

## Prof. Dr. Miriam Mehl

Universität Stuttgart  
Fakultät für Informatik und Elektrotechnik  
Institute for Parallel and Distributed Systems (IPVS),  
Chair Simulation of Large Systems (SGS)

Universitätsstraße 38  
70569 Stuttgart

Germany

Email: [miriam.mehl@ipvs.uni-stuttgart.de](mailto:miriam.mehl@ipvs.uni-stuttgart.de)

Web: <http://www.ipvs.uni-stuttgart.de/abteilungen/sgs>

Phone: +49 711 685 685 88465

Born on March 29, 1974 in Munich (Germany)



### Scientific Career

- Since 2013 W3-Professor at the Institute for Parallel and Distributed Systems (IPVS, Computer Science and Electrical Engineering), University of Stuttgart, Germany, Head of the Chair "Simulation of Large Systems"
- 2012 - 2013 W2-Professor at the Chair for Numerical Mathematics (Department of Mathematics) at the Technische Universität München, Germany
- 2010 - 2012 Akademische Oberrätin at the Chair "Scientific Computing in Computer Science" (Department of Computer Science), Technische Universität München, Germany
- 2010 Habilitation in Computer Science
- 2004 - 2010 Akademische Rätin at the Chair "Scientific Computing in Computer Science" (Department of Computer Science), Technische Universität München, Germany
- 2002 - 2004 Postdoc at the Chair "Scientific Computing in Computer Science" (Department of Computer Science), Technische Universität München, Germany
- 2003 Birth of son Benjamin
- 2001 Birth of son Maximilian
- 2001 Dr. rer. nat. in Computer Science, Technische Universität München
- 1997 - 2001 Doctoral Student at the Chair "Scientific Computing in Computer Science" (Department of Computer Science), Technische Universität München, Germany
- 1993 - 1997 Study of Mathematics (minor Economics) at the Technische Universität München, Germany

### Scholarships, Awards and Faculty Functions

- 2010 - 2013 Carl-von-Linde Junior Fellowship in the focus group "High Performance Computing – Tackling the Multichallenge" at the Institute for Advanced Study (IAS) of the Technische Universität München, Germany
- 1993 - 1997 Bayerische Begabtenförderung (scholarship for highly gifted students of the Bavarian state government)

## Ten most important publications

\* Publications jointly together with UoA-researchers involved within this IRTG

§ Publications jointly together with USTUTT-researchers involved within this IRTG

### A) Published in publication outlets with scientific quality assurance and book publications:

1. Benk, J.; Bungartz, H.-J.; Mehl, M.; Ulbrich, M.: Immersed Boundary Methods for Fluid-Structure Interaction and Shape Optimization within an FEM-Based PDE Toolbox. Chapter in Advanced Computing, Lecture Notes in Computational Science and Engineering, (93), p. 25-56, 2013.
2. Neumann P.; Bungartz, H.-J.; Mehl, M.; Neckel T.; Weinzierl, T.: Coupled Approaches for Fluid Dynamic Problems Using the PDE Framework Peano. Commun. Comput. Phys., 12(1), p. 65-84, 2012.
3. Weinzierl T.; Mehl, M.: Peano - A Traversal and Storage Scheme for Octree-Like Adaptive Cartesian Multiscale Grids. SIAM Journal on Scientific Computing, 33(5), p. 2732-2760, 2011.
4. Bungartz, H.-J.; Gatzhammer. B.; Lieb, M.; Mehl, M.; Neckel, T.: Towards Multi-Phase Flow Simulations in the PDE Framework Peano. Computational Mechanics, 48(3), p. 365-376, 2011.
5. Bader, M.; Mehl, M.; Rude, U.; Wellein, G.: Simulation Software for Supercomputers. Journal of Computational Science, 2(2), P. 93-94, 2011.
6. Mehl, M.; Neckel, T.; Neumann, P.: Navier-Stokes and Lattice-Boltzmann on octree-like grids in the Peano framework. Int. J. Numer. Meth. Fluids, 65(1), p. 67-86, 2010.
7. Atanasov, A.; Bungartz, H.-J.; Frisch, J.; Mehl, M.; Mundani R.-P.; Rank, E.; van Treenk, C.: Book chapter in Computational Steering of Complex Flow Simulations, High Performance Computing in Science and Engineering, p. 63-74, 2010.
8. Uekermann, B.; Cajas, J.C.; Gatzhammer, B.; Houzeaux, G.; Mehl, M.; Vazquez, M.: Towards Partitioned Fluid-Structure Interaction on Massively Parallel Systems. In Proceedings of WCCM XI / ECCM V / ECFD VI, 12 pages, 2014.
9. Neckel, T.; Mehl, M.; Zenger, C.: Enhanced Divergence-Free Elements for Efficient Incompressible Flow Simulations in the PDE Framework Peano. In Proceedings of the Fifth European Conference on Computational Fluid Dynamics, ECCOMAS CFD 2010, 12 pages, 2010.
10. Uekermann, B.; Bungartz, H.-J.; Gatzhammer, B.; Mehl, M.: A Parallel, Black-Box Coupling for Fluid-Structure Interaction. Computational Methods for Coupled Problems in Science and Engineering (Eds: Idelsohn, Papadrakakis, Schrefler), Coupled Problems 2013, 12 pages, 2013.

### B) Other publications

### C) Patents

Supervised graduate students since graduation year 2011

No.	Last Name, First Name	Degree	Title of the dissertation	Duration of thesis
1	Benk, Janos	Dr. rer. nat.	Immersed Boundary Methods within a PDE Toolbox on Distributed Memory Systems	2008 - 2012
2	Weinzierl, Marion	Dr. rer. nat.	Hybrid Geometric-Algebraic Matrix-Free Multigrid on Spacetrees	2009 - 2013

3	Neumann, Philipp	Dr. rer. nat.	Hybrid Multiscale Simulation Approaches for Micro- and Nanoflows	2009 - 2013
4	Lieb, Michael	Dr. rer. nat.	Efficient Simulation of Flows Through Complex Geometries in the PDE Framework Peano	2010 - 2014
5	Gatzhammer, Bernhard	Dr. rer. nat.	Efficient and Flexible Partitioned Simulation of Fluid-Structure Interactions	2010 - 2014
6	Uekermann, Benjamin	Dr. rer. nat.	Simulation of Fluid-Structure Interactions on Massively Parallel Systems	2012 -
7	Bakhtari Arash	Dr. rer. nat.	Efficient Parallel Simulation of Transport in Blood Flow	2013 -
8	Lindner, Florian	Dr. rer. nat.	Coupling of Fluid-, Structure-, and Acoustic-Simulation and its Scalable Parallel Realization	2014 -
9	Lahnert, Michael	Dr. rer. nat.	Adaptive Grid Implementation for Parallel Continuum-Mechanical Methods in Particle Simulations	2014 -

#### Most important research grants since 2011

No.	Research Project	Funding Period	Name(s) of the principal investigator(s)	Funding source and reference number
1	ExaFSA - Exascale Simulation of Fluid-Structure-Acoustics Interactions	01/2012 - 01/2015	Mehl, M.	DFG - Priority Program 1648 - Software for Exascale Computing
2	IAS Focus Group "HPC – Tackling the Multi-Challenge"	05/2010 -	Bungartz, H.-J. Mehl, M. Hegland, M. Biros, G.	Excellence initiative, third funding line (TU München)
3	A High-End Toolbox for Simulation and Optimisation of Multi-Physics PDE Models	11/2008 - 10/2012	Ulbrich, M., Bungartz H.-J. Mehl, M.	Research support "Bayern exzellent"
4	Distributed stochastic simulation for the hydroelastic analysis of very large floating structures	2008 - 2011	Mundani, R.-P. Rank, E. Bunfartz, H.-J. Mehl, M.	Excellence initiative - International Graduate School for Science and Engineering (IGSSE, TUM)