

Curriculum Vitae Olaf Schenk

Full Professor of Computational Science, Università della Svizzera italiana, July 2016

Education

- 2010 **Habilitation in Applied Informatics and Scientific Computing** **University of Basel**
“Venia Docendi” at Department of Mathematics and Computer Science **Basel, Switzerland**
- 1996–2000 **PhD in Electrical Engineering and Information Technology (Dr. sc. techn.)** **ETH Zurich**
Committee members: Wolfgang Fichtner, Martin Gutknecht **Zurich, Switzerland**
- 1990–1995 **Diploma Technomathematik (Computational Mathematics)** **KIT Karlsruhe**
Grade: sehr gut (very good) **Karlsruher Institute of Technology, Karlsruhe, Germany**

Research Interests

My interests are centered around the topic of multicore and manycore algorithms for computational science simulations on emerging high-performance computing (HPC) architectures. To this end, the research connects several relevant subfields of computer science with the needs of computational science and HPC. Typically, I drive research towards extreme-scale simulations in computational algorithms, application software, programming, and software tools. I am currently involved in several HPC and computational science research and simulation projects that develop methods and applications targeted at the next generation of petaflop/exaflop architectures.

Awards and Honors

- 2014 **INCITE Award** **Oak Ridge Leadership Computing Facility, USA**
“[...] for researchers to make transformational advances in science and technology through large allocations of computer time and [...] at the Argonne and Oak Ridge Leadership Computing Facility centers, operated by the US Department of Energy Office of Science.”, 100,000,000 CPU h. (with J. Tromp, Princeton, USA)
- 2013 **INCITE Award** **Oak Ridge Leadership Computing Facility, USA**
“[...] for researchers to make transformational advances in science and technology through large allocations of computer time and [...] at the Argonne and Oak Ridge Leadership Computing Facility centers, operated by the US Department of Energy Office of Science.”, 100,000,000 CPU h. (with J. Tromp, Princeton, USA)
- 2008 **SIAM SIGEST Honor** **Philadelphia, USA**
“SIGEST highlights a recent paper from one of SIAM’s specialized research journals, chosen on the basis of exceptional interest to the entire SIAM community and revised and condensed as needed for greater accessibility.” (with M. Bollhöfer, Braunschweig University of Technology, Germany and R. Römer, University of Warwick, United Kingdom)

2007 **IBM Faculty Award** **Yorktown Heights, USA**
“To qualify for this internationally competitive award [...] candidates must have an outstanding reputation for contributions in their field or, in the case of junior faculty, show unusual promise.”, \$40,000

1999 **PhD Student Travel Award** **Kyoto, Japan**
Second International Symposium on High-Performance Computing, ISHPC'99, \$2,000

Positions and Experience

Current Significant Leadership and Service Positions

2016–2017 **Program Director** **SIAM Activity Group on Supercomputing**
The SIAM Activity Group on Supercomputing provides a forum for computational mathematicians, computer scientists, computer architects, and computational scientists to exchange ideas on mathematical algorithms and computer architecture needed for simulations on high-performance computer systems.

2015 **Committee Chair Best Paper Prize** **SIAM Activity Group on Supercomputing**
The SIAM Activity Group on Supercomputing (SIAG/SC) Best Paper Prize, established in 2015, is awarded to the authors of the most outstanding paper in the field of parallel scientific and engineering computing.

2014–present **Master Director** **Università della Svizzera italiana**
Director of the Computational Science Master program with tracks in simulation sciences and data sciences at USI.

2013–present **Project Leadership Position** **PASC**
Platform for Advanced Scientific Computing (PASC) is a structuring project jointly supported by the Swiss University Conference (SUC) and the Council of Federal Institutes of Technology (ETH Board).

2013–present **Consulting Position at Swiss National Supercomputing Centre** **CSCS**
Consulting position on scientific computing support and scientific computing engagement.

2013–present **Project Board Member** **SCCER-FURIES**
The SCCER Future Swiss Electrical Infrastructure (FURIES) joins the competencies of the top Swiss academic and industrial actors in the area of power and energy systems to shape the next generation of the electrical Swiss infrastructure.

2012–present **Associate Editor** **SIAM SISC**
SIAM Journal on Scientific Computing

Research

2016–present **Full Professor of Computational Science** **Università della Svizzera italiana**
I lead research on computational science and HPC, advising Postdocs, and PhD, MSc, and BSc students in the Advanced Computing Laboratory at the Institute of Computational Science.

2012–2016 **Associate Professor of Computational Science** **Università della Svizzera italiana**
I led research on computational science and HPC, advising Postdocs, and PhD, MSc, and BSc students in the Advanced Computing Laboratory at the Institute of Computational Science.

2005–2011 **Senior Researcher** **University of Basel, Switzerland**
I independently led several academic and industrial research projects (total financial volume: CHF 3,976,000) on computational science and HPC, advised 3 PhD and 9 MSc students in the Department of Mathematics and Computer Science, and (co)taught 9 courses on the BSc and MSc levels in computer science.

- 2001–2004 **Postdoctoral Fellow** **University of Basel, Switzerland**
Parallel programming and HPC research. Scientific advisor: Helmar Burkhart
- 2002–2003 **Visiting Researcher** **IBM Thomas J. Watson Research Center, Yorktown, USA**
Research on parallel programming, sparse matrix algorithms, and HPC. Scientific host: Anshul Gupta
- 1996–2000 **Research Assistant** **ETH Zurich, Switzerland**
Research on semiconductor device simulation, solver, and HPC. Scientific advisor: Wolfgang Fichtner

Publications

Total: 32 journal papers, 1 edited book, 5 book chapters, 17 top conference papers, 33 workshop and conference papers, **3300+ citations**, **h-index: 24** (Google Scholar); full publication list available at <http://www.ics.inf.usi.ch>

Olaf Schenk and his PhD students and postdocs are underlined.

Technical Reports (submitted)

- IEEE Trans. Smart Grids** A. Fuchs, D. Kourounis, O. Schenk, *Efficient Solutions of Large-Scale Multi-Stage Optimal Power Flow Problems using Inexact Interior Points Methods*, submitted to IEEE Transactions on Smart Grid.
- ACM PASC** B. Reps, S. Donfack, P. Sanan, O. Schenk, W. Vanroose, *A High Arithmetic Intensity Krylov Subspace Method based on Data-Centric Complex Stencil Compiler Programs*, September 2015, submitted to ACM PASC conference.
- J. Comp. Physics** M. Rietmann, M. Grote, D. Peter, O. Schenk, *Newmark Local Time Stepping on High Performance Computing Architectures*, June 2015, submitted to Journal of Computational Physics.
- COMPUTER PHYSICS COMM.** D. Kourounis, L. N. Gergidis, M. A. Saunders, A. Walther, O. Schenk, *Compile-Time Symbolic Differentiation Using C++ Expression Templates*, June 2015, submitted to Computer Physics Communications.
- INVERSE PROBL.** D. Kourounis, L. Gaudio, O. Schenk, *Interior-Point Methods and Identifiability for Time-dependent Full Waveform Inversion*, February 2016, submitted to Journal of Geophysics.

Peer-reviewed Journal Publications

- GENETICS** A. De Coninck, B. Baets, D. Kourounis, F. Verbosio, O. Schenk, S. Maenhout, J. Fostier, *Needles: Large-Scale Genomic Prediction with Marker-by-environment Interaction*, January 2016, Journal of Genetics, DOI: 10.1534/genetics.115.179887
- COMPUT. SCIENCE** J. Brumm, D. Mikushin, S. Scheidegger, O. Schenk, *Scalable High-Dimensional Dynamic Stochastic Economic Modeling*, Journal of Computational Science, 2015, DOI: 10.1016/j.jocs.2015.07.004
- COMG** D. Kourounis, O. Schenk, *Constraint Handling for Gradient-Based Optimization of Compositional Reservoir Flow*, Journal of Computational Geosciences, October 2015, Volume 16(5), pp 1109–1122, DOI: 10.1007/s10596-015-9524-5
- IEEE CiSE** C. Petra, O. Schenk, M. Anitescu, *Real-time Stochastic Optimization of Complex Energy Systems on High Performance Computers*, IEEE Computing in Science & Engineering - Leadership Computing (Volume: 16, Issue: 5), pp. 32–42, 2014. DOI: 10.1109/MCSE.2014.53
- SIAM SISC** M. J. Grote, J. Huber, D. Kourounis, O. Schenk, *Inexact Interior-Point Method for PDE-Constrained Nonlinear Optimization*, SIAM J. Sci. Comput. 36–3, pp. A1251–A1276, 2014. DOI: 10.1137/130921283

- SIAM SISC** C. Petra, O. Schenk, M. Lubin, K. Gärtner, *An Augmented Incomplete Factorization Approach for Computing the Schur Complement in Stochastic Optimization*, SIAM J. Sci. Comput 36–2, pp. C139–C162, 2014. DOI: 10.1137/130908737
- JPDC** G. Kollias, M. Sathe, O. Schenk, A. Grama, *Fast Parallel Algorithms for Graph Similarity and Matching*, Journal of Parallel and Distributed Computing, Volume 75, Issue 5, pp. 2400–2410, May 2014. DOI: 10.1016/j.jpdc.2013.12.010
- IJAMT** S. Wagner, M. Sathe, O. Schenk, *Optimization for Process Plans in Sheet Metal Forming*, The International Journal of Advanced Manufacturing Technology, Volume 71, Issue 5-8, pp 973–982, March 2014. DOI: 10.1007/s00170-013-5515-7
- IEEE Trans. Elec. Devices** M. Luisier, O. Schenk, *Gate-Stack Engineering in n-type Ultra-Scaled Si Nanowire Field-Effect Transistors*, IEEE Transactions on Electron Devices, pp. 3325–3329, Oct 2013. DOI: 10.1109/TED.2013.2278573
- G³** P. Basini, T. Nissen-Meyer, L. Boschi, E. Casarotti, J. Verbeke, O. Schenk, D. Giardini, *The Influence of Nonuniform Ambient Noise on Crustal Tomography in Europe*, Geochem. Geophys. Geosyst., 14, 1471–1492, 2013. DOI: 10.1002/ggge.20081
- PARCO** M. Sathe, O. Schenk, H. Burkhart, *An Auction-Based Weighted Matching Implementation on Massively Parallel Architectures*, Parallel Computing 38, pp. 595–614, 2012. DOI: 10.1016/j.parco.2012.09.001
- Math. Prog.** F. Curtis, J. Huber, O. Schenk, A. Wächter, *A Note on the Implementation of an Interior-Point Algorithm for Nonlinear Optimization with Inexact Step Computations*, Mathematical Programming Series B, 32(6), 3447–3475, 2012. DOI: 10.1007/s10107-012-0557-4.
- JCSR** M. Christen, O. Schenk, H. Burkhart, *Automatic Code Generation and Tuning for Stencil Kernels on Modern Microarchitecture*, Journal Computer Science Research and Development, in Proceedings of the International Supercomputing Conference, ISC11, Volume 26, pp. 205–210, 2011. DOI: 10.1007/s00450-011-0160-6
- SIAM SISC** F. E. Curtis, O. Schenk, A. Wächter, *An Interior-Point Algorithm for Large-Scale Nonlinear Optimization with Inexact Step Computations*. SIAM J. Sci. Comput. Volume 32, Issue 6, pp. 3447–3475, 2010. DOI: 10.1137/090747634
- SIAM SISC** M. Bollhöfer, M. Grote, O. Schenk, *Algebraic Multilevel Preconditioning to Helmholtz’s Equation for Inhomogeneous Media*, SIAM J. Scientific Computing, Volume 31(5), pp. 3781–3805, 2009. DOI: 10.1137/080725702
- JCSR** O. Schenk, M. Manguoglu, A. Sameh, M. Christen, M. Sathe, *Parallel Scalable PDE-Constrained Optimization: Antenna Identification in Hyperthermia Cancer Treatment Planning*, in Proceedings of the International Supercomputing Conference, ISC’09, Journal Computer Science Research and Development, pp. 177–183, 23(3), 2009. DOI: 10.1007/s00450-009-0080-x
- SIAM SISC** O. Schenk, A. Wächter, M. Weiser, *Inertia Revealing Preconditioning For Large-Scale Non-convex Constrained Optimization*, SIAM J. Sci. Comput., pp. 939–960 31(2), 2008. DOI: 10.1137/070707233
- JPDC** O. Schenk, M. Christen, H. Burkhart, *Algorithmic Performance Studies on Graphics Processing Units*, J. Parallel and Distributed Computing, 68, 1360–1369, 2008. DOI: 10.1016/j.jpdc.2008.05.008
- SIAM Review** O. Schenk, M. Bollhöfer, R. Römer, *On Large-Scale Diagonalization Techniques for the Anderson model of Localization*, SIAM Review, pp. 91–112, 50, 2008, DOI: 10.1137/050637649

- COMPUT. OPTIM. APPL.** O. Schenk, A. Wächter, M. Hagemann, *Matching-based Preprocessing Algorithms to the Solution of Saddle-Point Problems in Large-Scale Nonconvex Interior-Point Optimization*, Journal of Computational Optimization and Applications, pp. 321–341, 32 (2-3), 2007, DOI: 10.1007/s10589-006-9003-y
- GAMM** M. Bollhöfer, O. Schenk, *Combinatorial Aspects in Sparse Direct Solvers*, GAMM Mitteilungen, Vol. 29, pp. 342–367, 2006, DOI: 10.1002/gamm.201490037
- ETNA** O. Schenk, K. Gärtner, *Fast Factorization Pivoting Methods for Sparse Symmetric Indefinite Systems*. Electronic Transactions on Numerical Analysis, 23, 2006, pp. 158–179.
- SIAM SISC** O. Schenk, M. Bollhöfer, R. Römer, *On Large-Scale Diagonalization Techniques for the Anderson model of Localization*, SIAM J. Sci. Comput., 28 (2006), pp. 963–983. DOI: 10.1137/050637649
- SIAM SISC** M. Hagemann, O. Schenk, *Weighted Matchings for Preconditioning Symmetric Indefinite Linear Systems*, SIAM J. Sci. Comput., 28, pp. 403–420, 2006, DOI: 10.1137/040615614
- COMPUT. STRUCT** O. Schenk, M. Hillmann, *Optimal Design of Metal Forming Die Surfaces with Evolution Strategies*, Computer & Structures, 82, pp. 1695–1705, 2004. DOI: 10.1016/j.compstruc.2004.03.055
- IEEE TCAD** O. Schenk, S. Röllin, A. Gupta, *The Effects of Unsymmetric Matrix Permutations and Scalings in Semiconductor Device and Circuit Simulation*, IEEE Transactions on Computer-Aided Design of Integrated Circuits and Systems, 23, pp. 400–411, 2004. DOI: 10.1109/TCAD.2004.823345
- JFGCS** O. Schenk, K. Gärtner, *Solving Unsymmetric Sparse Systems of Linear Equations with PARDISO*, J. of Future Generation Computer Systems, 20, pp. 475–487, 2004. DOI: 10.1016/j.future.2003.07.011
- PARCO** O. Schenk, K. Gärtner, *Two-Level Scheduling in PARDISO: Improved Scalability on Shared Memory Multiprocessing Systems*, Parallel Computing, pp. 187–197., 28, 2002. DOI: 10.1016/S0167-8191(01)00135-1
- ISECS** O. Schenk, K. Gärtner, B. Schmithüsen, W. Fichtner. *Numerical Semiconductor Device and Process Simulation on Shared Memory Multiprocessors: Algorithms, Architectures, Results*. The Kluwer International Series in Engineering and Computer Science, 515, pp. 141–157, 1999.
- JFGCS** O. Schenk, K. Gärtner, W. Fichtner, A. Stricker, *PARDISO: A High-Performance Serial and Parallel Sparse Linear Solver in Semiconductor Device Simulation*, J. of Future Generation Computers Systems, 18, pp. 69–78, 2001 DOI: 10.1016/S0167-739X(00)00076-5
- BIT** O. Schenk, K. Gärtner, W. Fichtner, *Scalable Parallel Sparse Factorization with Left-Right Looking Strategy on Shared Memory Multiprocessors*, BIT Numerical Mathematics, 40, pp. 158–176, 1999.
- Speedup Journal** K. Gärtner, O. Schenk, W. Fichtner, *Parallel Multigrid Methods for the Continuity Equations in Semiconductor Device Simulation*, Speedup Journal, 12, pp. 67–72, 1999.

Peer-reviewed Conference Publications

- LNCS** L. Riha, T. Brzobohaty, A. Markopoulos, T. Kozubek, O. Schenk, W. Vanroose, *Efficient Implementation of FETI Solver for Multi and Many-Core Architectures using Schur Complements*, September 2015, Proceedings of the International Conference on High Performance Computing in Science and Engineering, HPCSE2015, Lecture Notes in Computer Science (LNCS), Vol: 9611, Springer, 2016, DOI:10.1007/978-3-319-40361-8_6
- PDP'15** A. De Coninc, D. Kourounis, F. Verbosio, O. Schenk, B. De Baets, S.. Maenhout, J. Fostier, *Towards Parallel Large-scale Genomic Prediction by Coupling Sparse and Dense Matrix Algebra*, in Proceedings of the 23rd Euromicro International Conference on Parallel, Distributed, and Network-Based Processing, 747–750, 2015. DOI: 10.1109/PDP.2015.94

- IPDPS'15** M. Rietmann, M.J. Grote, D. Peter, O. Schenk, B. Ucar, *Load-balanced Local Time Stepping for Large-Scale Wave Propagation*, in Proceedings of the 29th IEEE International Parallel & Distributed Processing Symposium, IPDPS'15, IEEE Computer Society, May 2015, DOI:10.1109/IPDPS.2015.10 (acceptance rate: 21.8%, 108/496)
- AGU'14** P. Sanan, S. Schnepf, D. May, O. Schenk, *Composite Solvers for Linear Saddle Point Problems Arising from the Incompressible Stokes Equations with Highly Heterogeneous Viscosity Structure*, American Geophysical Union. Fall Meeting, San Francisco, Dec. 15-19, 2014.
- Euro-Par'13** A. Kuzmin, M. Luisier, O. Schenk, *Fast Methods for Computing Selected Elements of the Green's Function in Massively Parallel Nanoelectronic Device Simulations*, Euro-Par 2013, LNCS 8097, F. Wolf, B. Mohr, and D. an Ney (Eds.), Springer-Verlag, pp. 533–544, 2013, DOI: 10.1007/978-3-642-40047-6_54
- Wave'13** L. Gaudio, M. J. Grote, O. Schenk, *Interior Point Method for Time-Dependent Inverse Problems*, in Proceedings of 11th Internat. Conf. on Math. and Numerical Aspects of Wave Propagation (WAVES 2013), pp. 121-122, 2013.
- SC'12** M. Rietmann, O. Schenk, P. Messmer, T. Nissen-Meyer, D. Peter, P. Basini, D. Komatitsch, J. Tromp, L. Boschi, D. Giardini, *Forward and Adjoint Simulations of Seismic Wave Propagation on Emerging Large-Scale GPU Architectures*, in Proceedings of the International Conference on High Performance Computing, Networking, Storage and Analysis, SC'12, pages 38:1–38:11. IEEE Computer Society Press, Nov. 2012, DOI: 10.1109/SC.2012.59 (acceptance rate: 21%, 100/472).
- SC'12** M. Christen, O. Schenk, Y. Cui, *PATUS: Parallel Auto-Tuned Stencils For Scalable Earthquake Simulation Codes*, in Proceedings of the International Conference on High Performance Computing, Networking, Storage and Analysis, SC'12, pages 38:1–38:11. IEEE Computer Society Press, Nov. 2012, DOI: 10.1109/SC.2012.95 (acceptance rate: 21%, 100/472)
- PGAS'12** H. Burkhart, M. Sathe, M. Christen, M. Rietmann, O. Schenk, *Run, Stencil, Run, HPC Productivity Studies in the Classroom*, 6th Conference on Partitioned Global Address Space Programming Models, October 10-12, 2012, Santa Barbara, USA.
- ICCS'12** M. Christen, O. Schenk, *A Performance Study of an Anelastic Wave Propagation Code Using Auto-tuned Stencil Computations*, Proceedings of the International Conference on Computational Science, ICCS 2012, Eds., vol. 9. Elsevier, 2012, pp. 956–965, DOI:10.1016/j.procs.2012.04.102
- IPDPS'11** M. Christen, O. Schenk, H. Burkhart, *Patus: A Code Generation and Autotuning Framework For Parallel Iterative Stencil Computations on Modern Microarchitectures*, in Proceedings of the 25th IEEE International Parallel & Distributed Processing Symposium, IPDPS'11, pages 676–687, IEEE Computer Society, May 2011, DOI: 10.1109/IPDPS.2011.70 (acceptance rate: 19.6%, 112/571)
- Wave'11** M. Grote, J. Huber, O. Schenk, *Inexact Interior-Point Methods for Time-Harmonic Inverse Medium Problems*, 10th International Conference on Mathematical and Numerical Aspects of Waves, Simon Fraser University Harbor Center, Vancouver, Canada. July 2011.
- ICCS'11** M. Grote, J. Huber, O. Schenk, *Towards Interior Point Methods for the Inverse Medium Problem on Massively Parallel Architectures*, Procedia Computer Science Volume 4, 2011, pp. 1466-1474, Proceedings of the International Conference on Computational Science, ICCS 2011. DOI: 10.1016/j.procs.2011.04.159
- PARS'11** H. Burkhart, M. Christen, M. Rietmann, M. Sathe, O. Schenk, *Run, Stencil, Run! - A Comparison of Modern Parallel Programming Paradigms*, PARS - Workshop on Parallel Systems and Algorithms PARS 2011, May 26-27, 2011, IBM Research RÄijschlikon, Switzerland.
- PARS'11** M. Sathe, O. Schenk, M. Christen, H. Burkhart, *A Parallel PDE-Constrained Optimization Framework for Biomedical Hyperthermia Treatment Planning*, PARS-Mitteilungen (ISSN 0177-0454).

- Euro-Par'09** M. Manguoglu, A. Sameh, O. Schenk, *PSPIKE — Parallel Sparse Linear System Solver*, Proceedings of the 15th International Euro-Par Conference on Parallel Processing, Lecture Notes in Computer Science, Volume 5704/2009, pp. 797-808, DOI 10.1007/978-3-642-03869-3.
- IPDPS'09** M. Christen, O. Schenk, P. Messmer, E. Neufeld, H. Burkhart, *Parallel Data-Locality Aware Stencil Computations on Modern Micro-Architectures*, in Proceedings of the 23th IEEE International Parallel & Distributed Processing Symposium, IPDPS'09, pages 1–10, IEEE Computer Society, May 2009, DOI: 10.1109/IPDPS.2009.5161031 (acceptance rate: 18.2%, 102/591)
- EMO'09** M. Sathe, O. Schenk, and H. Burkhart, *Solving Bi-Objective Many-Constraint Bin Packing Problems in Automobile Sheet Metal Forming Processes*, Proceedings of the 5th International Conference on Evolutionary Multi-Criterion Optimization, Nantes, France, April 2009, Lecture Notes in Computer Science, Springer, 5467, pp. 246-261, 2009, DOI: 10.1109/IPDPS.2011.70
- MICRO-41** M. Christen, O. Schenk, P. Messmer, E. Neufeld, H. Burkhart, *Biomedical Hyperthermia Cancer Treatment Planning on Leading Multicore Platforms*, Proceedings of the First International Workshop on New Frontiers in High-performance and Hardware-aware Computing (HipHaC'08). IEEE/ACM International Symposium on Microarchitecture (MICRO-41), pp. 47-54, ISBN 978-3-86644-298-6, November 8, 2008, Lake Como, Italy.
- CUDA'07** M. Christen, O. Schenk, H. Burkhart, *General-Purpose Sparse Matrix Building Blocks using the NVIDIA CUDA Technology Platform*, First Workshop on General Purpose Processing on Graphics Processing Units, Boston, Oct 04, 2007.
- ICIAM'07** O. Schenk, M. Bollhöfer, R. Römer, *On Large-Scale Diagonalization Techniques for the Anderson Model of Localization*, In Proc. of the 6th International Congress on Industrial and Applied Mathematics, ETH Zurich, Switzerland July 25-29, 2007, DOI: 10.1002 /pamm.200700768
- ECCOMAS'06** M. Bollhöfer, M. Grote, O. Schenk, *Algebraic Multilevel Preconditioning for Helmholtz Equation*, In Proc. of Europ. Conf. on Comput. Fluid Dynamics (ECCOMAS CFD 2006), held in Egmond aan Zee, The Netherlands, Sept. 5-8, 2006.
- PARA'04** S. Röllin, O. Schenk, *Maximum-Weighted Matching Strategies and the Application to Symmetric Indefinite Systems*, in J. Dongarra, K. Madsen, J. Wasniewski (Eds.): Applied Parallel Computing, State of the Art in Scientific Computing, 7th International Workshop, PARA 2004, Lyngby, Denmark, June 20-23, 2004, Springer 2006, ISBN 3-540-29067-2, Lecture Notes in Computer Science, Springer, 3732 (2006), pp. 808–817. DOI: 10.1007/11558958_97
- Euro-Par'04** K. Furlinger, O. Schenk, M. Hagemann, *Task-Queue Based Hybrid Parallelism: A Case Study*, in Euro-Par 2004 Parallel Processing, 10th International Euro-Par Conference, Pisa, Italy, August 31-September 3, 2004, pp. 624–631, DOI: 10.1007/978-3-540-27866-5_82
- CompLife'05** P. Banushkina, O. Schenk, M. Meuwly, *Efficiency Considerations in Solving Smoluchowski Equations for Rough Potentials*, in M. R. Berthold, R. C. Glen, K. Diederichs, O. Kohlbacher, I. Fischer (Eds.): Computational Life Sciences, First International Symposium, CompLife 2005, Konstanz, Germany, September 25-27, Proceedings. Springer, ISBN 3-540-29104-0, Lecture Notes in Computer Science, 3695, pp. 208–216, 2005, DOI: 10.1007/11560500_19
- SISPAD'03** O. Schenk, M. Hagemann, S. Röllin, *Recent Advances in Sparse Linear Solver Technology for Semiconductor Device Simulation Matrices*, In Proc. of the 2003 IEEE International Conference on Simulation of Semiconductor Processes and Devices, pp. 103–108, ISBN 0-07803-7826-1, September 3-5, 2003.
- Comp-Fluid'03** O. Schenk, M. Selig, *Advancing Crash Forming Capabilities through Solver Technology*, Proc. of the Second M.I.T. Conference on Computational Fluid and Solid Mechanics, 1 (2003), pp. 628–631, ISBN 0-08-044046-0, June 17-21, 2003, Boston, USA.

- ICCS'02** O. Schenk, K. Gärtner, *Solving Unsymmetric Sparse Systems of Linear Equations with PARDISO*, in P. M. A. Sloot, C. Jeng, K. Tan, J. Dongarra, A. G. Hoekstra (Eds.), Computational Science - ICCS 2002, International Conference, Amsterdam, The Netherlands, April 21-24, 2002, Proceedings, Springer, ISBN 3-540-43593-X , Lecture Notes in Computer Science, 2330 (2002), pp. 355–363. DOI: 10.1007/3-540-46080-2_37
- SIAM SC'01** O. Schenk, K. Gärtner, *Sparse Factorization with a Two-Level Scheduling in PARDISO*, Proc. of the Tenth SIAM Conference on Parallel Processing for Scientific Computing, CD-ROM, held in Portsmouth, Virginia, USA, March 12-14, 2001.
- IMACS'00** O. Schenk, K. Gärtner, *Scalable Parallel Sparse LU Factorization with a Dynamical Supernode Pivoting Approach in Semiconductor Device Simulation*, Proc. of the 16th IMACS World Congress 2000, Lausanne, Switzerland, August 21-25, 2000.
- HPCN'99** O. Schenk, W. Fichtner, K. Gärtner, *Scalable Parallel Sparse Factorization with Left-Right Looking strategy on Shared Memory Multiprocessors*, in P. M. A. Sloot, M. Bubak, A. G. Hoekstra, L. O. Hertzberger (Eds.): HPC and Networking, 7th International Conference, HPCN Europe 1999, Amsterdam, The Netherlands, Proceedings, Springer 1999, ISBN 3-540-65821-1, Lecture Notes in Computer Science, 1593 (1999), pp. 221–230. DOI: 10.1007/BFb0100583
- ISHPC'99** O. Schenk, W. Fichtner, K. Gärtner, *Application of Parallel Sparse Direct Methods in Semiconductor Device and Process Simulation*, in C. D. Polychronopoulos, K. Joe, A. Fukuda, S. Tomita (Eds.): High Performance Computing, Second International Symposium, ISHPC'99, Kyoto, Japan, 1999, Proceedings. Springer 1999, ISBN 3-540-65969-2, Lecture Notes in Computer Science, 1615 (1999), pp. 206–219, DOI: 10.1007/BFb0094923
- LNCSE** K. Gärtner, O. Schenk, W. Fichtner, *Parallel Multigrid Methods for the Continuity Equations in Semiconductor Device Simulation*, in H. J. Bungartz, C. Zenger (Eds.): High Performance Scientific and Engineering Computing, Lecture Notes in Computational Science and Engineering, 8 (1998), pp. 325–342.
- Precon'99** A. Pomp, O. Schenk, W. Fichtner, *An ILU Preconditioners Adapted to Diffusion Processes in Semiconductors*, Proc. of Preconditioning 1999, Conference on Preconditioning Techniques for Large Sparse Matrix Problems in Industrial Applications, June, 1999, Minneapolis, USA.
- PDPTA'98** O. Schenk, W. Fichtner, K. Gärtner, *Parallel Sparse LU Factorization in a Shared Memory Computing Environment*, Proc. of the PDPTA98, CSREA Press, pp. 907–914, ISBN 1-892512-05-x, Las Vegas, Nevada, USA, July 13-16, 1998.

Edited Books

- CRC Press** U. Naumann, O. Schenk (Editors), *Combinatorial Scientific Computing*, book in the Computational Science series from Chapman and Hall/CRC, 2012. DOI: 10.1201/b11644-18

Book Chapters

- CRC Press** J. Huber, U. Naumann, O. Schenk, A. Wächter, *Algorithmic Differentiation and Nonlinear Optimization for an Inverse Medium Problem*, Chapter in Combinatorial Scientific Computing by U. Nauman and O. Schenk (Editors), pp. 203-232, book in the Computational Science series from Chapman and Hall/CRC, 2012, DOI: 10.1201/b11644-18
- CRC Press** O. Schenk, M. Saathe, B. Ucar, A. Sameh, *Towards A Scalable Hybrid Linear Solver Based On Combinatorial Algorithms*, chapter in Combinatorial Scientific Computing by U. Nauman and O. Schenk (Editors), pp. 96-127, book in the Computational Science series from Chapman and Hall/CRC, 2012, DOI: 10.1201/b11644-18

- CRC Press** O. Schenk, M. Christen, H. Burkhart, *Parallel Stencil Computations on Manycore Architectures in Hyperthermia Applications*, Scientific Computing with Multicore and Accelerators by D. Bader and J. Dongarra (Editors), Computational Science series from Chapman and Hall/CRC Press, Taylor and Francis Group. pp. 255–277, 2011. DOI: 10.1201/b10376-10, 2010.
- Springer** O. Schenk, K. Gärtner, *Parallel Numerical Linear Algebra*, invited book chapter in Encyclopedia of Parallel Computing, D. Padua (Editor), pp. 1458–1464, Springer, 2012, ISBN 978-0-387-09765-7.
- Elsevier** O. Schenk, H. van der Vorst, *Solution of Linear Systems*, chapter in Handbook of Numerical Analysis, Volume XIII: Numerical Methods in Electromagnetics, Elsevier Science, ISBN 0-444-513752, pp. 755–824, 2005.

Edited Journals

- DAGSTUHL** C. Lengauer, M. Bolten, R. D. Falgout, O. Schenk, 15161 Abstracts Collection, *Advanced Stencil-Code Engineering*, 15161, Dagstuhl Seminar Proceedings, pp. 56–75, Schloss Dagstuhl - Leibniz-Zentrum für Informatik, Germany, 2015. DOI: 10.4230/DagRep.5.4.56
- PARCO** P. Arbenz, L. Grigori, R. Krause, O. Schenk, *Guest editorial: Special Issue on Parallel Matrix Algorithms and Applications (PMAA'14)*, Parallel Computing, to appear in 2016.
- PARCO** C. Bekas, A. Grama, O. Schenk, Y. Saad, *Guest editorial: Special Issue on Parallel Matrix Algorithms and Applications (PMAA'12)*, Parallel Computing, Volume 40, Issue 7, pp. 159–160, July 2014. DOI: 10.1016/j.parco.2014.06.001
- PARCO** P. Arbenz, Y. Saad, A. Sameh, O. Schenk: *Guest editorial: Special Issue on Parallel Matrix Algorithms and Applications (PMAA'10)*, Parallel Computing, 37(12):731–732, 2011. DOI: 10.1016/j.parco.2011.10.011
- DAGSTUHL** U. Naumann, O. Schenk, H. Simon, S. Toledo, 09061 Abstracts Collection, *Combinatorial Scientific Computing*, 09061, Dagstuhl Seminar Proceedings, 1862-4405, Schloss Dagstuhl - Leibniz-Zentrum für Informatik, Germany, 2009
- JFGCS** P. Arbenz, H. Burkhart, O. Schenk, E. Mähle, *SPEEDUP/PARS Workshop on Modern Algorithms in Computational Sciences and Information Technology*, J. of Future Generation Computer Systems, 21 (8), pp. 1249–1250, 2005, DOI: 10.1016/j.future.2004.09.002

Monographic Thesis

PhD Thesis

- Title** *Parallel Sparse LU Factorization Methods on Shared Memory Multiprocessors*
- Supervisors** Professor Wolfgang Fichtner (ETH Zurich) & Professor Martin Gutknecht (ETH Zurich)
- Description** This dissertation presents new techniques for solving large sparse symmetric and structurally symmetric linear systems on shared memory high performance parallel computers, using Gaussian elimination with complete supernode pivoting. Shared memory multiprocessors have recently attracted considerable interest in scientific and engineering computing and the objective is to increase the parallel performance on these architectures. The efficiencies of the algorithms are demonstrated for matrices from various application fields and for a variety of high performance computers
- Place** ETH Zurich, 2000, Series in Microelectronics, Volume 89, Hartung-Gorre, ISBN 3-89649-532-1.
- doi** [dx.doi.org/10.3929/ethz-a-003876213](https://doi.org/10.3929/ethz-a-003876213)

Habilitation Thesis

- Title** *Scientific Computing - Algorithms, Combinatorics, High-Performance Computing, and Applications*

Prof. Dr. sc. techn. Olaf Schenk, Via Marco Da Carona 6 – CH-6900 Lugano

☎ +41 793682281 • ✉ olaf.schenk@usi.ch • 🌐 <http://www.ics.inf.usi.ch>

9/21

- Place Department of Computer Science and Mathematics, Faculty of Science, University of Basel, Switzerland, March 2010.
- Description This research introduced some of the many ways in which combinatorial abstractions and numerical algorithms in computer science play a role in computational science. It is explained how these algorithms might be useful in scientific applications. It deals in particular with scientific algorithmic research and high-performance computing architectures to enable large-scale simulations and optimizations. This is a discipline where computing power is a critical issue in almost every application. Complex simulation models containing more degrees of freedom not only require more available space in memory, but also demand faster computing architectures, sophisticated algorithms, and modern HPC technology to compute solutions to these models within an acceptable time frame. In general, the research spans the entire stack, from advanced information technology to scientific algorithmic research.

Selected Invited Keynote or Seminar Talks

Only listing keynote or invited seminar talks since 2012 (start at USI), not counting normal conference or workshop presentations

- Keynote **HPCSE17 University of Ostrava & IT4Innovations National Supercomputing Center, Czech Republic**
Title: TBA
- Keynote **1st International Symposium on Research and Education of Computational Science (RECS), University of Tokyo Tokyo, Japan**
Title: TBA, Dec. 2016
- ZICE'16 **Zurich Initiative on Computational Economics Zurich, Switzerland**
Applications of Large-Scale Nonlinear Optimization at the Petascale: Achievements and Perspectives in Switzerland, February 2016
- Keynote **First Annual Meeting of Applied Mathematics: Frontier Aspects of Applied Mathematics National Taiwan University, Taipei, Taiwan**
Extreme-Scale Stochastic Optimizations: HPC, Numerics and Applications, December 2015
- Keynote **16th IEEE International Parallel and Distributed Scientific and Engineering Computing Workshop Hyderabad, India**
Performance Engineering for Large-Scale Stochastic Optimizations on Petascale Architectures (declined), May 2015
- ZICE'15 **Zurich Initiative on Computational Economics Zurich, Switzerland**
Applications of Large-Scale Nonlinear Optimization at the Petascale: Achievements and Perspectives in Switzerland, February 2015
- distinguished speaker/UBC **Pacific Institute for the Mathematical Sciences Vancouver, Canada**
Performance Engineering of Seismic Simulations for Future Exascale Architectures, January 2015
- SCAIM UBC **Scientific Computing, Applied & Industrial Mathematics Seminar Vancouver, Canada**
Performance Engineering & Sparse Matrices: Introduction, Applications and Supercomputing, January 2015
- Uni Basel **Numerical Analysis Seminar University of Basel, Switzerland**
Performance Engineering & Sparse Matrices: Introduction, Applications and Supercomputing, Dec. 2014

- Keynote **JST/CREST International Symposium on Post Petascale System Software Kobe, Japan**
ISP2S2 Performance Engineering for Large-Scale Stochastic Optimizations on Petascale Architectures, Dec. 2014
- Keynote Ex- **SPPEXA Workshop ExaStencils 2014 Technical University of Dresden, Germany**
aStencils'14 High-Level Software Approaches for HPC: Overview and Case Study (declined), March 2014
- Keynote **ASCETE Workshop on advanced numerical methods for earthquake and tsunami simulation on modern HPC systems**
ASCETE'14 Sudelfeld, Germany
Seismic Structured Grid Simulations on Many-Core Architectures, May 2014
- ZICE'14 **Zurich Initiative on Computational Economics** **Zurich, Switzerland**
Applications of Large-Scale Nonlinear Optimization at the Petascale: Achievements and Perspectives in Switzerland, February 2014
- Semi- **HPCSE13 University of Ostrava & IT4Innovations National Supercomputing**
Keynote **Center, Czech Republic**
HPCSE13 Interior Point Methods for Large-Scale Stochastic Optimization on High-Performance Computers, May 2013
- Keynote **HPC Advisory Council Switzerland Conference** **Lugano, Switzerland**
HPCAdvisory Large-Scale PDE-Constrained Optimization on HPC Architectures: Applications, Algorithms and
Council'12 Software, March 2012
- Keynote **Teratec International meeting for Simulation and HPC** **Ecole Polytechnique,**
Teratec **France**
Forum'12 Exascale Computing Research Challenges, June 2012
- Semi- **Accelerating Computational Science Symposium 2012** **Washington, DC, USA**
Keynote Large-Scale Seismic Imaging on HPC Architectures: Applications, Algorithms and Software, May
ACSS'12 2012

CSE Software Impact

- Sparse **PARDISO Sparse Matrix Solver Software**
Solvers The fastest multi-threaded sparse direct matrix solver software for arbitrary matrices. The software has been integrated into the Intel Math Kernel Library, used by > ten thousand users. One paper cited >900 since 2005. Available from www.pardiso-project.org
- Optimization **Parallel Solver and Interior-Point Optimizations**
Algorithm Proposed algorithms and linear solver reference implementation that are now used in virtually every interior-point implementation, e.g., in IPOPT (Wilkinson Prize for Numerical Software in 2011).

External Funding (Submitted)

Total: raised \approx CHF 6,202,548 in funding from government and industry; **since 2012 (start at USI):** raised CHF 2,226,548. Olaf Schenk's portion of the funding is shown in brackets.

- 2017-2020 **Swiss Commission for Technology&Innovation** **Università della Svizzera italiana**
CHF 10'000'000 (USI: CHF 252,324) on "Computational Approaches for the Design and Operation of the Energy Management System in Future Electric Power Systems" PI: O. Schenk (USI), Partner: SwissGrid, Laufenburg.

External Funding (accepted)

- 2016-2018 **Swiss Commission for Technology&Innovation** **Università della Svizzera italiana**
CHF 1'165'614 (USI: CHF 236'852) on "Efficient Simulation and Optimization for Reliable Inter-coupled Multi-Energy Carrier Systems" PI: G. Hug (ETH Zurich), O. Schenk (USI), Partner: NEPLAN, Zurich.
- 2016 **Swiss National Science Foundation** **Università della Svizzera italiana**
CHF 16,000 (USI: CHF 0,000) on 3rd Platform for Advanced Scientific Computing Conference, PI: J. Hesthaven (EPFL), Co-PI: O. Schenk (USI), et. al.
- 2016-2018 **Swiss National Science Foundation** **Università della Svizzera italiana**
EURO 660,574 (USI: CHF 178,000) on Dual-Phase Steels – From Micro to Macro Properties (EXASTEEL-2), - **German Priority Programme 1648 Software for Exascale Computing**, PI: A. Klawonn (Coordinator, Cologne, Germany), Co-PI: O. Rheinbach (Freiberg, Germany), D. Balzani (Dresden, Germany), J. Schröder (Essen, Germany), O. Schenk (USI), G. Wellein (Erlangen, Germany)
- 2015-2017 **Platform for Advanced Scientific Computing (PASC)** **Università della Svizzera italiana**
CHF 250,000 (USI: CHF 18,000) on Tackling Large Dynamic Stochastic Equilibrium Models with Occasionally Binding Constraints, PI: F. Kubler (University of Zurich), Co-PI: O. Schenk (USI), et. al.
- 2014-2017 **Platform for Advanced Scientific Computing (PASC)** **Università della Svizzera italiana**
CHF 80,000 (USI: CHF 80,000) on PASC Conference Series 2014-2017, PI: O. Schenk (USI), Co-PI: 8 additional computational science Swiss faculty members from other Swiss universities.
- 2013-2016 **Platform for Advanced Scientific Computing (PASC)** **Università della Svizzera italiana**
CHF 320,000 (USI: CHF 320,000) on HPC Application Support for the PASC Solid Earth Dynamics Community, PI: A. Fichtner (ETHZ), Co-PI: O. Schenk (USI), et. al.
- 2015-2016 **Platform for Advanced Scientific Computing (PASC)** **Università della Svizzera italiana**
CHF 655,000 (USI: CHF 200,400) on ANSWERS: Accelerating Nano-Device Simulations with Extreme-Scale Algorithms and Software Co-Integration, PI: M. Luisier (ETHZ), Co-PI: O. Schenk (USI), et. al.
- 2014-2016 **Platform for Advanced Scientific Computing (PASC)** **Università della Svizzera italiana**
CHF 759,000 (USI: CHF 282,492) on GeoPC: Infrastructure Development for Hybrid Parallel Smoothers for Multigrid Preconditioners, PI: Tackley (ETHZ), Co-PI: O. Schenk (USI), et. al.
- 2014-2016 **Swiss Commission for Technology and Innovation****Università della Svizzera italiana**
CHF 10,000,000 (USI: CHF 184,000) on Future Swiss Electrical Infrastructure (SCCER-FURIES), PI: M. Paolone (EPFL), Co-PI: O. Schenk (USI) et. al. (32 additional Swiss research partners).
- 2013-2016 **EU-FP7-Information and Communication Technologies** **Università della Svizzera italiana**
€3,385,000 (USI: €299,000) for the EXA2CT European Project EXascale Algorithms and Advanced Computational Techniques, PI: Verachtert (Imec), Co-PI: O. Schenk (USI) et.al.

- 2015 **Schloss Dagstuhl - Leibniz-Zentrum für Informatik** **Università della Svizzera italiana**
Grant: one week at the Dagstuhl center on Advanced Stencil-Code Engineering, PI: C. Lengauer (Univ. of Passau), Co-PI: O. Schenk (USI), et. al.
- 2014-2017 **Swiss National Science Foundation** **Università della Svizzera italiana**
CHF 328,000 (USI: CHF 164,000) on Towards Extreme-Scale Coupled Electrothermal Simulations of Realistic Nano-Devices, PI: O. Schenk (USI), Co-PI: A. Schenk (ETHZ).
- 2013-2016 **Platform for Advanced Scientific Computing (PASC)** **Università della Svizzera italiana**
CHF 699,000 (USI: CHF 252,656) on GeoScale: A Framework for Multi-Scale Seismic Modelling and Inversion, PI: A. Fichtner (ETHZ), Co-PI: O. Schenk (USI), et. al.
- 2013 **Swiss National Science Foundation** **Università della Svizzera italiana**
CHF 8,000 (USI: CHF 8,000) on 22nd International Conference on Domain Decomposition Methods, PI: R. Krause (USI), Co-PI: O. Schenk (USI), et. al.
- 2012-2013 **HP2C** **Università della Svizzera italiana**
CHF 100,000 (USI: CHF 40,000) on PASC Geophysics Community Network, PI: T. Nissen-Meyer (ETHZ), Co-PI: O. Schenk (USI), et. al.
- 2013-2014 **Swiss National Science Foundation** **Università della Svizzera italiana**
CHF 339,000 (USI: CHF 200,000) on Seismic Inversion for Waves in Strongly Heterogeneous Media, PI: M. Grote (University of Basel), Co-PI: O. Schenk (USI).
- 2010-2013 **HP2C** **University of Basel**
CHF 1,105,000 (Univ. of Basel: CHF 785,000) on Large-Scale Nonlinear Optimization for High Resolution 3D-Seismic Imaging, PI: O. Schenk (USI), Co-PI: Burkhart (Univ. of Basel), Grote (Univ. of Basel), Giardini (ETHZ)
- 2010-2012 **Swiss Commission for Technology and Innovation** **University of Basel**
CHF 550,000 on Automobile Simulation and Visualization on Manycores, PI: H. Burkhart (Univ. of Basel), Co-PI: O. Schenk (Univ. of Basel)
- 2010 **Schloss Dagstuhl - Leibniz-Zentrum für Informatik** **University of Basel**
Grant: one week at the Dagstuhl center on Combinatorial Scientific Computing, PI: Naumann (RWTH Aachen) , Co-PI: O. Schenk (Univ. of Basel), et. al.
- 2010 **Industry – IBM** **University of Basel**
\$ 7,000 on IBM Academic Visiting Fellowship, Yorktown Heights, NY, USA, PI: O. Schenk (Univ. of Basel)
- 2010-2012 **Swiss National Science Foundation** **University of Basel**
CHF 160,000 on Multiscale Analysis and Inversion for Waves in Strongly Heterogeneous Media, PI: M. Grote (Univ. of Basel), Co-PI: O. Schenk (Univ. of Basel)
- 2009 **Industry – IBM** **University of Basel**
\$ 7,000 on IBM Academic Visiting Fellowship, Yorktown Heights, NY, USA, PI: O. Schenk (Univ. of Basel)
- 2008-2010 **Swiss National Science Foundation** **University of Basel**
CHF 160,000 on Multiscale Analysis and Simulation for Waves in Strongly Heterogeneous Media, PI: M. Grote (Univ. of Basel), Co-PI: O. Schenk (Univ. of Basel)
- 2008 **Industry – IBM** **University of Basel**
\$ 7,000 on IBM Academic Visiting Fellowship, Yorktown Heights, NY, USA, PI: O. Schenk (Univ. of Basel)

- 2007-2010 **Swiss National Science Foundation** **University of Basel**
CHF 147,000 on Large-Scale PDE-Constrained Optimization in Hyperthermia Cancer Treatment Planning, PI: H. Burkhart (Univ. of Basel), Co-PI: O. Schenk (Univ. of Basel)
- 2006-2011 **Industry – Computer Simulation Technology AG** **University of Basel**
CHF 300,000 on Fast Solvers in Large-Scale Parallel Electromagnetic Simulations, PI: O. Schenk (Univ. of Basel)
- 2007 **Industry – IBM** **University of Basel**
\$ 40,000 on IBM Faculty Award for High Performance Biomedical Simulations on the Cell Processor, PI: O. Schenk (Univ. of Basel)
- 2007 **Industry – IBM** **University of Basel**
\$ 3,000 on SUR Grant for HPC Cell BE Processor Cluster, PI: O. Schenk (Univ. of Basel)
- 2007-2009 **Swiss Commission for Technology and Innovation** **University of Basel**
CHF 474,000 on Computational Business Intelligence for Automotive Production Lines, PI: H. Burkhart (Univ. of Basel), Co-PI: O. Schenk (Univ. of Basel)
- 2005-2009 **Industry – Intel** **University of Basel**
\$ 270,000 on Research Fellowship Grant, PI: O. Schenk (Univ. of Basel)
- 2003-2004 **ETH Zurich Strategic Excellence Projects** **University of Basel**
CHF 494,000 (Univ. of Basel: CHF 0,000) on Large-Scale Eigenvalue Problems in Optoelectronic Semiconductor Lasers and Accelerator Cavities, PI: P. Arbenz (ETHZ), Co-PI: O. Schenk (Univ. of Basel), et.al.
- 2003-2004 **Industry – Intel** **University of Basel**
\$ 140,000 on Sparse Solution Methods for Intel's Math Kernel Library, PI: O. Schenk (Univ. of Basel)
- 2003-2004 **Industry – Integrated Systems Engineering AG** **University of Basel**
\$ 50,000 on Recent Advances in Sparse Linear Solver Technology for Semiconductor Device Simulations Matrices, PI: O. Schenk (Univ. of Basel)
- 2003 **Industry – ZEISS** **University of Basel**
CHF 5,000 on Consulting in the area of Numerical Methods for Optoelectronic Simulations, PI: O. Schenk (Univ. of Basel)
- 2002-2003 **Swiss Commission for Technology and Innovation** **University of Basel**
CHF 378,000 on Multilevel Peconditioning Techniques for Automobile Finite-Element Simulations, PI: H. Burkhart (Univ. of Basel), Co-PI: O. Schenk (Univ. of Basel)
- 2002 **Industry – IBM** **University of Basel**
\$ 16,000 on IBM Academic Visiting Fellowship, PI: O. Schenk (Univ. of Basel)
- 2000 **Industry – NEC** **ETH Zurich**
CHF 50,000 on Parallel Direct Solution of Large Linear Equation Systems, PI: O. Schenk (ETH Zurich)
- 2000 **Industry – INPRO** **ETH Zurich**
CHF 50,000 on Solution Techniques for Sparse Matrices from Sheet Metal Forming Simulations, PI: O. Schenk (ETH Zurich)
- 2000 **Industry – COMPAQ** **ETH Zurich**
CHF 50,000 on Integration of PARDISO into COMPAQ's Extended Mathematical Library CXML., PI: O. Schenk (ETH Zurich)

External Computing Resources

- 2016 **IT4Innovatios Directors Discretion** **Università della Svizzera italiana**
100K CPU h. on PRACE petaflop machine ("Anselm") on Computational Methods for Solving Stochastic Equilibrium Models, PI: O. Schenk (USI), Co-PI: S. Scheidegger (Uni Zurich)
- 2014 **DOE INCITE** **Università della Svizzera italiana**
100M CPU h. on DOE petaflop machine CRAY XK7 ("Titan") on Global Seismic Tomography Based on Spectral-Element and Adjoint Method, PI: J. Tromp (Princeton), Co-PI: O. Schenk (USI)
- 2013 **DOE INCITE** **Università della Svizzera italiana**
100M CPU h. on DOE petaflop machine CRAY XK7 ("Titan") on Global Seismic Tomography Based on Spectral-Element and Adjoint Method, PI: J. Tromp (Princeton), Co-PI: O. Schenk (USI)
- 2014 **Director's Discretion project** **Università della Svizzera italiana**
2M CPU h. on DOE petaflop machine CRAY XK7 ("Titan") on Real-time Stochastic Optimization of Complex Energy Systems on High Performance Computers, PI: O. Schenk (USI)

Teaching Experience

Taught 5 undergraduate courses, 17 graduate courses, 1 tutorial, and (co)organized 3 CSCS-USI summer schools on HPC; **since 2012 (start at USI)**: taught 6 undergraduate courses, 10 graduate courses, and (co)organized 4 CSCS-USI summer schools on Simulations and HPC. Detailed evaluations can be obtained upon request.

- Spring 2016 **Software Atelier: Supercomputing and Simulations** **Università della Svizzera italiana**
5 MSc students (evaluation grade: 9.67 out of max. of 10)
- Spring 2016 **CSCS-USI Summer School on Effective HPC** **Università della Svizzera italiana/CSCS**
≈ 30 MSc and PhD students (evaluation grade: 4.8 out of max. of 5).
- Fall 2015 **Numerical Computing** **Università della Svizzera italiana**
12 BSc students (evaluation grade: 9.2 out of max. of 10)
- Fall 2015 **High-Performance Computing** **Università della Svizzera italiana**
7 MSc students (evaluation grade: 9.0 out of max. of 10)
- Spring 2015 **CSCS-USI Summer School on Effective HPC** **Università della Svizzera italiana/CSCS**
≈ 30 MSc and PhD students (evaluation grade: 4.8 out of max. of 5). Video available at <http://youtu.be/3enmB6hzBGM> (produced by Multimedia Services of ETH Zurich)
- Spring 2015 **Software Atelier: Supercomputing and Simulations** **Università della Svizzera italiana**
6 MSc students (evaluation grade: 8.9 out of max. of 10)
- Spring 2015 **Introduction to Computational Science** **Università della Svizzera italiana**
26 BSc students (evaluation grade: 7.6 out of max. 10)
- Fall 2014 **High-Performance Computing** **Università della Svizzera italiana**
7 MSc students (evaluation grade: 10.0 out of max. of 10)
- Fall 2014 **Numerical Computing** **Università della Svizzera italiana**
2 BSc students (evaluation grade: 9.5 out of max. 10)

- Spring 2014 **Special Topics in Mathematics&Computational Science** **Università della Svizzera italiana**
7 MSc students (evaluation grade: 9.0 out of max. of 10)
- Spring 2014 **Parallel and Distributed Computing Lab** **Università della Svizzera italiana**
7 MSc students (evaluation grade: 9.0 out of max. of 10)
- Spring 2014 **Computational Science** **Università della Svizzera italiana**
≈ 20 BSc students, (evaluation grade: 7.1 out of max. of 10)
- Spring 2014 **CSCS-USI Summer School on Effective HPC** **Università della Svizzera italiana/CSCS**
30 MSc and PhD students (evaluation grade: 4.2 out of max. of 5)
- Fall 2013 **Parallel and Distributed Computing** **Università della Svizzera italiana**
cotaught with W. Binder & F. Pedone, ≈ 40 MSc students (evaluation grade: 8.1 out of max. of 10)
- Spring 2013 **Special Topics in Mathematics&Computational Science** **Università della Svizzera italiana**
6 MSc students (evaluation grade: —)
- Spring 2013 **Parallel and Distributed Computing Lab** **Università della Svizzera italiana**
7 MSc students (evaluation grade: —)
- Spring 2013 **Computational Science** **Università della Svizzera italiana**
≈ 20 BSc students (evaluation grade: 6.7 out of max. of 10)
- Spring 2013 **CSCS-USI Summer School on Effective HPC** **Università della Svizzera italiana/CSCS**
30 MSc and PhD students grade: (4.1 out of max. of 5)
- Fall 2012 **Parallel and Distributed Computing** **Università della Svizzera italiana**
cotaught with F. Pedone, ≈ 52 MSc students (evaluation grade: 7.2 out of max. of 10)
- Spring 2011 **High Performance Computing** **University of Basel**
cotaught with H. Burkhart, ≈ 15 MSc students
- Spring 2010 **High Performance Computing** **University of Basel**
cotaught with H. Burkhart, ≈ 15 MSc students
- Spring 2009 **High Performance Computing** **University of Basel**
cotaught with H. Burkhart, ≈ 15 MSc students
- Spring 2008 **High Performance Computing** **University of Basel**
cotaught with H. Burkhart, ≈ 20 MSc students
- Spring 2008 **Programming Cell Processors and GPUs for High-Performance SimulationsPDCN 2008**
cotaught with Matthias Christen, ≈ 25 participants
- Spring 2007 **High Performance Computing** **University of Basel**
cotaught with H. Burkhart, ≈ 15 MSc students
- Fall 2006 **Seminar Life Science Informatics** **University of Basel**
cotaught with H. Burkhart, F. Baty ≈ 10 MSc students
- Fall 2006 **Seminar Parallelismus** **University of Basel**
cotaught with H. Burkhart ≈ 10 MSc students
- Spring 2005 **Programmieren II** **University of Basel**
≈ 20 BSc students

≈ 15 MSc students

Advising and Mentoring

I advise(d) 4 Postdocs, 8 PhD students, 13 MSc students, 3 BSc students, and serve(d) on the committee of 4 PhD students (external member) and 8 PhD students (internal member).

Postdoctoral Research Assistants**Università della Svizzera italiana**

Simplice Donfack (April 2014 – December 2015); first job: INRIA, Paris.

Drosos Kourounis (January 2012 – present)

Patrick Sanan (May 2014 – present)

Matthias Christen (January 2013 – December 2015); first job: Vanamco, Zurich.

PhD students**Università della Svizzera italiana**

Radim Janalik (September 2015 – present, former Erasmus student at USI)

Juraj Kardos (September 2015 – present, former Erasmus student at USI)

Fabio Verbosio (April 2014 – present)

Dmitry Mikushin (May 2012 – present)

Max Rietmann (PhD 2015); first job: ETH Zurich, Switzerland.

PhD students**University of Basel**

Johannes Huber (PhD 2013), coadvised with M. Grote; first job: SAFEmine, Switzerland.

Madan Sathe (PhD 2012); first job: Ernst & Young Consulting, Switzerland.

Matthias Christen (PhD 2011), coadvised with H. Burkhart; first job: Università della Svizzera italiana, Switzerland.

PhD students (internal committee member)**Università della Svizzera italiana**

Igor Kaitovic (PhD, in progress)

Dmitri Makarov (PhD, in progress)

Kirill Lykov (PhD, in progress)

Dimitri Igdalov (PhD, in progress)

Marijn Stollenga (PhD, 2016)

Daniele Sciascia (PhD 2015)

Lea Conen (PhD 2015)

Johannes Steiner (PhD 2014)

Marco Favino (PhD 2014)

Sebastian Schmitz (PhD 2014)

PhD students (external committee member)

Mauro Calderara (PhD 2016), ETH Zurich, Switzerland.

Pierre Jolivet (PhD 2014), Université de Grenoble & Université Pierre et Marie Curie, France.

Long Qu (PhD 2014), Université Paris Sud, Orsay, France.

Johannes Langguth (PhD 2011), University of Bergen, Norway.

MSc students**Università della Svizzera italiana**

Edoardo Vecchi (MSc 2016, grade: 8.0)

Toby Simpson (MSc, start 09/2015)

Aryan Eftekhari (MSc 2016, grade: 10.0)

Radim Janalik (MSc 2015, with Brno University, former Erasmus student at USI, grade: 10.0)

MSc students

University of Basel

Dominique Meyer (MSc 2010), coadvised with M. Grote

Bernhard Egger (MSc 2009)

Matyas Filep (MSc 2008), coadvised with M. Grote

Eric Kreuzer (MSc 2007)

Roman Baier (MSc 2007)

Michael Martinec (MSc 2007)

Johannes Mittmann (MSc 2004), coadvised with M. Grote

Christian Schenk (MSc 2003)

Elisa Müller (MSc 2002)

BSc students

Università della Svizzera italiana

Simon Hrabec (BSc, start 09/2016), with Czech Technical University (Prague), former Erasmus student at USI

Soleimani Bidhendi Hanieh (BSc, grade: 9.0)

Simone Raimondi (BSc 2015, grade: 10.0)

MSc students (internal committee member)

Università della Svizzera italiana

Alena Kopanicakova (MSc 2015)

Service

Current Leadership Service

Committee Chair **SIAM SIAG/SC Best Paper Prize, 2016**, Committee Chair for the SIAM Activity Group on Supercomputing (SIAG/SC) Best Paper Prize

SIAG/SC **SIAM Activity Group on Supercomputing, 2016-2017**, Program Director SIAM SIAG on Supercomputing

SIAM PP18 **SIAM Conference on Parallel Processing for Scientific Computing, 2018**, Organizing Committee Co-Chairs

ACM PASC **ACM Platform for Advanced Scientific Computing Conference Series**, Steering Committee & Organizing Committee Co-Chairs

PMAA **International Workshop Series on Parallel Matrix Algorithms and Applications**, Steering Committee

Former Leadership Service

SPEEDUP **The Speedup Society: The Swiss Forum for High-Performance Computing**, Vice-president (2008-2015)

SIAM PP16 **SIAM Conference on Parallel Processing for Scientific Computing, 2016**, Organizing Committee

IEEE CSE 2015 **IEEE International Conference on Computational Science and Engineering, 2015**, Chair for the conference track on "Scientific and Engineering Computing"

Award Committee Service

SIAG/SC 2016 **Chair SIAM SIAG/Supercomputing Award Committee.** The SIAG/SC Best Paper Prize is awarded biennially to authors of the most outstanding paper, as determined by the prize committee, making significant contributions in the field of parallel scientific and engineering computing.

Advisory Service

2016 **Proposal Reviewer** **ETH Grant, ETH Zurich, Switzerland**
Research proposal on Partial differential Solvers for Fluid Simulations asking for CHF 240.000.

Prof. Dr. sc. techn. Olaf Schenk, Via Marco Da Carona 6 – CH-6900 Lugano

☎ +41 793682281 • ✉ olaf.schenk@usi.ch • 🌐 <http://www.ics.inf.usi.ch>

18/21

- 2016 **Proposal Reviewer** **Industrial Research Fund KU Leuven, Belgium**
 Research proposal on Large-Scale Numerical Computing to the Research Foundation of KU Leuven asking for \$ 1400.000.
- 2014 **Proposal Reviewer** **Research Foundation Flanders, Belgium**
 Postdoctoral Fellow application to the Research Foundation Flanders asking for \$ 400.000 per proposal.
- 2013 **Proposal Reviewer** **French National Research Agency, France**
 Evaluation Committee of the MN program of the French National Research Agency asking for \$ 600.000 per proposal.
- 2013 **Proposal Reviewer** **Czech Science Foundation, Czech Republic**
 Evaluation Committee for individual projects of the Czech Science Foundation.
- 2012 **Proposal Reviewer** **French National Research Agency, France**
 Evaluation Committee of the MN program of the French National Research Agency asking for \$ 600.000 per proposal.
- Faculty Service**
- 2015-2016 **Promotion Committee Member** **Università della Svizzera italiana**
 Member of a faculty committee for a promotion process from assistant professor to senior assistant professor.
- 2014–present **Master Director** **Università della Svizzera italiana**
 Director of the Computational Science Master program at USI.
- 2013–present **Swiss Competence Center on Energy Research** **Università della Svizzera italiana**
 I am serving as a faculty representative on the project board of the SCCER Future Swiss Electrical Infrastructure (FURIES) project which joins the competencies of the several Swiss academic and industrial actors in the area of power and energy systems.
- 2012-present **USI–CSCS** **Università della Svizzera italiana**
 I am serving as a faculty contact person to the Swiss Center of Supercomputing (CSCS).
- 2012-present **PhD Prospectus Committee Member** **Università della Svizzera italiana**
 I am serving on a regular basis on evaluation committees of PhD, MSc, and BSc students.
- 2014 **Exhibition Organizing Committee Member** **Università della Svizzera italiana**
 Member of a faculty committee of the 10 year informatic anniversary exhibition, responsible for the computational science booth.
- 2008 **Promotion committee member** **University of Basel**
 Member of a faculty committee for a faculty position on Biomedical Data Analysis (level: associate professor).
- 2004-2011 **Committee member** **University of Basel**
 Member of a faculty committee for a new BSc program on Computational Science.
- Journal Editorial Board**
- 2012-present **Associate Editor** **SIAM SISC**
 The SIAM Journal on Scientific Computing contains research articles on numerical methods and techniques for scientific computation.
- 2016 **Guest Editor** **PARCO**
 Parallel Computing is an international journal presenting the practical use of parallel computer systems, including high performance architecture, system software, programming systems and tools, and applications.

2014 **Guest Editor** **PARCO**
Parallel Computing is an international journal presenting the practical use of parallel computer systems, including high performance architecture, system software, programming systems and tools, and applications.

2012 **Guest Editor** **PARCO**
Parallel Computing is an international journal presenting the practical use of parallel computer systems, including high performance architecture, system software, programming systems and tools, and applications.

2004 **Guest Editor** **JFGCS**
Future Generation Computer Systems is an international journal with a focus on new theory and technological progress supporting a better understanding of wide-area, fully distributed computing systems.

Technical Program Committee Member (alphabetically)

- CENG **International Symposium on Computer and Information Sciences**, 2010
- DAGSTUHL **Dagstuhl Seminars**, 2009, 2015
- DD **International Conference on Domain Decomposition Methods**, 2013
- ECT **International Conference on Engineering Computational Technology**, 2006, 2008, 2010, 2012
- FMC **Facing the Multicore-Challenge Conference**, 2010, 2011, 2012
- HipHaC **New Frontiers in High-performance and Hardware-aware Computing**, 2011
- HiStencils **International Workshop on High-Performance Stencil Computations**, 2014
- HiPC **IEEE International Conference on High Performance Computing**, 2007, 2008, 2013, 2015
- HPCS **International Conference on High Performance Computing & Simulation**, 2014
- ICPP **IEEE International Conference on Parallel Processing**, 2013
- IHPCES **International Workshop on Advances in High-Performance Computational Earth Sciences: Applications and Frameworks**, 2013, 2014, 2016
- IPDPS **IEEE International Parallel & Distributed Processing Symposium**, 2010, 2014, 2016
- ISC **International Supercomputing Conference**, 2017
- PASC **Platform for Advanced Scientific Computing Conference Series**, 2014, 2015, 2016
- PDCN **International Conference on Parallel and Distributed Computing and Networks**, 2011
- PMAA **International Workshop on Parallel Matrix Algorithms and Applications**, 2008, 2010, 2012, 2014
- PPAM **International Conference on Parallel Processing and Applied Mathematics**, 2013, 2015
- PPAA **International Workshop on Parallel Programming for Analytics Applications**, 2016
- SBAC-PAD **International Symposium on Computer Architecture and High Performance Computing**, 2009, 2016
- SC **ACM/IEEE Conference on High Performance Computing, Networking, Storage and Analysis**, 2008, 2010, 2013, 2014, 2015, 2016
- SPEEDUP **Speedup Workshops on High-Performance Computing**, 2003, 2006, 2007, 2008, 2009, 2010, 2011, 2012, 2013, 2014, 2015

Scientific Journal Reviewer

- ACM TOMS **ACM Transactions on Mathematical Software**, 2006, 2008, 2009, 2010, 2014
SIMAX **SIAM Journal on Matrix Analysis and Applications**, 2006, 2008, 2009, 2010, 2014
SISC **SIAM Journal on Scientific Computing**, 2007, 2008, 2009, 2010, 2014, 2015
SIOPT **SIAM Journal on Optimization**, 2010
IJHPC **International Journal of High Performance Computing**, 2010
JCOA **Journal of Computational Optimization and Applications**, 2010
JCP **Journal of Computational Physics**, 2006
ETNA **Electronic Transactions of Numerical Analysis**, 2005
JFGCS **Journal of Future Generation Computer Systems**, 2005, 2008, 2009
PARCO **Journal of Parallel Computing**, 2003, 2004, 2005, 2006
IEEE TPDS **IEEE Transactions on Parallel and Distributed Computing**, 2008, 2009, 2010
IEEE TCAD **IEEE Transactions on Computer-Aided Design of Integrated Circuits and Systems**, 2005
IEEE PCDS **IEEE Proceedings - Circuits, Devices and Systems**, 2003
COMP. STRUC **Journal Computer & Structures**, 2005, 2006
JCCPE **Journal Concurrency and Computation: Practice and Experience**, 2011, 2012

Professional Organizations

- IEEE and IEEE Computer Society**, Senior Member
Association for Computing Machinery (ACM), Member
ACM Special Interest Group on High Performance Computing (ACM SIGHPC), Member
Society for Industrial and Applied Mathematics (SIAM), Member

Research Visits (> one week)

(not counting normal conference or workshop attendance)

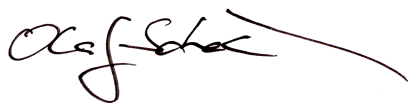
- Center of Computational Science, University of Tokyo, Tokyo, Japan** 2016
Center of Advanced Study in Theoretical Sciences (CASTS), Taipei, Taiwan, 2015
IBM Thomas Watson Research Center, USA, 2002, 2003, 2007, 2009, 2010, 2011
IBM Research Lab Austin, USA, 2008
Center of Scientific Computing, University of Warwick, UK, 2008, 2009
Department of Computer Science, University of British Columbia, Vancouver, CA, 2006, 2007, 2008, 2015
Weierstrass-Institute of Applied Analysis and Stochastic, Berlin, Germany, 2004, 2007, 2010
Argonne National Lab, USA, 2008, 2012
Purdue University, USA, 2009, 2010, 2011
Academy of Sciences, Department of Computer Science, Prague, CZ, 2004
Stanford University, USA, 2010
NVIDIA Research, USA, 2010
Banff International Research Station of Mathematical Innovation, Canada, 2009

Intel Research Lab Oregon, USA, 2008

ZIB Berlin, Germany, 2007

KTH Stockholm, Sweden, 2006

TU Berlin, Germany, 2006

A handwritten signature in black ink, appearing to read 'Olaf Schenk', with a long horizontal flourish extending to the right.

Olaf Schenk