10th International Conference on Computational Methods in Applied Mathematics (CMAM-10)

Mon, Jun 10		Tue, Jun 11		Wed, Jun 12		Thu, Jun 13		Fri, Jun 14	
08:30 – 09:10	Registration	8:30 – 10:00	M01 M09 M13 M10	8:30 – 10:00	**S.C. Brenner** **N. Nataraj**	8:30 – 10:00	M04 M03 M02	8:30 – 10:00	M04 M03 M06
09:10 – 09:15	Opening								
09:15 – 10:00	**C. Carstensen**								
10:00 – 10:30	Coffee break	10:00 – 10:30	Coffee break	10:00 – 10:30	Coffee break	10:00 – 10:30	Coffee break	10:00 – 10:30	Coffee break
10:30 – 12:00	M01 M09 M13 M07	10:30 – 12:00	**C. Makridakis** **S.I. Repin**	10:30 – 12:00	M05 M11 M06 M03	10:30 – 12:00	**J. Zou** **E.-J. Park**	10:30 – 12:00	**J. Hu** **D. Praetorius**
12:00 – 13:30	Lunch break	12:00 – 13:30	Lunch break	12:00 – 13:30	Lunch break	12:00 – 13:30	Lunch break	12:00 – 13:30	Closing & Lunch break
13:30 – 15:00	M05 M11 M12 M10	13:30 – 15:00	M01 M09 M02 C	13:30 – 15:00	**U. Langer** **N. Heuer**	13:30 – 15:00	M01 M03 M06 M07		
15:00 – 15:30	Coffee break	15:30 – 16:00	Coffee break	15:30 – 16:00	Coffee break	15:30 – 16:00	Coffee break		
15:30 – 17:00	M05 M11 M12 C	15:30 – 17:00	M04 M03 M08 C	15:30 – 17:30	M14 M09 M06 M07	15:30 – 17:30	M04 M03 M08 M10		
17:15 – 18:00	**D. Boffi**	17:15 – 18:00	**S. Margenov**						
		18:30 – 19:30	CMAM board meeting	19:00 – 22:00	Conference dinner at University Club Bonn				

Funded by the TRA Modelling (University of Bonn) as part of the Excellence Strategy of the federal and state governments and the Hausdorff Center for Mathematics (HCM).

Save the date: CMAM 2026 takes place at TU Vienna from Monday July 20 to Friday July 24, 2026, `http://asc.tuwien.ac.at/cmam2026/`

Conference program

M01: Advances in p- and hp-, and problem oriented Galerkin methods (Théophile Chaumont-Frelet & Lorenzo Mascotto)

M02: Multiscale methods for PDEs (Christian Döding & Roland Maier)

M03: Advancements in computational wave problems and related applications (Lina Zhao, Zhi Zhou & Jun Zou)

M04: Residual minimization methods (Fleurianne Bertrand & Gregor Gantner)

M05: Variational methods for evolutionary PDEs (Gregor Gantner, Sergio Gómez & Johannes Storn)

M06: Recent advances for adaptivity in applications (Bernhard Endtmayer & Henry von Wahl)

M07: Advanced methods for nonlinear PDEs (Philipp Bringmann & Ani Miraci)

M08: Direct or inverse wave propagation problems in complex media (Francesca Bonizzoni & Philip Freese)

M09: Recent developments in numerical PDEs (Susanne C. Brenner & Joscha Gedicke)

M10: Recent advances in numerical methods for non-linear and non-smooth PDEs (Pablo Alexei Gazca-Orozco & Alex Kaltenbach)

M11: Advances in tensor finite element methods (Jun Hu & Rui Ma)

M12: Efficient solution strategies for multiphysics problems (Francisco Gaspar & Iryna Rybak)

M13: Computational UQ for PDEs (Jürgen Dölz & Fernando Henriquez)

M14: Nonstandard FEM, DG, and related methods (Eun-Jae Park & Dongwook Shin)

C: Contributed talks

Monday, June 10, 2024				
08:30 – 09:10	Registration			
09:10 – 09:15	Opening (Wolfgang-Paul-Saal)			
09:15 – 10:00	**Carsten Carstensen**: Computation of plates			Chair: Joscha Gedicke
10:00 – 10:30	Coffee break			
	M01 Wolfgang-Paul-Saal	M09 Schumpeter Raum	M13 Curtius Raum	M07 Martini Raum
	Chair: Lorenzo Mascotto	Chair: Joscha Gedicke	Chair: Jürgen Dölz	Chair: Philipp Bringmann
10:30 – 11:00	**J.M. Melenk** hp-FEM for the integral fractional Laplacian in polygons	**Z. Tan** A finite element method for a two-dimensional Pucci equation	**V. Karnaev** Quantifying domain uncertainty in linear elasticity	**M. Feischl** Adaptive approximation of nonlinear stochastic processes
11:00 – 11:30	**A. Chernov** Analytic and Gevrey class regularity for parametric nonlinear problems	**J. Garay** Hierarchical super-localized orthogonal decomposition methods for the solution of multi-scale elliptic problems	**F. Henriquez** Model order reduction for parametric time-dependent problems using the Laplace transform	**S. Fronzoni** Finite Element Approximation of the Fractional Porous Medium Equation
11:30 – 12:00	**Y. He** Exponential convergence of mixed hp-FEM for the stationary incompressible Navier-Stokes equations with mixed boundary conditions in polygons	**C. Cavanaugh** Hodge decomposition finite element method for the 3D quad-curl problem	**D. Ebert** On uncertainty quantification of eigenpairs with higher multiplicity	**D. Gallistl** A posteriori error control in the max morm for the Monge-Ampère equation
12:00 – 13:30	Lunch break			
	M05 Wolfgang-Paul-Saal	M11 Schumpeter Raum	M12 Curtius Raum	M10 Martini Raum
	Chair: Sergio Gómez	Chair: Jun Hu	Chair: Francisco Gaspar	Chair: Alexei Gazca & Alex Kaltenbach
13:30 – 14:00	**C. Urzúa-Torres** Stable adaptive least-squares space-time BEM for the wave equation	**S. Zhang** A simple finite element scheme for H(div div) interface problem	**P. Gervasio** Modeling fluid filtration in porous media by an overlapping approach	**J. Nick** Numerical analysis for electromagnetic scattering with nonlinear boundary conditions
14:00 – 14:30	**B. Endtmayer** Goal-oriented adaptive space-time finite element methods for regularized parabolic p-Laplace problems	**A. Sky** Between minimal regularity and strong symmetry: Finite elements for the Reissner-Mindlin plate	**I. Rybak** Preconditioners for Stokes-Darcy problems	**Y. Osborne** Analysis and numerical approximation of stationary second-order mean field game partial differential inclusions
14:30 – 15:00	**O. Steinbach** On a modified Hilbert transformation, the discrete inf-sup condition, and error estimates	**Y. Liang** Local bounded commuting projection operators for discrete gradgrad complexes	**G. Birke** Cut-Cell discretizations for hyperbolic conservation laws	**V. Jackisch** Exact error analysis of a linearized harmonic map problem
15:00 – 15:30	Coffee break			
	M05 Wolfgang-Paul-Saal	M11 Schumpeter Raum	M12 Curtius Raum	C Martini Raum
	Chair: Gregor Gantner	Chair: Shuo Zhang	Chair: Iryna Rybak	Chair: Barbara Verfürth

15:30 – 16:00	**L. Mascotto** Space-time virtual elements: a priori error analysis, residual error estimators, and adaptivity	**X. Huang** A new div-div-conforming symmetric tensor finite element space with applications to the biharmonic equation	**C. Riethmüller** Preconditioning strategies for precipitation and dissolution	**Q. Wu** Conditions for splines to admit a finite element construction
16:00 – 16:30	**H. Gimperlein** An a posteriori estimate and space-time adaptive boundary elements for the wave equation	**R. Ma** Finite element divdiv complexes on tetrahedral and cuboid meshes	**F. Gaspar** A decoupled solver for Biot's model	**R. Rosandi** Riemannian shape optimization of thin shells using isogeometric analysis
16:30 – 17:00	**R. Stevenson** A quasi-optimal space-time finite element method for parabolic problems	**T. Lin** Distributional complexes: hessian, divdiv and elasticity	**J. Kraus** Time-continuous strongly conservative space-time finite element methods for the dynamic Biot model	**D. Kolombage** Multiscale methods for elliptic eigenvalue problems with randomly perturbed coefficients
17:15 – 18:00	**Daniele Boffi**: On the stability and convergence of a fictitious domain approach for fluid-structure interaction problems			Chair: Neela Nataraj

Tuesday, June 11, 2024				
	M01 Wolfgang-Paul-Saal Chair: Lorenzo Mascotto	M09 Schumpeter Raum Chair: Joscha Gedicke	M13 Curtius Raum Chair: Fernando Henriquez	M10 Martini Raum Chair: Alexei Gazca & Alex Kaltenbach
08:30 – 09:00	**S. Congreve** Smoothness estimation for hp-refinement of virtual element methods	**C. Merdon** Pressure-robustness in Navier-Stokes finite element simulations	**J. Quizi** The dimension weighted fast multipole method for scattered data approximation	**S. Ko** Analysis and approximation of incompressible chemically reacting generalized Newtonian fluid
09:00 – 09:30	**A. Cangiani** Conforming virtual element method for linear elliptic equations in nondivergence form	**P. Zilk** Approximation of Laplace eigenvalues and eigenfunctions of domains with corners	**R. Aylwin** Multilevel domain uncertainty quantification in computational electromagnetics	**M. Hoferichter** Convergence rate for a space-time discretization for incompressible generalized Newtonian fluids: the Dirichlet problem for $p > 2$
09:30 – 10:00	**M. Vohralík** p-robust global-local equivalence, p-stable local (commuting) projectors, and optimal elementwise hp approximation estimates in H^1 and $\boldsymbol{H}(\mathrm{div})$	**N.-E. Bohne** Optimal pressure convergence for Scott-Vogelius type elements	**T.S. Samrowski** A Posteriori Estimates for a coupled piezoelectric model with uncertain data	**T. Tscherpel** A Nitsche method for fluid flow with set-valued boundary conditions
10:00 – 10:30	Coffee break			
10:30 – 11:15	**Charalambos Makridakis**: Mathematics for machine learning algorithms: a PDE and numerical analysis perspective			Chair: Carsten Carstensen
11:15 – 12:00	**Sergey I. Repin**: Error identities for parabolic and hyperbolic equations with monotone spatial operators			
12:00 – 13:30	Lunch break			
	M01 Wolfgang-Paul-Saal Chair: Lorenzo Mascotto	M09 Schumpeter Raum Chair: Susanne C. Brenner	M02 Curtius Raum Chair: Christian Döding	C Martini Raum Chair: Johannes Storn

13:30 – 14:00	**C. Parker** Polynomial Extension Operators and Applications	**S. Zacharias** An equilibrated a posteriori error estimator for the biharmonic eigenvalue problem	**A. Lozinski** On the regularity assumptions in the analysis of MsFEM	**C. Perinati** A quasi-Trefftz DG method for the diffusion-advection-reaction equation with piecewise-smooth coefficients
14:00 – 14:30	**P.L. Lederer** High-order projection-based upwind method for implicit large eddy simulation	**B. Gräßle** Framework for nonconforming approximations of some semilinear problems	**J. Schleuß** Training and enrichment based on a residual localization strategy	**M. Hecht** Fast multivariate Newton interpolation for downward closed polynomial spaces
14:30 – 15:00	**B. Bammer** An hp-adaptive strategy based on locally predicted error reductions	**L.S. Poensgen** Adaptive virtual element methods for the vibration and buckling of Kirchhoff plates	**M. Khrais** Localized orthogonal decomposition for nonlinear nonmonotone PDEs	**S. Mohapatra** Spectrum analysis using least-squares spectral element approach
15:00 – 15:30	Coffee break			
	M04 Wolfgang-Paul-Saal	M03 Schumpeter Raum	M08 Curtius Raum	C Martini Raum
	Chair: Fleurianne Bertrand	Chair: Jun Zou	Chair: Philip Freese	Chair: Joscha Gedicke
15:30 – 16:00	**O. Steinbach** Adaptive least-squares space-time finite element methods	**C. Ma** A multiscale generalized FEM based on locally optimal spectral approximations for high-frequency wave problems	**E. Parolin** Stability properties of integral and discrete plane wave representations of Helmholtz solutions	**R. Zhang** The PML-method for a scattering problem for a local perturbation of an open periodic waveguide
16:00 – 16:30	**L. Alzaben** Least-squares linear elasticity eigenvalue problem: The two-field formulation and its spectrum operator	**L. Ammann** Sequential quadratic programming for acoustic full waveform inversion	**M. Bonazzoli** Seismic imaging of a dam-rock interface using Full-Waveform Inversion	**A.P. Singh** High-order stable computational algorithm for space-time fractional stochastic nonlinear diffusion wave model
16:30 – 17:00	**M. Feuerle** Model Reduction for the Wave Equation beyond the limitations of the Kolmogorov N-width	**D. Shin** A hybrid discontinuous Galerkin method with stabilizations for linearized Navier-Stokes equations	**S. Sauter** The Green's function for an acoustic half-space problem with impedance boundary conditions	**N. Kishore Kumar** A nonconforming least-squares spectral element method for Stokes interface problems in two dimensions
17:15 – 18:00	**Svetozar Margenov**: Numerical solution of space-fractional parabolic equations			Chair: Sergey I. Repin

Wednesday, June 12, 2024				
08:30 – 09:15	**Susanne C. Brenner**: Finite element methods for least-squares problems			Chair: Norbert Heuer
09:15 – 10:00	**Neela Nataraj**: Nonstandard finite element methods for biharmonic plates and its applications to time dependent problems			
10:00 – 10:30	Coffee break			
	M05 Wolfgang-Paul-Saal	M11 Schumpeter Raum	M06 Curtius Raum	M03 Martini Raum
	Chair: Johannes Storn	Chair: Rui Ma	Chair: Bernhard Endtmayer	Chair: Eric Chung
10:30 – 11:00	**C. Kreuzer** Inf-Sup Theory for the Biot equations: analysis and discretisation	**I. Toulopoulos** Stabilized space-time finite element schemes on anisotropic meshes for linear parabolic equations	**J. Streitberger** Cost-optimal goal-oriented adaptive FEM with nested iterative solvers	**R. Khot** Explicit RK schemes with hybrid high-order method for the first-order formulation of the wave equation

11:00 – 11:30	**N. Beranek** A hybrid mixed variational formulation and discretization for the linear transport equation	**L. Ma** Supercloseness and asymptotic analysis of the Crouzeix-Raviart and enriched Crouzeix-Raviart elements	**A. Schafelner** Parallel multiple goal-oriented adaptive space-time finite element methods for quasi-linear parabolic evolution equations	**S. Ko** Quasi-Monte Carlo finite element approximation of the Navier-Stokes equations with initial data modeled by log-normal random fields
11:30 – 12:00	**N. Margenberg** A space-time multigrid method for space-time finite element discretizations of parabolic and hyperbolic PDEs	**H. Wang** A Nonconforming finite element method for Stokes interface problems on a local anisotropic hybrid mesh	**M.P. Bruchhäuser** Goal-oriented adaptivity techniques for convection-dominated problems	
12:00 – 13:30	Lunch break			
13:30 – 14:15	**Ulrich Langer**: A unified finite element approach to PDE-constrained optimal control problems			Chair: Dirk Praetorius
14:15 – 15:00	**Norbert Heuer**: Hybrid methods and plate bending			
15:00 – 15:30	Coffee break			
	M14 Wolfgang-Paul-Saal Chair: Eun-Jae Park & Dongwook Shin	M09 Schumpeter Raum Chair: Susanne C. Brenner	M06 Curtius Raum Chair: Henry v. Wahl	M07 Martini Raum Chair: Ani Miraçi & Philipp Bringmann
15:30 – 16:00	**Y. Jeon** High order immersed hybridized finite difference method for elliptic interface problems	**C. Pervolianakis** Analysis of a stabilized finite element method scheme for a Chemotaxis system	**F. Bertrand** Stress-based finite element methods for eigenvalue problems	**T. Wihler** Adaptive energy minimization for nonlinear variational PDE
16:00 – 16:30	**M.-Y. Kim** Edgewise iterative scheme	**S. Nayak** Convergence of adaptive Crouzeix-Raviart and Morley FEM for distributed optimal control problems	**K. Petersen** Adaptive finite element methods for the linear elasticity eigenvalue problem	**M. Vohralík** A posteriori error estimates robust with respect to nonlinearities and orthogonal decomposition based on iterative linearization
16:30 – 17:00	**D. Shin** Discontinuous Galerkin methods with Lagrange multipliers for convection-diffusion-reaction problems	**S. Tian** A posteriori error estimates for nonconforming discretizations of singularly perturbed biharmonic operators	**J. Alms** Derivation and simulation of thermoelastic Kirchhoff plates	**A. Rappaport** Adaptive regularization, discretization, and linearization for nonsmooth elliptic PDE
17:00 – 17:30				**A. Schröder** A posteriori error estimates for variational inequalities discretized by higher-order finite elements

Thursday, June 13, 2024				
	M04 Wolfgang-Paul-Saal Chair: Fleurianne Bertrand	M03 Schumpeter Raum Chair: Weifeng Qiu	M02 Curtius Raum Chair: Roland Maier	Martini Raum

08:30 – 09:00	**J. Storn** Solving minimal residual methods in $W^{-1,p'}$ with large exponents p	**D. Wang** Optimal long-time decay rate of numerical solutions for nonlinear time-fractional evolutionary equations	**F. Legoll** Multiscale Finite Element Methods for advection-diffusion problems	
09:00 – 09:30	**P. Bringmann** Scaling-robust built-in a posteriori error estimation for discontinuous least-squares finite element methods	**Y. Shi** Filtered finite difference methods for highly oscillatory semilinear hyperbolic systems	**M. Hauck** Reliable coarse scale approximation of spatial network models	
09:30 – 10:00	**E.-J. Park** Locally conservative staggered least squares method on general meshes	**L. Zhao** A stabilization-free mixed DG method for fluid-structure interaction	**P. Freese** Improving sub-mesoscale resolving ocean simulations	
10:00 – 10:30	Coffee break			
10:30 – 11:15	**Jun Zou**: Two effective numerical methodologies for general inverse problems of PDEs			Chair: Jun Hu
11:15 – 12:00	**Eun-Jae Park**: Adaptive multi-level algorithm for a class of nonlinear problems			
12:00 – 13:30	Lunch break			
	M01 Wolfgang-Paul-Saal Chair: Lorenzo Mascotto	M03 Schumpeter Raum Chair: Lina Zhao	M06 Curtius Raum Chair: Bernhard Endtmayer	M07 Martini Raum Chair: Ani Miraçi
13:30 – 14:00	**A. Rieder** A p-version of convolution quadrature in wave propagation	**Y. Cai** A uniformly accurate method for the Klein-Gordon-Dirac system in the nonrelativistic regime	**N.T. Tran** Guaranteed lower eigenvalue bounds with hybrid high-order methods	**P. Heid** A modified Kačanov iteration scheme for the numerical solution of quasilinear elliptic diffusion equations
14:00 – 14:30	**T. Wihler** Exponential convergence of hp-ILGFEM for semilinear elliptic boundary value problems with monomial reaction	**W. Qiu** Analysis of an interior penalty DG method for the quad-curl problem	**A. Mousavi** A least-squares gradient recovery method for Hamilton-Jacobi-Bellman equation	**K. Mitra** Robust iterative linearization methods and adaptivity for nonlinear elliptic problems
14:30 – 15:00		**S. Gómez** Asymptotic-preserving HDG method for the Westervelt quasilinear wave equation	**A. Hodson** A posteriori error analysis of the virtual element method for quasilinear elliptic PDEs	**H. Normington** A decoupled, convergent and fully linear algorithm for the Landau-Lifshitz-Gilbert equation with magnetoelastic effects
15:00 – 15:30	Coffee break			
	M04 Wolfgang-Paul-Saal Chair: Gregor Gantner	M03 Schumpeter Raum Chair: Jun Zou	M08 Curtius Raum Chair: Philip Freese	M10 Martini Raum Chair: Alexei Gazca & Alex Kaltenbach
15:30 – 16:00	**C. Bacuta** Comparison of variational discretizations for a convection—diffusion problem	**E. Chung** A multiscale method for the wave equations	**R. Maier** Localized implicit time stepping for the wave equation	**P. Heid** An adaptive iterative linearised finite element method for the numerical solution of stationary Bingham fluid flow problems

16:00 – 16:30	**Ö. Türk** Least-squares finite element formulations of Steklov eigenvalue problems	**J. Hu** A hybrid iterative method based on MIONet for PDEs: Theory and numerical examples	**Y. Liang** Guaranteed lower energy bounds for the Gross-Pitaevskii problem using mixed finite elements	**J. Jeßberger** Error estimates for a finite element discretization of generalized Navier—Stokes equations
16:30 – 17:00	**H. Schneider** A posteriori error control for nonlinear least-squares finite element method	**C. Su** Scattering and uniform in time error estimates for splitting method in NLS	**C. Döding** Localized orthogonal decomposition methods for propagating waves in the Gross-Pitaevskii equation	**J. Wichmann** Reaching the equilibrium: Long-term stable numerical schemes for deterministic and stochastic p-Stokes systems
17:00 – 17:30	**H. Monsuur** Solving the unique continuation problem using an improved conditional stability estimate			**R. Masri** Coupled 3D-1D systems: derivation, error analysis, and discontinuous Galerkin methods

Friday, June 14, 2024				
	M04 Wolfgang-Paul-Saal	M03 Schumpeter Raum	M06 Curtius Raum	Martini Raum
	Chair: Gregor Gantner	Chair: Yongyong Cai	Chair: Henry v. Wahl	
08:30 – 09:00			**T. Wick** Space-time goal-oriented error control with model order reduction dual-weighted residuals for incremental POD-based ROM for time-averaged goal functionals	
09:00 – 09:30	**G. Starke** Shape optimization by constrained first-order system least mean approximation	**Y. Feng** Improved uniform error bounds on time-splitting methods for long-time dynamics of the nonlinear Klein-Gordon equation with weak nonlinearity	**A. Freiszlinger** Convergence of adaptive multilevel stochastic Galerkin FEM for parametric PDEs	
09:30 – 10:00	**L. Hetzel** Constrained L^p approximation of shape tensors and its role for the determination of shape gradients	**W. Jiang** High order in time, BGN-based parametric finite element methods for solving geometric flows	**Y. Wang** An hp-adaptive sampling algorithm on dispersion relation reconstruction for 2d photonic crystals	
10:00 – 10:30	Coffee break			
10:30 – 11:15	**Jun Hu**: A construction of C^r conforming finite element spaces in any dimension			Chair: Jun Zhou
11:15 – 12:00	**Dirk Praetorius**: Optimal interplay of adaptive mesh-refinement and iterative solvers for elliptic PDEs			
12:00 – 13:30	Closing & Lunch break			