Jun.-Prof. Dr. Jan Heiland

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Born: January 21, 1983—Friedrichshafen, Germany
Nationality: German
Marital status: married, 2 kids

Current Position

Team Leader at the Max Planck Institute for Dynamics of Complex Technical Systems
Junior Professor at the Otto-von-Guericke University Magdeburg

Areas of Specialization

Dynamical Systems, **Navier-Stokes Equations**, **Robust Control**,
Simulation and data-driven control, optimization, and complexity reduction

Academic Career

2007–2009 Student Employee at Bombardier Transportation, Department *Special Engineering for Aerodynamics and Acoustics*, Berlin
2009–2013 Full-time research assistant at TU Berlin, Department of Mathematics, Berlin
since 2013 Postdoc at MPI Magdeburg, Department *Computational Methods in Systems and Control Theory*, Magdeburg
since 2014 Team leader of the team *Computer Aided Control System Design* at the MPI Magdeburg
since 2018 Jun.Prof. for *Numerical Methods for Descriptor Systems* at the OVGU Magdeburg
2021–2022 Prof. for *Data Driven Design of Dynamical Systems* at FAU Erlangen-Nürnberg

Education

2009 Diploma in technical mathematics, TU Berlin
2014 PhD in mathematics, TU Berlin

Scholarships, Research Stays & Honours

2010–2013 PhD scholarship by *Studienstiftung des dt. Volkes*

2012 Research stay at TUCOROM Poitiers, France, invited by Prof. B. Noack

2014 *Research in Pairs* at *Mathematisches Forschungsinstitut Oberwolfach*

since 2015 Open Access Ambassador of the *Max Planck Society*

since 2015 Research stays at Shanghai University, China, as part of the *Recruitment Program of High-end Foreign Experts*

2017 *DAAD travel award* for visiting the *56th IEEE Conference on Decision and Control* in Melbourne, Australia

2020 Research stay at the DeustoTech Research Center in Bilbao, invited by Prof. E. Zuazua (February&March)

Since 2021 Elected member of the *MaRDI Council*[1] – a panel that develops the guiding principles of the *NFDI* consortium *MaRDI* and oversees the adherence to them.

Service to the Community

Reviewing & Editing

since 2014 Reviewer for Adv. Comp. Math. — *Acta Appl. Math.* — *Automatica* — *Electron. Trans. Numer. Anal.* — Eur. J. Control — IEEE Control Syst. Lett. — IEEE Trans. Automat. Control — J. Optim. Theory. Appl. — *Math. Control Signals Systems* — *SIAM J. Cont. Opt.* — *SIAM J. Sci. Comput.* — *Systems Control Lett.* — *DAE Forum* — and others and several conference proceedings

2019–2020 Guest editor at MDPI *mathematics* for the special issue *Robust Stabilization of Linear and Nonlinear Systems*

since 2021 Editor of the book series *Computational and Applied Mathematics* with the *Logos Verlag Berlin*

since 2022 Editor of the Research Topic *Data-based Model Order Reduction and Reduced Order Modelling of Dynamical Systems* at *Frontiers Applied Mathematics and Statistics*

[1] https://mardi4nfdi.de/consortium/organization

Workshop & Symposia Organization

2015 Organization of a minisymposium on *Numerical Approximation of DAEs and Constrained PDEs with Applications* at the ICIAM 2015 in Beijing, China

2016 Workshop *Modelling, Model Reduction, and Optimization of Flows* in Shanghai, China

2017 Minisymposium *MS 28 – Model reduction methods for simulation and (optimal) control* at the Enumath 2017 in Voss, Norway

2018 Young researcher workshop *Analysis and Numerical Approximation of Constrained Systems* in Sion, Switzerland

2018 Chair of the focus session *Model order reduction and low-rank approximation for nonlinear problems* at the EUCCO2018 in Trier, Germany

2019 Minisymposium MS29 *Low-rank modelling in uncertainty quantificatio*n at the Enumath 2019 in Eegmond aan Zee, The Netherlands

2019 Workshop *Machine Learning and Data-driven Methods for Model Reduction and Control* in Shanghai, China

2021 Minisymposium *Data-driven Methods in Model Reduction and Control* at the SIAM Conference on Control and Its Applications (CT21), Spokane (and virtual), United States

2023 Minisymposium *Data-driven Methods and Control* at the GAMM annual meeting, Dresden, Germany

Academic Self-Governance

since 2018 Assistent member of the faculty board at the faculty for mathematics at the OVGU Magdeburg

since 2019 Member of the *Prüfungsausschuss* of the Bachelor program *Mathematikingenieur/in* at the OVGU Magdeburg

since 2021 Person in charge for *research data management* for the research training group *MathCoRe*

Memberships

since 2011 Member of the *GAMM* and the technical committees *Dynamics and Control*, *Scientific Computing*, and *Numerical Analysis*

1 Third party funding

2017 DAAD – travel grant – 2700 Euro

2016&2019 *Chinesisch-Deutsches Zentrum für Wissenschaftsförderung* – financing of two international workshops – 275500+280450 RMB (about 36700+37400 Euro) for local expenses plus 25500+23800 Euro for international travel

2015,2016, 2018–2020 *Chinese State Admistration of Foreign Experts Affairs* and *International Office of Shanghai University* – funding for travel and research stays – about 15000 Euro per year. For 2020, the funding was approved but not instantiated because of travel bans.

2019 Cooperation with company *HASOMED* on the development of a specific control software – 3 months full funding for a student assistant (3000 Euro) plus license fees for the software (1000 Euro per roll out)

2021 *Nationale Forschungsdateninfrastruktur* Consortium *MaRDI4NFDI* at MPI Magdeburg (Spokesperson M. Hintermüller (WIAS, Berlin), 17 participating institutions, overall budget: 9954430 Euro for 5 years, share of the MPI: 771000 Euro, my role: lead of subproject *T2M4:Description and Design of FAIR CSE workflows* (385500 Euro for 5 years))

2021 Research Training Group *Mathematical Complexity Reduction* at OVGU and MPI Magdeburg (Spokesperson S. Sager (OVGU), 9 principal investigators – overall budget: 5582000 Euro for 4.5 years, my share: funding for two PhD students (3 years each, 75% contract plus travels and overhead = 409680 Euro)).

2021 Grant[2] from the *IFAC Activity Fund* (5000 Euro).

[2] https://sites.ifac-control.org/activityfund/activity-fund-sponsored-projects/october-2021-call/

2 Publications

All articles are original research articles.

Journal Publications

[A22] *Exponential Lag Synchronization of Cohen-Grossberg Neural Networks with Discrete and Distributed Delays on Time Scales*, to appear in *Neural Processing Letters*. (with V. Kumar and P. Benner) arxiv:2209.00401

[A21] *Space and Chaos-Expansion Galerkin POD Low-order Discretization of PDEs for Uncertainty Quantification*, to appear in *Int. J. for Numerical Methods in Engineering* in October 2022. (with P. Benner). arxiv:2009.01055

[A20] *A low-rank solution method for Riccati equations with indefinite quadratic terms*, *Numerical Algorithms*, Vol. 92, 2023. (with P. Benner and S.W.R. Werner) DOI:10.1007/s11075-022-01331-w – arxiv:2111.06516

[A19] *Convolutional Neural Networks for Very Low-dimensional LPV Approximations of Incompressible Navier-Stokes Equations*. Frontiers Applied Mathematics and Statistics, 2022. (with P. Benner and R. Bahmani) DOI:10.3389/fams.2022.879140

[A18] *Robust output-feedback stabilization for incompressible flows using low-dimensional $\mathcal{H}_\infty$-controllers*. Comput. Optim. Appl., Vol. 82, 2022. (with P. Benner and S. Werner) DOI:10.1007/s10589-022-00359-x – arxiv:2103.01608

[A17] *Identification of linear time-invariant systems with Dynamic Mode Decomposition*. MDPI Mathematics, Vol. 10(3), 2022. (with B. Unger) DOI:10.3390/math10030418 – arxiv:2109.06765

[A16] *Classical System Theory Revisited for Turnpike in Standard State Space Systems and Impulse Controllable Descriptor Systems*. SIAM J. Control and Optimization, Vol. 59(5), 2021. (with E. Zuazua) DOI:10.1137/20M1356105 – arxiv:2007.13621

[A15] *Galerkin Trial Spaces and Davison-Maki Methods for the Numerical Solution of Differential Riccati Equations*. Applied Mathematics and Computation, Vol. 410, 2021. (with M. Behr and P. Benner) DOI:10.1016/j.amc.2021.126401 – arxiv:1910.13362

[A14] *Operator inference and physics-based learning of low-dimensional models for incompressible flows*. Electron. Trans. Numer. Anal. 56, 2022. (with P. Benner, P. Goyal, and I. P. Duff) DOI:10.1553/etna_vol56s28 – arxiv:2010.06701

[A13] *Convergence of Coprime Factor Perturbations for Robust Stabilization of Oseen Systems*. AIMS Mathematical Control & Related Fields, 2021.
DOI:10.3934/mcrf.2021043 – arxiv:1911.00983

[A12] *Numerical benchmarking of fluid-rigid body interactions*. Computers & Fluids, Vol. 193, 2019. (with H. von Wahl, T. Richter, C. Lehrenfeld and P. Minakowski)
DOI:10.1016/j.compfluid.2019.104290 – arxiv:1908.04637

[A11] *Solution Formulas for Differential Sylvester and Lyapunov Equations*. Calcolo, Vol 56, 2019 (with M. Behr and P. Benner)
DOI:10.1007/s10092-019-0348-x (Open Access) – arxiv:1811.08327

[A10] *Space-Time Galerkin POD with application in optimal control of semi-linear parabolic partial differential equations*. SIAM Journal on Scientific Computing, Vol. 40(3), pp. A1611–A1641, 2018. (with P. Benner and M. Baumann)
DOI:10.1137/17M1135281 – arxiv:1611.04050

[A9] *Regularization and Rothe Discretization of Semi-Explicit Operator DAEs*. International Journal of Numerical Analysis and Modeling, Vol. 15(3), pp. 452–477, 2018. (with R. Altmann)
www.math.ualberta.ca/ijnam/Volume-15-2018/No-3-18/2018-03-08.pdf (Open Access)

[A8] *Exponential Stability and Stabilization of Extended Linearizations via Continuous Updates of Riccati Based Feedback*. International Journal of Robust and Nonlinear Control, Vol. 28, pp. 1218–1232, 2018. (with P. Benner)
DOI:10.1002/rnc.3949 – arxiv:1607.08441

[A7] *Optimal Control of a Stefan Problem Fully Coupled with Incompressible Navier-Stokes-Equations and Mesh Movement*. Analele Stiintifice ale Universitatii Ovidius Constanta - Seria Matematica, 26(2), 11–40, 2018. (with B. Baran, P. Benner, J. Saak)
DOI:10.2478/auom-2018-0016 (Open Access)

[A6] *Moment-Matching Based Model Reduction for Navier–Stokes Type Quadratic-Bilinear Descriptor Systems*. ZAMM - Journal of Applied Mathematics and Mechanics, Vol. 97(10), pp. 1252–1567, 2017. (with M. I. Ahmad, P. Benner, and P. Goyal)
DOI:10.1002/zamm.201500262 –
www2.mpi-magdeburg.mpg.de/preprints/2015/MPIMD15-18.pdf

[A5] *Simulation of Multibody Systems with Servo Constraints through Optimal Control*. Multibody System Dynamics, Vol. 40(1), pp. 75–98, 2017. (with R. Altmann)
DOI:10.1007/s11044-016-9558-z – publications.mfo.de/handle/mfo/1105

[A4] *A Differential-Algebraic Riccati Equation for Applications in Flow Control*. SIAM Journal on Control and Optimization, Vol. 54(2), pp. 718–739, 2016.
DOI:10.1137/17M1135281 – hdl.handle.net/11858/00-001M-0000-002A-1EE0-3

[A3] *Finite Element Decomposition and Minimal Extension for Flow Equations*. M2AN - Mathematical Modelling and Numerical Analysis, Vol. 49(5), pp. 1489–1509, 2015. (with R. Altmann)
DOI:10.1051/m2an/2015029 – hdl.handle.net/21.11116/0000-0001-5E76-2

[A2] *Time-dependent Dirichlet Conditions in Finite Element Discretizations*. ScienceOpen Research, 2015. (with P. Benner)
DOI:10.14293/S2199-1006.1.SOR-MATH.AV2JW3.v1 (Open Access)

[A1] *Distributed Control of Linearized Navier–Stokes Equations via Discretized Input/Output Maps*. ZAMM - Journal of Applied Mathematics and Mechanics. Vol. 92(4), pp. 257–274, 2012. (with V. Mehrmann) DOI:10.1002/zamm.201100069 – www3.math.tu-berlin.de/preprints/files/HeiM11_ppt.pdf

Under Review

[a5] *Convolutional Autoencoders, Clustering and POD for Low-dimensional Parametrization of Navier-Stokes Equations*, submitted to *Computer Methods in Applied Mechanics and Engineering* in February 2023. (with Y. Kim) arxiv:2302.01278

[a4] *Projective Lag Quasi-Synchronization of Coupled Systems with Mixed Delays and Parameter Mismatch: A Unified Theory*, submitted to *IEEE Transactions on Network Science and Engineering* in January 2023. (with V. Kumar and P. Benner)

[a3] *Sequential Convex Optimization with Adaptive Feasible Sets for Fixed-order Dynamic Output Feedback Control*, submitted to *IEEE Transactions on Automatic Control* in December 2022. (with Y.Y. Ren and D.W. Ding)

[a2] *Smoothing Gradient Method for Group-Structured Sparse Feedback Stabilization*, submitted to *International Journal of Robust and Nonlinear Control* in January 2023 (with A. Tang, G. Hu)

[a1] *Exponential Synchronization of BAM Neural Networks with Delay on Arbitrary Time Domain*, submitted to *IEEE Transactions on Neural Networks and Learning Systems* in March 2022 (with V. Kumar and P. Benner)

Peer-reviewed Conference Proceedings and Book Chapters

[B15] *A quadratic decoder approach to nonintrusive reduced-order modeling of nonlinear dynamical systems*, to appear in *Proceedings in Applied Mathematics and Mechanics*. (with P. Benner, P. Goyal, and I. Pontes) arxiv:2209.15412.

[B14] *Convolutional Auto Encoders and Clustering for Low-dimensional Parametrization of Incompressible Flows*, IFAC-PapersOnLine 55(30), pp. 430–435, 2022. (with Y. Kim) DOI:10.1016/j.ifacol.2022.11.091 (Open Access)

[B13] *Non-intrusive Time Galerkin POD for Optimal Control of a Fixed-Bed Reactor for CO_2 Methanation*. IFAC-PapersOnLine 54(3), pp. 122–127, 2021. (with J. Bremer, P. Benner, and K. Sundmacher) DOI:10.1016/j.ifacol.2021.08.229 (Open Access)

[B12] *Equivalence of Riccati-based Robust Controller Design for Index-1 Descriptor Systems and Standard Plants with Feedthrough* European Control Conference (ECC), pp. 402–407, 2020. (with P. Benner)
ieeexplore.ieee.org/document/9143771 –
www.janheiland.de/publication/ben-h-20/ben-h-20.pdf

[B11] *PD Controllers to Solve Single-input, Index-1 DAE based LQR Problems* European Control Conference (ECC), pp. 1795–1800, 2020. (with P. Benner and C. Bhawal)
ieeexplore.ieee.org/document/9143633 –
www.janheiland.de/publication/ben-h-20/bha-hb-20.pdf

[B10] *Continuous, Semi-discrete, and Fully Discretised Navier-Stokes Equations*. In DAE Forum Volume *Applications of Differential-Algebraic Equations: Examples and Benchmarks*, pp. 277–312, 2019. (with R. Altmann)
DOI:10.1007/11221_2018_2 – arxiv:1901.04002

[B9] *Frequency-selective Filter Based Frequency Separated Feedback Control of Linear Systems: State Feedback Case*. 2019 Chinese Control Conference (CCC), pp. 191–196. (with D. Xin, Y. Yang, and K. Okyay)
DOI:10.23919/ChiCC.2019.8865706

[B8] *Robust Controller versus Numerical Model Uncertainties for Stabilization of Navier-Stokes Equations*. IFAC-PapersOnLine 52(2), pp. 25–29, 2019. (with P. Benner and S. Werner)
DOI:10.1016/j.ifacol.2019.08.005 (Open Access)

[B7] *Nonlinear Stabilizing Feedback Design for Incompressible Flows via Updated Riccati-Based Gains*. Proceedings of the 56th IEEE Conference on Decision and Control, CDC 2017, pp. 1163–1168. (with P. Benner)
DOI:10.1109/CDC.2017.8263813 –
www.janheiland.de/publication/ben-h-17-b/ben-h-17-b.pdf

[B6] *Convergence of Approximations to Riccati-based Boundary-feedback Stabilization of Laminar Flows*. IFAC-PapersOnLine 50(1), pp. 12296–12300, 2017. (with P. Benner)
DOI:10.1016/j.ifacol.2017.08.2476 (Open Access)

[B5] *Robust Stabilization of Laminar Flows in Varying Flow Regimes*. IFAC-PapersOnLine, IFAC. Vol. 49(8), pp. 31–36, 2016. (with P. Benner)
DOI:10.1016/j.ifacol.2016.07.414 (Open Access)

[B4] *Discrete Input/Output Maps and their Relation to Proper Orthogonal Decomposition*. Numerical Algebra, Matrix Theory, Differential-Algebraic Equations and Control Theory. Festschrift in Honor of Volker Mehrmann. Springer, pp. 585–608, 2015. (with M. Baumann and M. Schmidt)
DOI:10.1007/978-3-319-15260-8_21 –
www.janheiland.de/publication/bau-hs-15/bau-hs-15.pdf

[B3] *LQG-Balanced Truncation Low-Order Controller for Stabilization of Laminar Flows*. Active Flow and Combustion Control 2014, Springer. pp. 365–379. (with P. Benner)
DOI:10.1007/978-3-319-11967-0_22 –
cscproxy.mpi-magdeburg.mpg.de/preprints/2014/MPIMD14-04.pdf

[B2] *Systematic Discretization of Input/Output Maps and Control of Partial Differential Equations*. Mathematical Methods, Models and Algorithms in Science and Technology, World Scientific, 2010. (with V. Mehrmann and M. Schmidt)
DOI:10.1142/8063 – www3.math.tu-berlin.de/preprints/files/HeiMS10b_ppt.pdf

[B1] *A new discretization framework for input/output maps and its application to flow control*. Active Flow Control. Papers contributed to the Conference, Springer, pp. 357–372, 2010. (with V. Mehrmann and M. Schmidt)
DOI:10.1007/978-3-642-11735-0_23 –
www3.math.tu-berlin.de/preprints/files/HeiMS09_ppt.pdf

Proceedings, Posters, and Selected Preprints

[P6] *Example Setups of Navier–Stokes Equations with Control and Observation: Spatial Discretization and Representation via Linear-quadratic Matrix Coefficients*. 2017. (with M. Behr and P. Benner)
arxiv:1707.08711

[P5] *Best Practices for Replicability, Reproducibility and Reusability of Computer-Based Experiments Exemplified by Model Reduction Software*. AIMS Mathematics Vol. 1(3), 2016. (with J. Fehr, C. Himpe, and J. Saak)
DOI:10.3934/Math.2016.3.261 (Open Access) - arxiv:1607.01191

[P4] *Wie steuert man einen Kran?*. Snapshots of modern mathematics from Oberwolfach, 2015. (with R. Altmann)
publications.mfo.de/handle/mfo/462

[P3] *A generalized POD space-time Galerkin scheme for parameter dependent dynamical systems*. Poster at MoRePaS 2015 - Model Reduction of Parametrized Systems III, Trieste, Italy. (with M. Baumann and P. Benner)
DOI:10.14293/P2199-8442.1.SOP-MATH.P8ECXQ.v1 (Open Access)

[P2] *Simulation and Control of Drop Size Distributions in Stirred Liquid/Liquid Systems*. Proc. 4th International Conference on Population Balance Modelling, September 15-17 2010, Berlin. (with M. Baumann, A. Walle, V. Mehrmann, and M. Schäfer)
Poster – Proceeding – www3.math.tu-berlin.de/numerik/NumMat/DFGProjekte/Drocon

[P1] *Shape Optimization in Train Aerodynamics*. Proceedings of Euromech Colloquium 509 Vehicle Dynamics, Berlin, 2009. (with A. Herbst, J. Mauss, and A. Orellano)
DOI:10.14279/depositonce-2169 (Open Access)

Theses

[T2] PhD thesis – *Decoupling and optimization of differential-algebraic equations with application in flow control*. TU Berlin, 2014.
DOI:10.14279/depositonce-4069 (Open Access)

[T1] Diploma thesis – *Distributed Control of Semidiscretized Oseen Equations*. TU Berlin, 2009. www.janheiland.de/publication/hei-09/hei-09.pdf

Publication of Code

[C6] `Numerical benchmarking of fluid-rigid body interactions`. The raw simulation data and the complete code of a benchmark case for a fluid-structure interaction case in two and three dimensions. 2019. (with H. v. Wahl, T. Richter, P. Minakowski, C. Lehrenfeld)
DOI:10.5281/zenodo.3253455 – Preprint: arxiv:1908.04637v2

[C5] `nse-quadform-mats`. Data and example code for pure *Python/Octave/Matlab* implementations of example setups of distributed or boundary control of incompressible flows. 2017.
DOI:10.5281/zenodo.834940 – Preprint: arxiv:1707.08711

[C4] `spacetime-genpod-burgers`. A *Python* implementation of a generalized space-time POD method with application to optimal control of the Burgers' equation. 2017.
DOI:10.5281/zenodo.583296 – Preprint: arxiv:1611.04050

[C3] `NSE-DAE-Riccati`. A *Python* implementation of an index-2 differential Riccati equation solver for the solution of large-scale tracking problems for Navier-Stokes equations. 2016.
DOI:10.5281/zenodo.192348 – pip:sadptprj-riclyap-adi
Postprint: hdl.handle.net/11858/00-001M-0000-002A-1EE0-3

[C2] `lqgbt-oseen`. A *Python* implementation of the LQGBT approach and related methods for the design of low-dimensional controllers for the stabilization of incompressible flows. Application example: Stabilization of the cylinder wake. 2015.
github.com/highlando/lqgbt-oseen –
Preprint: cscproxy.mpi-magdeburg.mpg.de/preprints/2014/MPIMD14-04.pdf

[C1] `dolfin-navier-scipy`. A *Python* interface between *FEniCS* for Finite Element discretizations of flow equations and *Scipy* for time integration, model reduction, or control algorithms. 2014.
DOI:10.5281/zenodo.3238622 – pip:dolfin-navier-scipy –
github.org/highlando/dolfin_navier_scipy

3 Selected Talks (since 2018)

2023-05-26 *Low-dimensional LPV approximations for large-scale nonlinear controller design*. Conference on *Nonlinear Model Reduction for Control* at Virginia Tech, Blacksburg, USA. personal.math.vt.edu/borggajt/nlromc/index.html (keynote talk)

2023-01-16 *Numerical Methods in Control and Optimization of Dynamical Systems*. *BIMoS Day* at TU Berlin. www.tu.berlin/bimos – www.janheiland.de/event/23-bimos/ (extended seminar talk/tutorial)

2022-06-07 *Data-driven identification of encoding on quadratic-manifolds for high-fidelity dynamical models*. ECCOMAS Congress, Oslo, Norway. www.eccomas2022.org/frontal/ProgSesion.asp?id=155 www.janheiland.de/22-quadmf-opi

2021-08-07 *Convolutional autoencoders for low-dimensional parameterizations of Navier-Stokes flow*. Virtual IFAC Seminar *Data-driven Methods in Control*. https://ie3.etit.tu-dortmund.de/details/ifac-seminar-10080/ (Seminar Talk)

2021-01-19 *Space and Chaos-Expansion Galerkin POD for UQ of PDEs with Random Parameters*. GAMM Fachausschuss *Computational Science and Engineering* Workshop (virtual) www.mb.uni-siegen.de/nm/workshops/gamm-cse-2021/programme.html?lang=de (Seminar Talk)

2020-10-08 *Control of a Triple Pendulum in Theory and Practice*. Musen Seminar Series. Musen Center at TU Braunschweig (virtual) www.tu-braunschweig.de/musen/ws2020 (Seminar Talk)

2020-07-01 *Mathematical Modeling of Infectious Disease*. MathCoRe Seminar. OvGU Magdeburg www.mathcore.ovgu.de/index.php?show=teaching_seminars&year=2020&term=sose (Seminar Talk)

2020-05-13 *Equivalence of Riccati-Based Robust Controller Design for Index-1 Descriptor Systems and Standard Plants with Feedthrough*. European Control Conference - ECC2020, Saint Petersburg, Russia (virtual). https://youtu.be/CLE6uDpq5pE?t=8328. (Contributed Talk)

2020-02-25 *Turnpike in linear systems theory*. Math Encounter at CCM at Deusto University, Bilbao, Spain. https://cmc.deusto.eus/events-calendar/math-encounter/

2019-11-21 *A benchmark for fluid rigid body interaction with standard CFD packages*. GAMM CSE Workshop, Günzburg. www.uni-ulm.de/mawi/institut-fuer-numerische-mathematik/forschung/gamm-cse-workshop-2019/

2019-11-04 *Uncertainties in Oseen Linearizations as Smooth Coprime Factor Perturbations*. LIA COPDESC and Lions Magenes Days, Paris, France. https://liacopdesclm.sciencesconf.org/program (**Invited Talk**)

2019-10-17 *Multidimensional Galerkin-POD for Optimal Control of PDEs with Uncertainties*. Workshop on Machine learning and data-driven methods for model reduction and control. Shanghai, China. www.mpi-magdeburg.mpg.de/shanghaiws19. (Contributed Talk)

2019-10-02 *Stability Analysis of Time Stepping Schemes for Incompressible Flows from a DAE Perspective*. Enumath, Eegmond an Zee, The Netherlands. www.enumath2019.eu/program/show_slot/103 (Contributed Talk)

2019-07-18 *Tensor-space Galerkin POD for parametric flow equations*. ICIAM, Valencia, Spain. https://iciam2019.com/programa/sesiones.html?codSes=MS%20FT-2-4%208 (Contributed Talk)

2019-07-17 *Robust observer-based feedback for the incompressible Navier-Stokes equation*. ICIAM, Valencia, Spain. https://iciam2019.com/programa/sesiones.html?codSes=MS%20ME-1-4%207 (Contributed Talk)

2019-07-03 *Robust control for compensation of linearization and discretization errors in stabilization of incompressible flows*. Seminar am Lehrstuhl für Mathematik mit Schwerpunkt Dynamische Systeme, Passau. https://www.fim.uni-passau.de/dynamische-systeme/gaeste/. (Seminar Talk)

2019-03-19 *Robust Control for Incompressible Fluid Flow*. Descriptor, Paderborn. www.mpi-magdeburg.mpg.de/descriptor2019. (Contributed Talk)

2018-10-18 *Stability Analysis of Semi-Explicit Time Stepping Schemes for Index-2 DAEs*. Seminar of the Math Department of the Shanghai Normal University, Shanghai. (Seminar Talk)

2018-06-02 *Stable Time-integration of Incompressible Navier-Stokes Equations*. NOKO, Braunschweig. https://www.tu-braunschweig.de/inum/noko2018/schedule (Contributed Talk)

2018-05-07 *Open Access, the DEAL, and many ways to scientific content*. *tools seminar* of the SIAM Student Chapter at TU Berlin. www.studentchapterberlin.de/2018/05/07/toolsseminar-open-access-the-deal-and-many-ways-to-scientific-content/ (Seminar Talk)

2018-03-22 *Nonlinear Feedback Design for the Stabilization of Incompressible Flows via Updated Riccati-based Gains*. GAMM, München. jahrestagung.gamm-ev.de/index.php/2018/2018-scientific-program/2018-timetable (Contributed Talk)