbeck	Extensions of a standard iterative learning control framework and their relevance for a range of applications T. Seel
14:20	Parameter-robust multigrid preconditioner for linear poroelastic media S. Meggendorfer, G. Kanschat	Assimilation of surface current and water level measurements into a 3d barotropic circulation model of the German Bight using a 4DVAR technique J. Schulz-Stellenfleth	
14:40	Stress reconstruction for elasticity problems F. Bertrand, B. Kober, M. Moldenhauer, G. Starke	Arbitrary sensitivity for inverse problems in piezoelectricity B. Jurgelucks, V. Schulze, N. Feldmann, L. Claes	Differences and similarities between reinforcement learning and the classical optimal control framework S. Gottschalk, M. Burger
15:00	Reconstruction-based a-posteriori error estimation in stress-based FEM for frictional contact problems B. Kober, R. Krause, G. Rovi, G. Starke	Numerical identification of motor units in muscles T. Sproll, A. Schiela, M. Lowery	A combined homotopy-optimization approach to parameter identification for dynamical systems K. Schäfer, K. Flaßkamp, J. Fliege, C. Büskens
15:20	Symmetry breaking patterns in the numerical minimization of the elastic energy of thin films G. Papathanassopoulos, S. Bartels	Controlling a crowd with stochastic influence using external agents C. Totzeck	
15:40	Weakly symmetric stress reconstruction and a posteriori error estimation for hyperelasticity F. Bertrand, B. Kober, M. Moldenhauer, G. Starke	Optimization problems for interacting particle systems and corresponding mean-field limits R. Pinnau	

S21.03 Mathematical signal and image processing Chair: C. Kirisits SR 06	S22.07 Scientific computing Chair: J. Saak HS 42		
Mathematical challenges of correspondence problems J. Modersitzki	Tensor decompositions and Monte Carlo: compete or combine? S. Dolgov, K. Anaya-Izquierdo, C. Fox, R. Scheichl		14:00
			14:20
Improved edge detection based on fractional derivatives for real-time measurement systems M. Loderer, M. Beitelschmidt	Application of modern tensor formats to quantum chemistry M. Götte, R. Schneider		14:40
Solving bilinear and quadratic inverse problems using tensorial liftings R. Beinert	Double-grid integration with interpolation-projection (DoGIP): an application to finite element method J. Vondřejc		15:00
Dynamical super-resolution with applications to ultrafast ultrasound imaging F. Romero Hinrichsen, H. Ammari, G. Alberti, T. Wintz	A matrix-free approach for finite-strain hyperelastic problems using geometric multigrid D. Davydov, J. Pelteret, D. Arndt, P. Steinmann		15:20
A clustering algorithm for single-molecule localization in super-resolution microscopy P.G. Schneider, M. Schneider, G. Schütz, C. Heitzinger	Optimal colorings of block smoothers in multigrid methods N. Kintscher, K. Kahl		15:40

	S04.14 **Structural mechanics** Chair: G. Meschke **Audimax**	S06.12 **Material modelling in solid mechanics** Chair: T. Antretter **BIG HS**	S06.13 **Material modelling in solid mechanics** Chair: M. Petersmann **SR 05**
17:40	Soil mechanical influence on numerical goundation design of tower cranes H.W. Müllner, H.R. Meister	Modeling deformation-dependent interface energies by means of phase-field theory H. Lammen, J. Mosler	Modeling the curing process of a polyurethane structural adhesive with regard to the mechanical properties of the cured material R. Jennrich, A. Lion, M. Johlitz, S. Ernst, E. Stammen
18:00	Dealing with stochasticity in seismic safety analysis C. Gasser, C. Bucher	On higher-order interface models T. Heitbreder, J. Mosler	On the singular integro-differential equations related to the adhesive interaction of elastic patch and plate O. Jokhadze, N. Shavlakadze
18:20	A damage detection study of a bridge using bypassing vehicles and computational intelligence D.F. Hesser, F. Bamer, B. Markert	Effect of surface energy anisotropy on diffusion controlled process in polycrystalline materials A.u. Khan, K. Hackl, M. Baitsch	Material modelling of hyperelastic silicone adhesives considering stiffness reduction E. Toups, S. Reese, J. Simon

S07.11 **Coupled problems** Chair: R. Jänicke **HS 21**	S07.12 **Coupled problems** Chair: T. Ricken **SR 07**	S08.08 **Multiscales and homogenization** Chair: D.M. Kochmann **HS 41**	
Determination of material parameters for a multiphasic modeling of hydrogels B. Mau, J. Erfkamp, M. Günther, T. Wallmersperger	Multiphysics modeling and simulation of fluid-saturated porous ferrogels at finite strains P. Gebhart, T. Wallmersperger	A bottom-up continuum approach of crystal plasticity for the analysis of fcc microwires under torsion K. Zoller, K. Schulz	**17:40**
A finite element analysis of a coupled diffusion-deformation theory for elastomeric hydrogels A. Hajikhani, M. Marino, P. Wriggers	A coupled thermo-hydro-mechanical model with double porosity for plant tissues L. Eurich, S. Shahmoradi, A. Wagner, R. Borja, W. Ehlers	Material behavior across scales - grain scale to continuum P. Poorsolhjouy, T. Hochrainer	**18:00**
An overview of simulated hydrogel behaviour under various kinds of stimulation K. Keller, T. Wallmersperger, T. Ricken	Modelling of ice formation and brine flow in Antarctic sea ice in the framework of the extended Theory of Porous Media (eTPM) A. Thom, T. Ricken	Demand-based coupling of the scales in the finite temperature CADD method P. Wurm, M. Ulz	**18:20**

Contributed Sessions

	S08.09 **Multiscales and homogenization** Chair: S. Wulfinghoff	S10.04 **Turbulence and reactive flows** Chair: A. Scholtissek	S15.08 **Uncertainty quantification** Chair: H. Gottschalk
	SR 03	**HS 03**	**HS 07**
17:40	A plaque growth model with fast oscillating forcing F. Sonner	Coherent vortex structure investigation behind the axial fan impeller in pipe D.S. Cantrak, N.Z. Jankovic, M.S. Nedeljkovic	Uncertainty quantification and prediction error meta classification in semantic segmentation with deep neural networks M. Rottmann, P. Colling, T. Hack, F. Hüger, P. Schlicht, H. Gottschalk
18:00	Reduction of round-off errors in chemical reaction systems with different timescales A.A. Lukassen	Reduction of fuel consumption of small gas turbines at idling under combined operation with adjustable compressor inlet and turbine outlet guide vanes U. Borchert	Bayesian multi-scale analysis of mechanical structures B. Rosic, M. Sarfaraz, S.K. Shivanand, A. Reege, H.G. Matthies
18:20	Mechanical properties assessments of as- cast light alloys predicted by a new size-sensitive variant of Differential Effective Medium theory L.R. Parashkevova, L. Drenchev	Numerical approaches for the simulation of the yeast distribution in a fermentation tank D. Klembt, H. Meironke	Causality and Bayesian network PDEs for multiscale representations of porous media E.J. Hall, K. Um, M. Katsoulakis, D. Tartakovsky

S16.06 **Nonsmooth optimization I** Chair: M. Steinbach	S18.11 **Numerical methods of differential equations** Chair: M. Ohlberger	S21.04 **Mathematical signal and image processing** Chair: C. Kirisits	
HS 06	**HS 31**	**SR 06**	
On a new linearization approach for nonsmooth optimization A. Walther, A. Griewank	Mode-based derivation of adjoint equations - a lazy man's approach J. Reiss, M. Lemke, J. Sesterhenn	On the robust PCA and Weiszfeld's algorithm S. Neumayer, M. Nimmer, S. Setzer, G. Steidl	**17:40**
On the relation between MPECs and optimization problems in abs-normal form L.C. Hegerhorst-Schultchen, C. Kirches, M.C. Steinbach	On some discrete boundary value problems for elliptic equations V. Vasilyev, A. Vasilyev, O. Tarasova	Reconstruction of non-stationary signals by the generalized Prony method G. Plonka, K. Stampfer, I. Keller	**18:00**
On the hierarchical structure of Pareto critical sets in multiobjective optimization B. Gebken, S. Peitz, M. Dellnitz			**18:20**

Friday, February 22

08:30	**Contributed Sessions**	
	all lecture rooms	19 parallel sessions
10:30	**Coffee Break**	
	Festsaal, Hof 8	Refreshment including coffee, tea, soft drinks, fruits, and biscuits
11:00	**Plenary Lecture - Mechanics**	
	Audimax	**Peter Betsch** (KIT Karlsruhe) *History and recent developments of energy-momentum schemes* Chaired by Detlef Kuhl
12:00	**Plenary Lecture - Mechanics**	
	Audimax	**Christian Hellmich** (TU Wien) *Towards unified hierarchical modeling of hard and soft biological tissues* Chaired by Josef Eberhardsteiner
13:00	**Closing**	
	Audimax	Local organizer: *Joachim Schöberl* GAMM 2020 organiser: *Detlef Kuhl* GAMM president: *Heike Faßbender*

	S01.05 **Multi-body dynamics** Chair: M. Krommer **HS 16**	S02.08 **Biomechanics** Chair: A.E. Ehret **HS 01**	S03.08 **Damage and fracture mechanics** Chair: S. Wulfinghoff **HS 50**
08:30	On the origin of passive rotation in rotational joints, and how to calculate it S. Du, J. Schlattmann, S. Schulz, A. Seibel	AFM-based microbeam bending of human cortical bone lamellae from the femur midshaft V. Nedelkovski, O.G. Andriotis, R. Hahn, P.H. Mayrhofer, P.J. Thurner	Detection of cracks and notches based on the monitoring of remote strain fields and the distributed dislocation technique R. Boukellif, A. Ricoeur
08:50	On different geometric approaches to the dynamics of finite-dimensional mechanical systems S.R. Eugster, G. Capobianco, T. Winandy	Hierarchical elastoplasticity of bone V. Wittner, C. Morin, C. Hellmich	Noise reduction for DIC measurements and single strut testing M. Reis, S. Diebels, A. Jung
09:10	Kinematics of finite-dimensional mechanical systems on Galilean manifolds T. Winandy, S.R. Eugster, G. Capobianco	NURBS-enriched finite element formulation for frictional contact between bone and implant K. Immel, T.X. Duong, R.A. Sauer, V. Nguyen, G. Haiat	Investigations on biaxial specimens for anisotropic damage evolution in SMC J. Lang, M. Schemmann, T. Seelig, T. Böhlke
09:30	Dynamics of finite-dimensional mechanical systems on Galilean manifolds G. Capobianco, T. Winandy, S.R. Eugster	Towards physiological conditions in total knee arthroplasty by a bionics-inspired tibial implant design B. Eidel, A. Gote, C. Fritzen, A. Ohrndorf, H. Christ	Simulation of subcritical crack propagation in hard metal microstructures D. Wingender, D. Balzani
09:50		An experimental testing workflow for personalized osteosynthesis systems M. Roland, T. Tjardes, M. Reis, B. Bouillon, S. Diebels	
10:10			

S04.15 **Structural mechanics** Chair: M. von Scheven **Audimax**	S06.14 **Material modelling in solid mechanics** Chair: T. Antretter **BIG HS**	S07.13 **Coupled problems** Chair: D. Kuhl **HS 21**	
A first order homogenization approach for structural elements: beam kinematics S. Klarmann, F. Gruttmann, S. Klinkel	Experimental investigation of material parameters from direct laser writing W. Huang	Simulation of thermoelastic problems with the finite element method F. Matter, P. Ziegler, P. Eberhard	**08:30**
Evidences of the non-negligible effects of the orientation of material principal directions on the structural response of a planar anisotropic beam G. Balduzzi, S. Morganti, J. Füssl, M. Aminbaghai, A. Reali, F. Auricchio	Identification of parameters using iterative biparabolic target functions N. Nostitz, N.H. Kröger, J. Ihlemann	Finite-strain thermo-viscoplasticity for case-hardening steels over a wide temperature range P. Oppermann, R. Denzer, A. Menzel	**08:50**
A higher-order shear deformation approach to the mixed-mode buckling problem in composite laminated beams S. Mittelstedt, C. Mittelstedt	Influence of thermal boundary conditions on the parameter identification in thermodynamics L. Rose, A. Menzel	A diffuse-interface model for two-phase flow with thermocapillary effects and phase transitions I. Yashchuk	**09:10**
Nonlinear finite element study of beams with elasto-plastic damage behavior in the post-buckling regime B. Werner, M. Todt, H.E. Pettermann	Parameter identification of strain rate dependent hardening for sheet metals B. Söhngen, K. Willner	Hygro-micromechanical analysis of the interfiber bonding in a fiber-network B. Lin	**09:30**
Extension of Boley's method to two-layer rectangular beams J. Gahleitner, H. Irschik	Towards deep learned constitutive models based on two-dimensional strain fields M. Hillgärtner, K. Linka, M. Itskov	Polymorphic uncertainty quantification of computational soil and earth structure simulations via the variational sensitivity analysis C. Henning, T. Ricken	**09:50**
On a similarity transformation based on a Jordan Decomposition leading to an exact transfer matrix for a composite beam structure with refined Zigzag kinematics K. Nachbagauer, H. Wimmer		Optimization of diffusion driven degradation processes N. Waschinsky, F. Barthold, A. Menzel	**10:10**

	S07.14 Coupled problems Chair: A. Zilian SR 07	S08.10 Multiscales and homogenization Chair: A.D. Tutcuoglu HS 41	S08.11 Multiscales and homogenization Chair: M. Gei SR 03
08:30	A finite-element framework for the modelling and simulation of phase transforming magnetic solids using energy relaxation concepts T. Bartel, B. Kiefer, A. Menzel	Boundary conditions in continuum dislocation dynamics T. Hochrainer	Canonical quasicrystalline metamaterials M. Gei, L. Morini, Z. Chen
08:50	Modeling and simulation of magneto-elastic coupling using FFT-based homogenization methods F. Dietrich, M. Harutyunyan		Local instability driven macroscopic deformations in fibrous networks S. Domaschke, A. Morel, G. Fortunato, A.E. Ehret
09:10	The interplay of particle structure and mechanical properties in NdFeB-loaded magnetorheological elastomers M. Schümann, J. Morich, S. Odenbach	Coupled atomistic-continuum simulation of the mechanical properties of single-layered graphene sheets Q. Zheng, J. Wackerfuß	Maximum-entropy approximants for numerical energy relaxation and associated microstructure formation in problems with non-convex energetic potentials S. Kumar, V. Ananthan, D.M. Kochmann
09:30	Influence of damaged interfaces on poling processes and coupling factors in magnetoelectric composites A. Schlosser, A. Ricoeur	Investigation of the mechanical behavior of polystyrene using molecular dynamics M. Ries, P. Steinmann, S. Pfaller	Innovative characterization and multiscale modeling of dental cement pastes P. Dohnalik, B. Pichler, C. Hellmich
09:50	Nonlinear bilateral caloric-electromechanical couplings in polycrystalline ferroelectrics A. Warkentin, M. Wingen, S. Lange, A. Ricoeur	Modelling atomic scale rearrangements in silica glass under simple shear deformation F. Ebrahem, F. Bamer, B. Markert	A spatiotemporal non-local elastodynamic homogenization for composites L. Wang, J. Xu, J. Wang, B.L. Karihaloo
10:10		FFT-based homogenisation accelerated by low-rank approximations J. Vondřejc, D. Liu, M. Ladecký, H.G. Matthies	

S11.08 Interfacial flows Chair: M. Schmidt HS 02	S12.08 Waves and acoustics Chair: M. Kaltenbacher HS 34	S14.11 Applied analysis Chair: P. Dondl HS 32	
Modeling and simulation of the desalination process using CO2 hydrate J. Ha, C. Rauh, A. Delgado	A mesoscale material model to describe continuous mode conversion of lamb waves in composite materials E. Zimmermann, A. Eremin, R. Lammering	Dynamic perfect plasticity and damage in viscoelastic solids E. Davoli, U. Stefanelli, T. Roubíček	**08:30**
Proceedings in fluiddesign T. Beckmann, P. Reinke, M. Schmidt	Dynamic anisotropy and localisation in relaxed micromorphic continua D. Tallarico, G. Barbagallo, M.V. D'Agostino, A. Aivaliotis, P. Neff, A. Madeo	Coupled advection-reaction-diffusion processes on an evolving microstructure: analysis and homogenization D.M. Wiedemann, M.A. Peter	**08:50**
A CFD model for simulating the electron beam welding of a CrMnNi-steel S. Borrmann, R. Schwarze	Effective description of anisotropic wave dispersion in mechanical band-gap metamaterials via the relaxed micromorphic model A. Madeo	A unified model for stress-driven rearrangement instabilities P. Piovano	**09:10**
	Microstructure-related Stoneley waves and wavefront manipulation at a 2D Cauchy/relaxed micromorphic interface A. Aivaliotis, A. Daouadji, D. Tallarico, M.V. d'Agostino, P. Neff, A. Madeo	Drift-diffusion problems with Gauss-Fermi statistics and field-dependent mobility for organic semiconductor devices A. Glitzky	**09:30**
	Tuning of vibration and wave propagation characteristics in pre-deformed periodic lattice frame structures M. Mellmann, C. Zhang	Weak-strong uniqueness for Navier-Stokes two-phase flow with surface tension S. Hensel, J. Fischer	**09:50**
		Two-speed solutions to non-convex rate-independent systems S. Schwarzacher, F. Rindler, E. Suli, J.J.L. Velázquez	**10:10**

	S15.09 **Uncertainty quantification** Chair: H. Gottschalk **HS 07**	S16.07 **Nonsmooth optimization II** Chair: C. Clason **HS 06**	S17.07 **Applied and numerical linear algebra** Chair: A. Heinlein **Elise-Richter HS**
08:30	Low-rank approximations for fuzzy-stochastic models D. Moser, L. Grasedyck, R. Gruhlke, M. Eigel	Why under certain conditions one-dimensional search for the optimum of a function is really Fibonaccian. H. Niessner	A subspace framework for H-infinity-norm minimization N. Aliyev, P. Benner, E. Mengi, M. Voigt
08:50	Reliability analysis for a polymorphic uncertainty model of heterogeneous materials using a domain decomposition approach T. Lahmer, A. Schmidt, C. Könke	Theory and numerical practice for optimization problems involving l^p functionals, with p in [0,1) D. Ghilli, K. Kunisch	Projected Newton-Kleinman method for the algebraic Riccati equation D. Palitta
09:10	A fuzzy uncertainty model for analytical and numerical homogenization of transversely fiber reinforced plastics I. Caylak, E. Penner, A. Henkes, R. Mahnken	First-order methods and model splitting techniques for non-convex non-smooth optimization T. Valkonen, C. Clason, S. Mazurenko	Efficient preconditioning of hp-FEM matrices by hierarchical low-rank approximations P. Gatto, J.S. Hesthaven
09:30		A primal-dual algorithm for risk minimization T.M. Surowiec, D.P. Kouri	Low rank tensor train methods for isogeometric analysis in PDE-constrained optimization A. Buenger, M. Stoll, S. Dolgov
09:50		Random function iterations for stochastic fixed point problems N. Hermer, R. Luke, A. Sturm	Scalable parallel hierarchical matrices on GPUs P. Zaspel
10:10			The Loewner framework for modeling and analysis of nonlinearities in the context of Generalized Frequency Response Functions D. Karachalios, I.V. Gosea, A.C. Antoulas

S18.12 Numerical methods of differential equations Chair: I. Perugia HS 31	S19.08 Optimization of differential equations Chair: K. Sturm HS 30	S21.05 Mathematical signal and image processing Chair: C. Kirisits SR 06	
Space-time finite and boundary element methods O. Steinbach	Optimal control and asymptotic analysis of the Cattaneo model S. Blauth	Total variation based Lavrentiev regularisation for signal processing M. Grasmair	08:30
	The Cattaneo-Model in the context of thermoablation of liver tumors M. Andres, R. Pinnau	A convex variational model for learning image descriptors from incomplete data A. Chambolle, M. Holler, T. Pock	08:50
Parallel sace-time finite element solvers of parabolic initial-boundary value problems with non-smooth solutions A. Schafelner, U. Langer	Optimal boundary control of hyperbolic balance laws with state constraints J.M. Schmitt, S. Ulbrich	Sparsity of solutions for variational inverse problems with finite-dimensional data K. Bredies, M. Carioni	09:10
Higher-order time stepping for micromagnetism M. Feischl	Optimal control of a critical semilinear wave equation in 3d H. Meinlschmidt, K. Kunisch	Convergent domain decomposition methods for total variation minimization A. Langer	09:30
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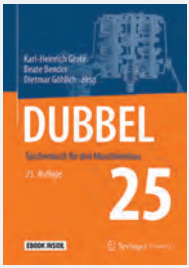

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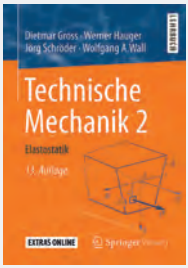

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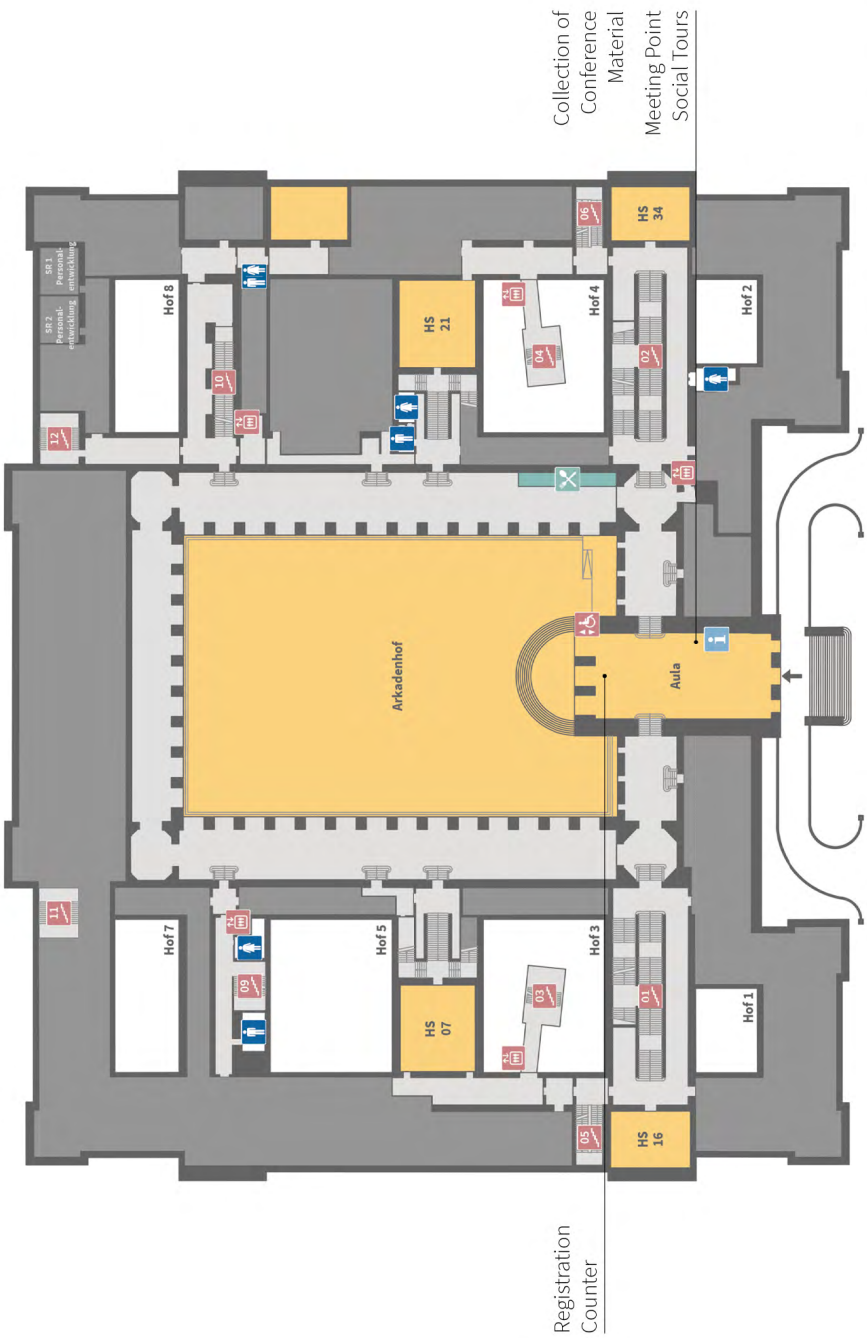


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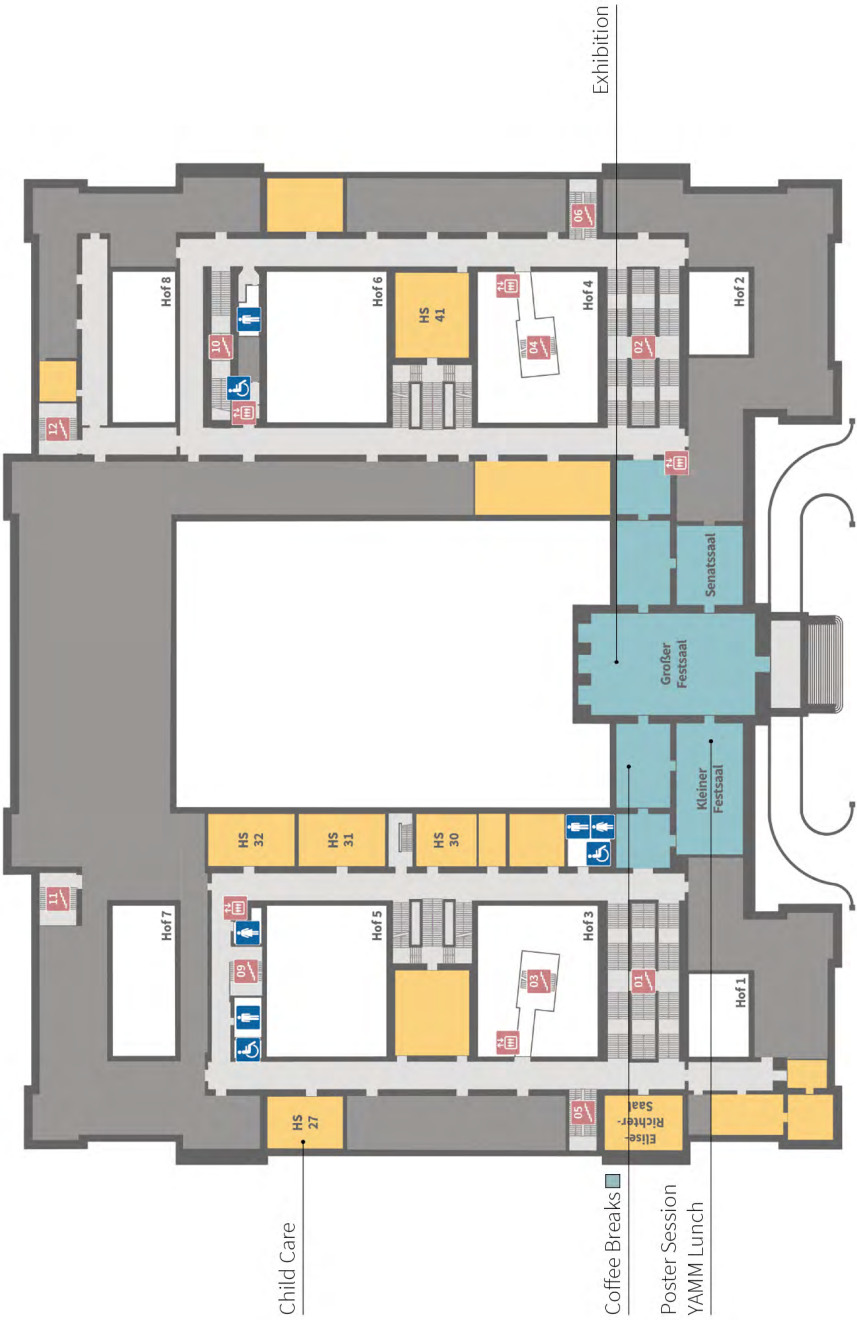

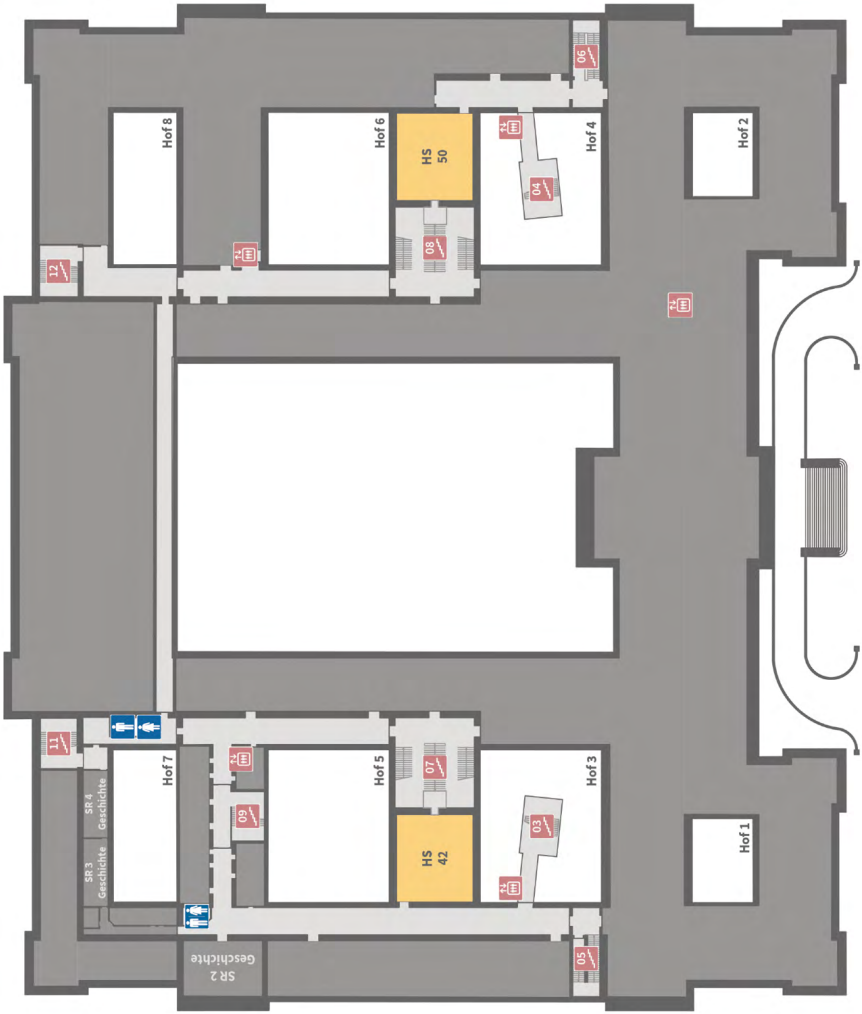

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