Torsten Hoefler

Full Professor of Computer Science, Swiss Federal Institute of Technology (ETH Zürich) and
Chief Architect for Machine Learning, Swiss National Supercomputing Center (CSCS)

Education

2005–2008 **Ph.D., Computer Science (Dr. rer. nat.)** — **Indiana University**
GPA: 4.0/4.0 ("summa cum laude") — **Bloomington, IN, USA**
Committee: Andrew Lumsdaine, Randall Bramley, Jack Dongarra, Richard Graham, Minaxi Gupta
IU Young Alumni Award 2014 and **Luddy Distinguished Alumni Award 2022**

2000–2004 **Diplom, Informatik (Master of CS)** — **Chemnitz University of Technology**
Grade: sehr gut ("very good") — **Chemnitz, Germany**
Universitätspreis 2005 (best student in class), Advisor: Wolfgang Rehm

1993–1999 **Gymnasium (Academic High School)** — **Gymnasium Oelsnitz**
Graduated top of class (3^{rd} best among 90 students) — **Oelsnitz, Germany**

Research Interests

My research interests revolve around the central topic of "Performance as a Science" in the context of High-Performance Computing (HPC) and Large-Scale Artificial Intelligence (AI). There are three main sub-branches in my work: (1) **high-performance parallel programming**, (2) **high-performance networking**, and (3) **climate simulations and AI training**.

Awards and Honors (personal career awards underlined)

2025 **ACM Prize in Computing (2024)** — **San Francisco, CA, USA**
"recognizes an early to mid-career fundamental innovative contribution in computing that, through its depth, impact, and broad implications, exemplifies the greatest achievements in the discipline." It is second only to the Turing award in the field of computing. Recipients are invited to participate in the Heidelberg Laureate Forum alongside with Turing Award recipients and Nobel Laureates $250.000

2025 **Ultra Ethernet Consortium Visionary Leadership Award** — **Denver, CO, USA**
"Celebrating leaders who have driven strategic direction and progress" of the Ultra Ethernet specification

2024 **Max Planck-Humboldt Medal** — **Berlin, Germany**
among "the most prestigious German award[s] to internationally outstanding mid-career scientists, funded by the German Federal Ministry of Education and Research and jointly awarded by the Alexander von Humboldt Foundation and the Max Planck Society", across all sciences for "for groundbreaking research in the field of computer science [...] to increase the efficiency of computer systems by up to a thousand-fold [.. and ..] substantial contribution to the advancement of artificial intelligence" €60,000

2024 **Best Paper Award at SC24** — **Atlanta, GA, USA**
best technical paper at ACM/IEEE Supercomputing 2024; selected by a committee during the conference out of a set of six finalists (out of 470 submissions), $1,000

2024 **Best Poster Award at SC24** — **Atlanta, GA, USA**
best technical poster at ACM/IEEE Supercomputing 2024; selected by a committee during the conference out of a set of six finalists

2024 **ELLIS Fellow, class of 2024** — **Zurich, Switzerland**
"ELLIS Fellows [...] are leading scientists in the European ML/AI community who advance science, and also act as ambassadors of ELLIS, thus giving a voice to data-driven AI research in Europe."

2023 **Best Student Paper Award at SC23** — **Denver, CO, USA**
best technical student paper at ACM/IEEE Supercomputing 2023; selected by a committee during the conference out of a set of four finalists (out of 376 submissions), $1,000

2023 **Best Reproducibility Advancement Award at SC23** — **Denver, CO, USA**
best paper in terms of reproducibility at ACM/IEEE Supercomputing 2023; selected by a committee from all 90 accepted papers), $300

Universitätsstrasse 6 – 8092 Zürich
✉ *htor@inf.ethz.ch* ▪ *http://htor.inf.ethz.ch/*

2023 **Jack Dongarra Early Career Award** **Hamburg, Germany**
"... to an upcoming researcher [...], who has been a catalyst for scientific progress through exceptional work in their field.", inaugural award at the 2023 International Supercomputing Conference, €5,000

2023 **ACM Fellow, class of 2022** **New York, NY, USA**
"The ACM Fellows program recognizes the top 1% of ACM Members"; **citation:** "for foundational contributions to High-Performance Computing and the application of HPC techniques to machine learning"

2023 **Who is Who in Zurich** **Zurich, Switzerland**
"The 200 most prominent persons in Zurich and Basel." (population of ≈2M in the metro areas)

2022 **IEEE CS Sidney Fernbach Award** **Los Alamitos, CA, USA**
"Established in 1992 in memory of high-performance computing pioneer Sidney Fernbach, the Sidney Fernbach Memorial Award recognizes outstanding contributions in the application of high-performance computers using innovative approaches." (oldest and one of the most significant career awards in HPC)

2022 **Best Paper Award at SC22** **Dallas, TX, USA**
best technical paper at ACM/IEEE Supercomputing 2022; selected by a committee during the conference out of a set of seven finalists (out of 320 submissions), $1,000

2022 **Best Reproducibility Advancement Award at SC22** **Dallas, TX, USA**
best paper in terms of reproducibility at ACM/IEEE Supercomputing 2022; selected by a committee during the conference out of a set of two finalists (out of 320 submissions), $300

2022 **Luddy Distinguished Alumni Award**, *IU Luddy School of Informatics* **Indianapolis, IN, USA**
"The Luddy Distinguished Alumni Award recognizes outstanding contributions to computer science, informatics, and engineering over the course of a career [...]" (the school had ≈1,800 students)

2022 **IEEE Fellow, class of 2021** **Zurich, Switzerland**
"following a rigorous evaluation procedure, the IEEE Fellow Committee recommends a select group of recipients for elevation to IEEE Fellow. Less than 0.1% of voting members are selected annually."

2022 **SIGHPC Certificate of Appreciation** **Dallas, TX, USA**
As recognition for reproducible methods in and as an SC22 student cluster competition task. A single paper selected from SC21's proceedings out of 98 papers that appeared at the conference.

2021 **HPCWire Person to Watch** **San Diego, USA**
"You have been selected for [...] the impact you will have on the HPC community and ecosystem globally. Your leadership [...] will shape not only the future of our industry but will make a difference for the quality of life on our planet today and generations to come."

2021 **Distinguished Paper Award at ACM OOPSLA'21** **Chicago, USA**
designated as distinguished paper of the ACM Symposium on Object-oriented Programming, Systems, Languages, and Applications (six out of 71 accepted papers)

2020 **ERC Consolidator Grant** **Brussels, Europe**
"ERC Consolidator Grants are awarded to outstanding researchers [... with ...] a scientific track record showing great promise and an excellent research proposal." (13% acceptance). EUR 2M

2020 **BenchCouncil Rising Star Award** **Qingdao, China**
"The BenchCouncil Rising Star Award is given to a young scholar who has made outstanding contributions to the field of benchmarking, measurement and optimization. The winner of this award will be automatically elected as a Senior Member of the ISTC [...]." ($1000 award and keynote at the Bench'20 conference, digitally due to COVID-19)

2019 **ACM Gordon Bell Prize** **Denver, CO, USA**
"[...] recognize outstanding achievement in high-performance computing. The purpose of the award is to track the progress over time of parallel computing, with particular emphasis on rewarding innovation in applying high-performance computing to applications in science, engineering, and large-scale data analytics." awarded in the categories *"Sustained Application Performance"* and *"Novelty of Programming Approach", $10,000*

2019 **Best Student Paper Award at SC19** **Denver, CO, USA**
advisor on the best student paper at ACM/IEEE Supercomputing 2019; selected by a committee during the conference out of a set of twelve candidates (out of 387 submissions), $1,000

2019 **IEEE TCSC Award for Excellence in Scalable Computing (MCR)** **Zhangjiajie, China**
"for contributions on all aspects of large-scale scalable parallel processing systems and supercomputers"

2017 **Student Teaching Award "Best Interaction"** **Zurich, Switzerland**
elected democratically by all computer science students

2017 **Best Student Paper Award at IEEE HOTI'17** **Santa Clara, CA, USA**
collaborator on the best student paper at IEEE Hot Interconnects 2017, $250

2016 **Outstanding Paper Award at ACM OOPSLA'16** **Amsterdam, Netherlands**
designated as outstanding paper of the ACM Symposium on Object-oriented Programming, Systems, Languages, and Applications (four out of 52 accepted papers (203 submissions))

2016 **Best Student Paper Award at IEEE HOTI'16** **Santa Clara, CA, USA**
advisor on the best student paper at IEEE Hot Interconnects 2016, $250

2016 **Karsten Schwan Best Paper Award at ACM HPDC'16** **Kyoto, Japan**
designated as best paper of the ACM Symposium on High-Performance Parallel and Distributed Computing (out of 20 accepted papers (129 submissions))

2015 **Latsis Prize of ETH Zürich** **Zürich, Switzerland**
"The purpose of the Latsis Prize is to recognize and reward scientific work of particular excellence from all fields of research undertaken at the ETH Zurich" (one award per year to one scientist across all disciplines), CHF 25,000

2015 **ERC Starting Grant** **Brussels, Europe**
"ERC Starting Grants aim to support up-and-coming research leaders who are about to establish a proper research team and to start conducting independent research [...] " (8% acceptance). EUR 1.5M

2015 **Best Student Paper Award at IEEE HOTI'15** **Santa Clara, CA, USA**
advisor on the best student paper at IEEE Hot Interconnects 2015, $250

2015 **Best Paper Award at ACM HPDC'15** **Portland, OR, USA**
designated as best paper of the ACM Symposium on High-Performance Parallel and Distributed Computing (out of 19 accepted papers (116 submissions))

2015 **Best Paper Award at IEEE Intl. Parallel & Distr. Processing Symposium** **Hyderabad, India**
designated as best paper of the software track at IPDPS'15 (four tracks, one award each, plenary presentation, of 108 accepted papers (496 submissions))

2014 **Best Student Paper Award at SC14** **New Orleans, LA, USA**
advisor on the best student paper at ACM/IEEE Supercomputing 2014; selected by a committee during the conference out of a set of seven finalists (out of 394 submissions), $1,000

2014 **Young Alumni Award**, *Indiana University School of Informatics* **Indianapolis, IN, USA**
"in recognition of outstanding early career achievement that brings acclaim and recognition to the field of informatics, and honor and distinction to Indiana University." (the school had ≈1,800 students)

2013 **Best Paper Award at SC13** **Denver, CO, USA**
designated as best paper at ACM/IEEE Supercomputing 2013; selected by a committee during the conference out of a set of thirteen finalists (out of 457 submissions)

2013 **IEEE TCSC Young Achiever in Scalable Computing** **Denver, CO, USA**
"Awarded to individuals who have made outstanding, influential, and potentially long-lasting contributions in the field of scalable computing within 5 years of receiving their PhD."

2013 **IBM Faculty Award** **Yorktown Heights, NY, 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.", $30,000

2013 **Best Paper Award at EuroMPI'13** **Madrid, Spain**
designated as best paper of EuroMPI 2013 after a two-round review process, ≈$3,400 gift

2012 **SIAM SIAG/SC Junior Scientist Prize** **Savannah, GA, USA**
"awarded to an outstanding junior researcher in the field of algorithms research and development for parallel scientific and engineering computing", ≈$2,000 travel funds

2011 **Best Poster Award PPoPP'11** **San Antonio, TX, USA**
designated as best poster at the 2011 ACM SIGPLAN Symposium on Principles and Practice of Parallel Programming; selected by a committee during the poster session.

2010 **Best Paper Award at SC10** **New Orleans, LA, USA**
designated as best paper at ACM/IEEE Supercomputing 2010; selected by a committee during the conference out of a set of nine finalists (out of 257 submissions) $1,000

2010 **Best Paper Award LSAP'10** **Chicago, IL, USA**
designated as best paper at the 2010 ACM Workshop on Large-Scale System and Application Performance; selected by a committee

2009 **Best Paper Award LCI'09** **Boulder, CO, USA**
best student paper at the Linux Cluster Institute Conference 2009; selected by a committee; $500

2008 **Cluster Challenge Champion SC'08** **Austin, TX, USA**
co-advised the winning team at IEEE/ACM SC08's Cluster Challenge; a competition involving seven international teams of undergraduate students running HPC applications on a self-made cluster computer

2008 **Travel Award CCGrid'08** **Lyon, France**
IEEE/TCSC Doctoral Symposium for Cluster Computing and the Grid 2008, $2,000

2005 **State Fellowship for Doctoral Studies** **Chemnitz, Germany**
Saxon Ministry of Science and the Fine Arts (Sächsisches Ministerium für Wissenschaft und Kunst), one of four reputable fellowships at TU Chemnitz, €1,400/month; extension declined after one year.

2005 **Universitätspreis 2005 (Best Student Award)** **Chemnitz, Germany**
Chemnitz University of Technology, €2,000

2005 **GI/PARS Nachwuchspreis 2005 (PARS Junior Researcher Award)** **Lübeck, Germany**
Group of Parallel Algorithms, Computer Architectures and System Software in the German Computer Society (Gesellschaft für Informatik, GI), €500

2005 **HPC Europa, Scientific Highlight** **Caseleccio di Reno, Italy**
Selected as outstanding visitor of the HPC Europe scientific exchange program.

Awards of Mentees (received while being mentored)

2024 **HiPEAC Tech Transfer** **Barcelona, Spain**
Maciej Besta received the HiPEAC Tech Transfer Award for Graph of Thoughts

2024 **HiPEAC Tech Transfer** **Barcelona, Spain**
Lukas Truemper received the HiPEAC Tech Transfer Award for Daisytuner

2024 **IEEE CS TCHPC** **Atlanta, GA, USA**
Maciej Besta received the IEEE CS TCHPC Early Career Award

2024 **ISC'24 Cluster Competition** **Hamburg, Germany**
ETH's Cluster Challenge Team won the Third Prize overall

2023 **SC23 Cluster Competition** **Denver, CO, USA**
ETH's Cluster Challenge Team won the Overall Student Cluster Competition

2023 **Informatics Europe Best Dissertation Award** **Edinburgh, UK**
Salvatore Di Girolamo's dissertation was Informatics Europe Best Dissertation Award Runner Up

2023 **ISC'23 Cluster Competition** **Hamburg, Germany**
ETH's Cluster Challenge Team won the Highest Linpack Award and the Third Prize overall

2022 **SIGHPC Dissertation award** **Dallas, TX, USA**
Maciej Besta received the SIGHPC dissertation award for his PhD thesis under my supervision

2022 **ACM Student Research Competition** **Dallas, TX, USA**
Marcin Copik received the ACM SRC Gold Medal (graduate)

2022 **ACM-IEEE CS George Michael Memorial HPC Fellowship** **Dallas, TX, USA**
Marcin Copik received the prestigious ACM/IEEE-CS George Michael Memorial HPC Fellowship

2022 **ETH Medal for MSc Thesis** **Zurich, Switzerland**
Patrick Iff received the ETH Medal for his MSc thesis supervised by Maciej Besta and myself

2022 **ISC'22 Cluster Competition** **Hamburg, Germany**
ETH's Cluster Challenge Team won the Silver Medal

2022 **Kaivalya Dixit dissertation award (runner up)** **Beijing, China**
Maciej Besta received the Dixit award (runner up) for his PhD thesis under my supervision

2022 **ETH Medal for PhD Thesis** **Zurich, Switzerland**
Maciej Besta received the ETH Medal for his PhD thesis under my supervision

2020 **Xilinx Open Hardware Design Contest** **Virtual/COVID-19**
Johannes de Fine Licht won in the Compute Acceleration category

2020 **Xilinx Open Hardware Design Contest** **Virtual/COVID-19**
Manuel Burger won in the PhD Student Category

2019 **ACM Student Research Competition** **Denver, CO, USA**
Marcin Copik received the ACM SRC Gold Medal (graduate)

2019 **ISC'19 Cluster Competition** **Frankfurt, Germany**
ETH's Cluster Challenge Team won the highest Linpack and overall Bronze Medal (2/5 awards)

2018 **ACM Student Research Competition** **Dallas, TX, USA**
Salvatore Di Girolamo received the ACM SRC Bronze Medal (graduate)

2018 **SNSF Ambizione Fellowship** **Bern, Switzerland**
Tal Ben-Nun received the prestigious Ambizione Fellowhip to build a research group

2018 **ETH Medal for MSc Thesis** **Zurich, Switzerland**
Cedric Renggli received the ETH Medal for his MSc thesis under Dan Alistarh's and my supervision

2015 **ACM-IEEE CS George Michael Memorial HPC Fellowship** **Austin, TX, USA**
Maciej Besta received the prestigious ACM/IEEE-CS George Michael Memorial HPC Fellowship

2013 **ACM Student Research Competition** **Denver, CO, USA**
Robert Gerstenberger received the ACM SRC Bronze Medal (undergraduate)

2016 **SNSF Ambizione Fellowship** **Bern, Switzerland**
Tobias Grosser received the prestigious Ambizione Fellowhip to build a research group

Positions and Experience

2023–present **Chief Architect for Machine Learning** **Swiss National Supercomputing Center (CSCS)**
Design and architect the large-scale training and inference platform infrastructure for scientific machine learning at CSCS.

2020–present **Full Professor of Computer Science** **ETH Zürich**
Computer Science Department
I lead research on scalable parallel computing, advising PhD and Master students in the Scalable Parallel Computing Laboratory.

2020–present **Adjunct Professor of Electrical Engineering** **ETH Zürich**
Department of Information Technology and Electrical Engineering

2024–present **Member of Research Advisory Board** **Hamburg University**
advising the research strategy of one of Germany's largest universities

2024–present **Member of Steering Committee** **National Supercomputing Centre (NSCC) Singapore**
advising Singapore's NSCC as steering committee member

2017–2020 **Associate Professor (tenured) of Computer Science** **ETH Zürich**
Computer Science Department

2012–2017 **Assistant Professor (tenure track) of Computer Science** **ETH Zürich**
Computer Science Department

2010–2013 **Adjunct Assistant Professor of Computer Science** **University of Illinois**
Computer Science Department **Urbana-Champaign**
I led research in high-performance computing involving CS faculty members focused on topology mapping [ICS'11] and performance modeling [SC'11]. I taught two classes on High-Performance Computing.

2012 **Interim Technical Program Manager Applications** **University of Illinois**
Blue Waters Directorate, NCSA **Urbana-Champaign**
I led the Advanced Application and User Support Group, consisting of 11 domain specialists at Masters or Ph.D. level who provide advanced scientific computing support to a small number of expert users (≈40) of Blue Waters in their respective domains. Also certification of application and system performance milestones during installation and bringup of Blue Waters.

2010–2012 **Application and System Performance Modeling and Simulation Lead** **University of Illinois**
Blue Waters Directorate, NCSA **Urbana-Champaign**
I performed Modeling and Simulation of Sustained Petaflop Applications for Blue Waters, MPI Forum Activities. Scientific advisors: Marc Snir, Bill Gropp.

2008–2010 **Postdoctoral Fellow** **Indiana University**
Open Systems Lab **Bloomington, IN**
Parallel Programming, Modelling and Network Research, MPI Forum Activities
Scientific advisor: Andrew Lumsdaine.

2006–2008 **Research Assistant** **Indiana University**
Open Systems Lab **Bloomington, IN**
Parallel Computing and Networking Research

Jan 2007 **Visiting Researcher** **Commissariat à l'Ènergie Atomique**
Direction des Applications Militaires (CEA-DAM) **Bruyères-le-Châtel, France**
Parallel Quantum-Mechanical Computations with ABINIT

Dec 2005 **Visiting Researcher** **CINECA**
CINECA Consorzio Interuniversitario **Casalecchio di Reno, Italy**
Parallel Ab-Initio Quantum Mechanical Computations

2004–2006 **Research Assistant** **Chemnitz University of Technology**
Parallel Ab-Initio Quantum Mechanical Computations, Networking Research **Chemnitz, Germany**

Significant Leadership and Service Positions

2023–present **UEC Transport Working Group Co-chair** **Ultra Ethernet Consortium**
Elected Co-chair of the Ultra Ethernet Transport Working Group

2013–present **ACM SIGHPC Executive Committee (4th term)** **SIGHPC**
Elected member of all Executive Committees of ACM SIGHPC 2013-2025, Special Interest Group on High Performance Computing. I am the only individual who has been on all SIGHPC executive committees since its foundation. As one of two elected members-at-large, I co-represent the body of more than 1,000 members. I was (re-)elected in 2013, 2016, 2019, and 2022.

2014–2018 **Associate Editor (2 terms)** **IEEE TPDS**
IEEE Transactions on Parallel and Distributed Systems, I was re-appointed in 2016

2012–present **Associate Editor** **IJHPCA**
SAGE International Journal of High Performance Computing Applications

2010–present **MPI Forum WG Lead** **Message Passing Interface Forum**
I lead the MPI-3 Working Group for Collective Operations and Topology.

2013 **Expert in Resilience and Software Engineering** **EESI2**
Invited member of two working groups in the European Exascale Software Initiative 2 to *"provide recommendations on strategic European actions [...]"*

2014–2016 **Scientific Advisory Board** **Simula**
Simula Research Laboratory, Norway

2014–2018 **Scientific Advisory Board** **EPIGRAM Project**
Member of the SAB of the European Project for Exascale ProGRAmming Models (EPIGRAM)

Professional Memberships

ACM Fellow **Association of Computing Machinery**
IEEE Fellow **Institute of Electrical and Electronics Engineers**

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ELLIS Fellow **European Laboratory for Learning and Intelligent Systems**
Member Academia Europaea **European Academy of Sciences Academia Europaea**

Industry Experience and Significant Consulting

2023–today **Senior Fellow** **Abu Dhabi Investment Authority Labs**
Research advice in High-Performance Computing, Artificial Intelligence, and Climate topics.

2019 **Visiting Researcher (half year sabbatical)** **Microsoft, AI and Advanced Architecture Group**
Research and development of advanced AI and quantum architectures and systems.

2018 **Visiting Researcher (summer)** **Microsoft, Quantum Architecture Group**
Research and development of quantum architectures and systems.

2018 **Scientific Advisor** **Vulcan Inc., Seattle, WA**
External advisor to the late Paul Allan to help him select groups to fund a $500M Climate Code Modernization Initiative.

2018 **Consultant** **Cray Inc.**
Advising on advanced networking topics.

2017 **Visiting Researcher (summer)** **Microsoft Research, Quantum Architecture Group**
Research and development of quantum architectures and systems.

2000–2005 **Software Engineer** **DELTA proveris AG**
Design and Implementation of Database (Informix) and Web Applications (PHP/Perl)

Publications

Summary: 150 $A^{(*)}$ top conference, 36 journal papers, 500+ total papers, 21,000+ citations, h-index: 76 (Google Scholar) 36 papers were nominated as best (student) paper and **20 received best (student) paper awards**. See below for details. Full publication list available at http://htor.inf.ethz.ch/publications/

Selected Peer-reviewed Conference Publications

SC'24 Siyuan Shen, Langwen Huang, Marcin Chrapek, Timo Schneider, Jai Dayal, Manisha Gajbe, Robert Wisniewski, Torsten Hoefler:AMP: Assessing Network Latency Tolerance of HPC Applications with Linear Programming *In Proceedings of the International Conference for High Performance Computing, Networking, Storage and Analysis (SC'24), presented in Atlanta, GA, USA, pages 1004-1021, IEEE Press, ISBN: 979-8-3503-5291-7, Nov. 2024 (acceptance rate 21.1%, 99/470)* , ***SC'24 Best Paper Award (1/99)***

SC'24 Patrik Okanovic, Grzegorz Kwasniewski, Paolo Sylos Labini, Maciej Besta, Flavio Vella, Torsten Hoefler: High Performance Unstructured SpMM Computation Using Tensor Cores *In Proceedings of the International Conference for High Performance Computing, Networking, Storage and Analysis (SC'24), presented in Atlanta, GA, USA, pages 154:1-154:14, IEEE Press, ISBN: 979-8-3503-5291-7, Nov. 2024 (acceptance rate 21.1%, 99/470)*

EMNLP'24 Saleh Ashkboos, Ilia Markov, Elias Frantar, Tingxuan Zhong, Xincheng Wang, Jie Ren, Torsten Hoefler, Dan Alistarh: QUIK: Towards End-to-End 4-Bit Inference on Generative Large Language Models *In Proceedings of the 2024 Conference on Empirical Methods in Natural Language Processing (EMNLP'24), presented in Miami, FL, USA, pages 3355-3371, Association for Computational Linguistics, Nov. 2024*

TACO Andrea Lepori, Alexandru Calotoiu, Torsten Hoefler: Iterating Pointers: Enabling Static Analysis for Loop-based Pointers *ACM Transactions on Architecture and Code Optimization. Oct. 2024*

NeurIPS'24 Saleh Ashkboos, Amirkeivan Mohtashami, Maximilian L. Croci, Bo Li, Martin Jaggi, Dan Alistarh, Torsten Hoefler, James Hensman: QuaRot: Outlier-Free 4-Bit Inference in Rotated LLMs *In Proceedings of the Neural Information Processing Systems, presented in Vancouver, Canada, Dec. 2024*

ICML'24 Langwen Huang, Lukas Gianinazzi, Yuejiang Yu, Peter D. Dueben, Torsten Hoefler: DiffDA: a Diffusion model for weather-scale Data Assimilation *Jul. 2024*

USENIX ATC'24 Mikhail Khalilov, Marcin Chrapek, Siyuan Shen, Alessandro Vezzu, Thomas Benz, Salvatore Di Girolamo, Timo Schneider, Daniele De Sensi, Luca Benini, Torsten Hoefler: OSMOSIS: Enabling Multi-Tenancy in Datacenter SmartNICs *Jul. 2024 (acceptance rate 15.9%, 77/482)*

SPAA'24 Kartik Lakhotia, Laura Monroe, Kelly Isham, Maciej Besta, Nils Blach, Torsten Hoefler, Fabrizio Petrini: PolarStar: Expanding the Horizon of Diameter-3 Networks *In Proceedings of the 36th ACM Symposium on Parallelism in Algorithms and Architectures (SPAA'24), presented in Nantes, France, pages 345–357, Association for Computing Machinery, ISBN: 9798400704161, Jun. 2024 (acceptance rate 29.9%, 35/117)*

IPDPS'24 Yves Baumann, Tal Ben-Nun, Maciej Besta, Lukas Gianinazzi, Torsten Hoefler, Piotr Luczynski: Low-Depth Spatial Tree Algorithms *In Proceedings of the 38th IEEE International Parallel and Distributed Processing Symposium (IPDPS'24), presented in San Francisco, CA, USA, pages 180-192, IEEE Press, May 2024 (acceptance rate 26.1%, 88/337)*

IPDPS'24 Marcin Copik, Marcin Chrapek, Larissa Schmid, Alexandru Calotoiu, Torsten Hoefler: Software Resource Disaggregation for HPC with Serverless Computing *In Proceedings of the 38th IEEE International Parallel and Distributed Processing Symposium (IPDPS'24), presented in San Francisco, CA, USA, IEEE, May 2024*

ICLR'24 Saleh Ashkboos, Maximilian L. Croci, Marcelo Gennari do Nascimento, Torsten Hoefler, James Hensman: SliceGPT: Compress Large Language Models by Deleting Rows and Columns *In The Twelfth International Conference on Learning Representations, May 2024*

ICLR'24 Tim Dettmers, Ruslan A. Svirschevski, Vage Egiazarian, Denis Kuznedelev, Elias Frantar, Saleh Ashkboos, Alexander Borzunov, Torsten Hoefler, Dan Alistarh: SpQR: A Sparse-Quantized Representation for Near-Lossless LLM Weight Compression *In The Twelfth International Conference on Learning Representations, May 2024*

HPDC'24 Piotr Luczynski, Lukas Gianinazzi, Patrick Iff, Leighton Wilson, Daniele De Sensi, Torsten Hoefler: Near-Optimal Wafer-Scale Reduce *In Proceedings of the 33rd International Symposium on High-Performance Parallel and Distributed Computing (HPDC'24), presented in Pisa, Italy, Association for Computing Machinery, May 2024*

NSDI'24 Nils Blach, Maciej Besta, Daniele De Sensi, Jens Domke, Hussein Harake, Shigang Li, Patrick Iff, Marek Konieczny, Kartik Lakhotia, Ales Kubicek, Marcel Ferrari, Fabrizio Petrini, Torsten Hoefler: A High-Performance Design, Implementation, Deployment, and Evaluation of the Slim Fly Network *In 21st USENIX Symposium on Networked Systems Design and Implementation (NSDI '24), presented in Santa Clara, CA, USA, pages 1025-1044, USENIX Association, ISBN: 978-1-939133-39-7, Apr. 2024*

AAAI'24 Maciej Besta, Nils Blach, Ales Kubicek, Robert Gerstenberger, Michał Podstawski, Lukas Gianinazzi, Joanna Gajda, Tomasz Lehmann, Hubert Niewiadomski, Piotr Nyczyk, Torsten Hoefler: Graph of Thoughts: Solving Elaborate Problems with Large Language Models *Proceedings of the AAAI Conference on Artificial Intelligence. Vol 38, Nr. 16, presented in Vancouver, Canada, pages 17682-17690, AAAI Press, Mar. 2024 (acceptance rate 23.75%, 2342/9862)*

PPoPP'24 Lukas Gianinazzi, Alexandros Nikolaos Ziogas, Piotr Luczynski, Langwen Huang, Saleh Ashkboos, Florian Scheidl, Armon Carigiet, Chio Ge, Nabil Abubaker, Maciej Besta, Tal Ben-Nun, Torsten Hoefler: Arrow Matrix Decomposition: A Novel Approach for Communication-Efficient Sparse Matrix Multiplication *In The Proceedings of the 2024 USENIX Annual Technical Conference, presented in Edinburgh, United Kingdom, pages 404-416, Association for Computing Machinery, Mar. 2024*

Big Data'23 Wei Qiu, Marcin Copik, Yun Wang, Alexandru Calotoiu, Torsten Hoefler: User-guided Page Merging for Memory Deduplication in Serverless Systems *In 2023 IEEE International Conference on Big Data (Big Data), Dec. 2023 (acceptance rate 17.5%, 92/526)*

SC'23 Marcin Chrapek, Mikhail Khalilov, Torsten Hoefler: HEAR: Homomorphically Encrypted Allreduce *In Proceedings of the International Conference for High Performance Computing, Networking, Storage and Analysis (SC'23), presented in Denver, CO, USA, Association for Computing Machinery, ISBN: 979-8-400701-09-2, Nov. 2023 (acceptance rate 23.9%, 90/376)* , ***SC23 Best student paper, SC23 Reproducibility Advancement Award***

SC'23 Maciej Besta, Paweł Renc, Robert Gerstenberger, Paolo Sylos Labini, Alexandros Ziogas, Tiancheng Chen, Lukas Gianinazzi, Florian Scheidl, Kalman Szenes, Armon Carigiet, Patrick Iff, Grzegorz Kwasniewski, Raghavendra Kanakagiri, Chio Ge, Sammy Jaeger, Jarosław Wąs, Flavio Vella, Torsten Hoefler: High-Performance and Programmable Attentional Graph Neural Networks with Global Tensor Formulations *In Proceedings of the International Conference for High Performance Computing, Networking, Storage and Analysis (SC'23), presented in Denver, CO, USA, Association for Computing Machinery, ISBN: 979-8-400701-09-2, Nov. 2023 (acceptance rate 23.9%, 90/376)*

SC'23 Maciej Besta, Robert Gerstenberger, Marc Fischer, Michał Podstawski, Nils Blach, Berke Egeli, Georgy Mitenkov, Wojciech Chlapek, Marek Michalewicz, Hubert Niewiadomski, Jürgen Müller, Torsten Hoefler: The Graph Database Interface: Scaling Online Transactional and Analytical Graph Workloads to Hundreds of Thousands of Cores *In Proceedings of the International Conference for High Performance Computing, Networking, Storage and Analysis (SC'23), presented in Denver, CO, USA, Association for Computing Machinery, ISBN: 979-8-400701-09-2, Nov. 2023 (acceptance rate 23.9%, 90/376)* , ***Best Paper Finalist***

SC'23 Philipp Schaad, Timo Schneider, Tal Ben-Nun, Alexandros Nikolaos Ziogas, Alexandru Calotoiu, Torsten Hoefler: FuzzyFlow: Leveraging Dataflow To Find and Squash Program Optimization Bugs *In Proceedings of the International Conference for High Performance Computing, Networking, Storage and Analysis (SC'23), Association for Computing Machinery, ISBN: 979-8-400701-09-2, Nov. 2023 (acceptance rate 23.9%, 90/376)*

DAC'23 Patrick Iff, Maciej Besta, Matheus Cavalcante, Tim Fischer, Luca Benini, Torsten Hoefler: HexaMesh: Scaling to Hundreds of Chiplets with an Optimized Chiplet Arrangement *In Proceedings of the 60th Annual Design Automation Conference, Jul. 2023*

ATC'23 Andrei Ivanov, Benjamin Rothenberger, Arnaud Dethise, Marco Canini, Torsten Hoefler, Adrian Perrig: SAGE: Software-based Attestation for GPU Execution *In 2023 USENIX Annual Technical Conference (USENIX ATC 23), pages 485–499, USENIX Association, ISBN: 978-1-939133-35-9, Jul. 2023*

DAC'23 Patrick Iff, Maciej Besta, Matheus Cavalcante, Tim Fischer, Luca Benini, Torsten Hoefler: Sparse Hamming Graph: A Customizable Network-on-Chip Topology *In Proceedings of the 60th Annual Design Automation Conference, Jul. 2023*

ICS'23 Marcin Copik, Roman Böhringer, Alexandru Calotoiu, Torsten Hoefler: FMI: Fast and Cheap Message Passing for Serverless Functions *Jun. 2023*

HPDC'23 Tiziano De Matteis, Lukas Gianinazzi, Johannes de Fine Licht, Torsten Hoefler: Streaming Task Graph Scheduling for Dataflow Architectures *Jun. 2023*

CIAC'23 Tal Ben-Nun, Lukas Gianinazzi, Torsten Hoefler, Yishai Oltchik: Maximum Flows in Parametric Graph Templates *In Algorithms and Complexity - 13th International Conference, Jun. 2023*

ICS'23 Lukas Truemper, Tal Ben-Nun, Philipp Schaad, Alexandru Calotoiu, Torsten Hoefler: Performance Embeddings: A Similarity-Based Transfer Tuning Approach to Performance Optimization *Jun. 2023*

ICLR'23 Langwen Huang, Torsten Hoefler: Compressing multidimensional weather and climate data into neural networks *In The Eleventh International Conference on Learning Representations, May 2023,* ***Notable Top 5% (Spotlight)***

ICLR'23 Elias Frantar, Saleh Ashkboos, Torsten Hoefler, Dan Alistarh: GPTQ: Accurate Post-Training Quantization for Generative Pre-trained Transformers *In The Eleventh International Conference on Learning Representations, May 2023*

CGO'23 Tal Ben-Nun, Berke Ates, Alexandru Calotoiu, Torsten Hoefler: Bridging Control-Centric and Data-Centric Optimization *In 2023 IEEE/ACM International Symposium on Code Generation and Optimization (CGO), pages 173-185, Feb. 2023*

NeurIPS'22 Nikoli Dryden, Torsten Hoefler: Spatial Mixture-of-Experts *In Advances in Neural Information Processing Systems 35, presented in New Orleans, Louisiana, Dec. 2022*

SIGMETRICS Daniele De Sensi, Tiziano De Matteis, Konstantin Taranov, Salvatore Di Girolamo, Tobias Rahn, Torsten Hoefler: Noise in the Clouds: Influence of Network Performance Variability on Application Scalability *Proc. ACM Meas. Anal. Comput. Syst.. Vol 6, Nr. 3, presented in New York, NY, USA, Association for Computing Machinery, Dec. 2022*

NeurIPS'22 Saleh Ashkboos, Langwen Huang, Nikoli Dryden, Tal Ben-Nun, Peter Dueben, Lukas Gianinazzi, Luca Kummer, Torsten Hoefler: ENS-10: A Dataset For Post-Processing Ensemble Weather Forecasts *In Proceedings of the Neural Information Processing Systems Track on Datasets and Benchmarks, presented in New Orleans, Louisiana, Dec. 2022*

SC'22 Alexandros Nikolaos Ziogas, Grzegorz Kwasniewski, Tal Ben-Nun, Timo Schneider, Torsten Hoefler: Deinsum: Practically I/O Optimal Multilinear Algebra *In Proceedings of the International Conference for High Performance Computing, Networking, Storage and Analysis (SC'22), Nov. 2022*

SC'22 Tal Ben-Nun, Linus Groner, Florian Deconinck, Tobias Wicky, Eddie Davis, Johann Dahm, Oliver Elbert, Rhea George, Jeremy McGibbon, Lukas Trümper, Elynn Wu, Oliver Fuhrer, Thomas Schulthess, Torsten Hoefler: Productive Performance Engineering for Weather and Climate Modeling with Python *In Proceedings of the International Conference for High Performance Computing, Networking, Storage and Analysis (SC'22), Nov. 2022*

SC'22 Salvatore Di Girolamo, Daniele De Sensi, Konstantin Taranov, Milos Malesevic, Maciej Besta, Timo Schneider, Severin Kistler, Torsten Hoefler: Building Blocks for Network-Accelerated Distributed File Systems *In Proceedings of the International Conference for High Performance Computing, Networking, Storage and Analysis (SC'22), Nov. 2022,* ***Best Paper Finalist***

CCS'22 Konstantin Taranov, Benjamin Rothenberger, Daniele De Sensi, Adrian Perrig, Torsten Hoefler: NeVerMore: Exploiting RDMA Mistakes in NVMe-oF Storage Applications *In Proceedings of the 2022 ACM SIGSAC Conference on Computer and Communications Security (CCS '22), Nov. 2022,* ***Best Paper Honorable Mention***

SC'22 Philipp Schaad, Tal Ben-Nun, Torsten Hoefler: Boosting Performance Optimization with Interactive Data Movement Visualization *In Proceedings of the International Conference for High Performance Computing, Networking, Storage and Analysis (SC'22), ISBN: 9784665454445, Nov. 2022*

SC'22 Shigang Li, Kazuki Osawa, Torsten Hoefler: Efficient Quantized Sparse Matrix Operations on Tensor Cores *Nov. 2022,* ***Best Paper Finalist***

SC'22 Maciej Besta, Cesare Miglioli, Paolo Sylos Labini, Jakub Tětek, Patrick Iff, Raghavendra Kanakagiri, Saleh Ashkboos, Kacper Janda, Michal Podstawski, Grzegorz Kwasniewski, Niels Gleinig, Flavio Vella, Onur Mutlu, Torsten Hoefler: ProbGraph: High-Performance and High-Accuracy Graph Mining with Probabilistic Set Representations *In Proceedings of the International Conference for High Performance Computing, Networking, Storage and Analysis (SC'22), Nov. 2022,* ***SC22 Best Paper (1/82)***

SC'22 Kartik Lakhotia, Maciej Besta, Laura Monroe, Kelly Isham, Patrick Iff, Torsten Hoefler, Fabrizio Petrini: PolarFly: A Cost-Effective and Flexible Low-Diameter Topology *In Proceedings of the International Conference for High Performance Computing, Networking, Storage and Analysis (SC'22), Nov. 2022*

SC'22 Torsten Hoefler, Tommaso Bonato, Daniele De Sensi, Salvatore Di Girolamo, Shigang Li, Marco Heddes, Jon Belk, Deepak Goel, Miguel Castro, Steve Scott: HammingMesh: A Network Topology for Large-Scale Deep Learning *In Proceedings of the International Conference for High Performance Computing, Networking, Storage and Analysis (SC'22), Nov. 2022,* ***SC22 Reproducibility Advancement Award***

ICCAD'22 Carl-Johannes Johnsen, Tiziano De Matteis, Tal Ben-Nun, Johannes de Fine Licht, Torsten Hoefler: Temporal Vectorization: A Compiler Approach to Automatic Multi-Pumping *In 2022 IEEE/ACM International Conference On Computer Aided Design (ICCAD), Oct. 2022*

LOG'22 Maciej Besta, Patrick Iff, Florian Scheidl, Kazuki Osawa, Nikoli Dryden, Michal Podstawski, Tiancheng Chen, Torsten Hoefler: Neural Graph Databases *In Proceedings of the Learning on Graphs Conference (LOG'22), Sep. 2022*

KDD'22 Maciej Besta, Raphael Grob, Cesare Miglioli, Nicola Bernold, Grzegorz Kwasniewski, Gabriel Gjini, Raghavendra Kanakagiri, Saleh Ashkboos, Lukas Gianinazzi, Nikoli Dryden, Torsten Hoefler: Motif Prediction with Graph Neural Networks *In Proceedings of the 28th SIGKDD Conference on Knowledge Discovery and Data Mining (KDD'22), Aug. 2022*

ICS'22 Oliver Rausch, Tal Ben-Nun, Nikoli Dryden, Andrei Ivanov, Shigang Li, Torsten Hoefler: A Data-Centric Optimization Framework for Machine Learning *In Proceedings of the 2022 International Conference on Supercomputing (ICS'22), Jul. 2022*

ICS'22 Alexandru Calotoiu, Tal Ben-Nun, Grzegorz Kwasniewski, Johannes de Fine Licht, Timo Schneider, Philipp Schaad, Torsten Hoefler: Lifting C Semantics for Dataflow Optimization *In Proceedings of the 2022 International Conference on Supercomputing (ICS'22), Jul. 2022*

ICS'22 Larissa Schmid, Marcin Copik, Alexandru Calotoiu, Dominik Werle, Andreas Reiter, Michael Selzer, Anne Koziolek, Torsten Hoefler: Performance-Detective: Automatic Deduction of Cheap and Accurate Performance Models *In Proceedings of the 2022 International Conference on Supercomputing (ICS'22), Jul. 2022*

SIGMOD'22 Konstantin Taranov, Steve Byan, Virendra Marathe, Torsten Hoefler: KafkaDirect: Zero-copy Data Access for Apache Kafka over RDMA Networks *In Proceedings of the 2022 ACM SIGMOD International Conference on Management of Data, Jun. 2022*

IPDPS'22 András Strausz, Flavio Vella, Salvatore Di Girolamo, Maciej Besta, Torsten Hoefler: Asynchronous Distributed-Memory Triangle Counting and LCC with RMA Caching *In Proceedings of the 36th IEEE Interational Parallel and Distributed Processing Symposium, Jun. 2022*

ICST'22 Andrei Lascu and Alastair F. Donaldson and Tobias Grosser and Torsten Hoefler: Metamorphic Fuzzing of C++ Libraries *In IEEE International Conference on Software Testing, Verification and Validation, Jun. 2022*

IPDPS'22 Niels Gleinig, Maciej Besta, Torsten Hoefler: I/O-Optimal Cache-Oblivious Sparse Matrix-Sparse Matrix Multiplication *In Proceedings of the 36th IEEE International Parallel and Distributed Processing Symposium, Jun. 2022*

FCCM'22 Johannes de Fine Licht, Christopher A. Pattison, Alexandros Nikolaos Ziogas, David Simmons-Duffin, Torsten Hoefler: Fast Arbitrary Precision Floating Point on FPGA *In Proceedings of the 30th IEEE International Symposium on Field-Programmable Custom Computing Machines (FCCM'22), May 2022*

PPoPP'22 Shigang Li, Torsten Hoefler: Near-Optimal Sparse Allreduce for Distributed Deep Learning *In Proceedings of the 27th ACM SIGPLAN Symposium on Principles and Practice of Parallel Programming, Apr. 2022*

ICLR'22 Bryan A. Plummer, Nikoli Dryden, Julius Frost, Torsten Hoefler, Kate Saenko: Neural Parameter Allocation Search *In Tenth International Conference on Learning Representations, Apr. 2022*

DATE'22 Andrea Cossettini, Konstantin Taranov, Christian Vogt, Michele Magno, Torsten Hoefler, Luca Benini: A RDMA Interface for Ultra-Fast Ultrasound Data-Streaming over an Optical Link *In Proceedings of Design, Automation, and Test in Europe (DATE), 2022*

DAC'21 Niels Gleinig, Torsten Hoefler: An Efficient Algorithm for Sparse Quantum State Preparation *In Proceedings of the 58th Annual Design Automation Conference, presented in San Francisco, CA, USA, ACM, Dec. 2021 (acceptance rate 23%)*

Middleware'21 Marcin Copik, Grzegorz Kwasniewski, Maciej Besta, Michal Podstawski, Torsten Hoefler: SeBS: A Serverless Benchmark Suite for Function-as-a-Service Computing *In Proceedings of the 22nd International Middleware Conference, presented in Québec city, Canada, ACM, ISBN: 9781450385343, Dec. 2021*

SC21 Thomas Häner, Damian S. Steiger, Torsten Hoefler, Matthias Troyer: Distributed Quantum Computing with QMPI *In Proceedings of the International Conference for High Performance Computing, Networking, Storage and Analysis (SC21), Nov. 2021 (acceptance rate 25.9%, 98/379)*

SC21 Daniele De Sensi, Salvatore Di Girolamo, Saleh Ashkboos, Shigang Li, Torsten Hoefler: Flare: Flexible In-Network Allreduce *In Proceedings of the International Conference for High Performance Computing, Networking, Storage and Analysis (SC21), presented in St. Louis, Missouri, ACM, Nov. 2021 (acceptance rate 25.9%, 98/379)*

SC21 Nikoli Dryden, Roman Böhringer, Tal Ben-Nun, Torsten Hoefler: Clairvoyant Prefetching for Distributed Machine Learning I/O *In Proceedings of the International Conference for High Performance Computing, Networking, Storage and Analysis (SC21), presented in St. Louis, Missouri, ACM, Nov. 2021 (acceptance rate 25.9%, 98/379)*

SC21 Grzegorz Kwasniewski, Marko Kabić, Tal Ben-Nun, Alexandros Nikolaos Ziogas, Jens Eirik Saethre, André Gaillard, Timo Schneider, Maciej Besta, Anton Kozhevnikov, Joost VandeVondele, Torsten Hoefler: On the Parallel I/O Optimality of Linear Algebra Kernels: Near-Optimal Matrix Factorizations *In Proceedings of the International Conference for High Performance Computing, Networking, Storage and Analysis (SC21), Nov. 2021 (acceptance rate 25.9%, 98/379)*

SC21 Shigang Li, Torsten Hoefler: Chimera: Efficiently Training Large-Scale Neural Networks with Bidirectional Pipelines *In Proceedings of the International Conference for High Performance Computing, Networking, Storage and Analysis (SC21), presented in St. Louis, Missouri, ACM, Nov. 2021 (acceptance rate 25.9%, 98/379),* ***Best Paper Finalist***

SC21 Alexandros Nikolaos Ziogas, Timo Schneider, Tal Ben-Nun, Alexandru Calotoiu, Tiziano De Matteis, Johannes de Fine Licht, Luca Lavarini, Torsten Hoefler: Productivity, Portability, Performance: Data-Centric Python *In Proceedings of the International Conference for High Performance Computing, Networking, Storage and Analysis (SC21), Nov. 2021 (acceptance rate 25.9%, 98/379)*

OOPSLA'21 Arjun Pitchanathan, Christian Ulmann, Michel Weber, Torsten Hoefler, Tobias Grosser: FPL: fast Presburger arithmetic through transprecision *OOPSLA '21: Proceedings of the ACM international conference on Object oriented programming systems languages and applications. ACM, Nov. 2021,* ***OOPSLA distinguished paper award (6/71)***

MICRO'21 Maciej Besta, Raghavendra Kanakagiri, Grzegorz Kwasniewski, Rachata Ausavarungnirun, Jakub Beránek, Konstantinos Kanellopoulos, Kacper Janda, Zur Vonarburg-Shmaria, Lukas Gianinazzi, Ioana Stefan, Juan Gómez Luna, Marcin Copik, Lukas Kapp-Schwoerer, Salvatore Di Girolamo, Nils Blach, Marek Konieczny, Onur Mutlu, Torsten Hoefler: SISA: Set-Centric Instruction Set Architecture for Graph Mining on Processing-in-Memory Systems *In Proceedings of the 54th IEEE/ACM International Symposium on Microarchitecture (MICRO), Oct. 2021*

JMLR Torsten Hoefler, Dan Alistarh, Tan Ben-Nun, Nikoli Dryden, Alexandra Peste: Sparsity in Deep Learning: Pruning and growth for efficient inference and training in neural networks *Journal of Machine Learning Research. Vol 22, Nr. 241, pages 1-124, Sep. 2021*

VLDB'21 Maciej Besta, Zur Vonarburg-Shmaria, Yannick Schaffner, Leonardo Schwarz, Grzegorz Kwasniewski, Lukas Gianinazzi, Jakub Beranek, Kacper Janda, Tobias Holenstein, Sebastian Leisinger, Peter Tatkowski, Esref Ozdemir, Adrian Balla, Marcin Copik, Philipp Lindenberger, Pavel Kalvoda, Marek Konieczny, Onur Mutlu, Torsten Hoefler: GraphMineSuite: Enabling High-Performance and Programmable Graph Mining Algorithms with Set Algebra *In Proceedings of the 47th International Conference on Very Large Data Bases (VLDB'21), Aug. 2021*

ICML'21 Chris Cummins, Zacharias V. Fisches, Tal Ben-Nun, Torsten Hoefler, Michael O'Boyle, Hugh Leather: ProGraML: A Graph-based Program Representation for Data Flow Analysis and Compiler Optimizations *In Thirty-eighth International Conference on Machine Learning, presented in Virtual, PMLR, Jul. 2021 (acceptance rate 21%)*

USENIX ATC'21 Maksym Planeta, Jan Bierbaum, Leo Sahaya Daphne Antony, Torsten Hoefler, Hermann Härtig: MigrOS: Transparent Live-Migration Support for Containerised RDMA Applications *In Proceedings of the 2021 USENIX Annual Technical Conference, USENIX, Jul. 2021 (acceptance rate 18.8%, 64/341)*

USENIX ATC'21 Konstantin Taranov, Rodrigo Bruno, Gustavo Alonso, Torsten Hoefler: Naos: Serialization-free RDMA networking in Java *In Proceedings of the 2021 USENIX Annual Technical Conference, USENIX, Jul. 2021 (acceptance rate 18.8%, 64/341)*

SPAA'21 Grzegorz Kwasniewski, Tal Ben-Nun, Lukas Gianinazzi, Alexandru Calotoiu, Timo Schneider, Alexandros Nikolaos Ziogas, Maciej Besta, Torsten Hoefler: Pebbles, Graphs, and a Pinch of Combinatorics: Towards Tight I/O Lower Bounds for Statically Analyzable Programs *In Proceedings of the 33nd ACM Symposium on Parallelism in Algorithms and Architectures (SPAA'21), Jul. 2021 (acceptance rate 14.9%)*

SPAA'21 Lukas Gianinazzi, Maciej Besta, Yannick Schaffner, Torsten Hoefler: Parallel Algorithms for Finding Large Cliques in Sparse Graphs *In Proceedings of the 33rd ACM Symposium on Parallelism in Algorithms and Architectures (SPAA'21), ACM, Jul. 2021*

ISCA'21 Salvatore Di Girolamo, Andreas Kurth, Alexandru Calotoiu, Thomas Benz, Timo Schneider, Jakub Beránek, Luca Benini, Torsten Hoefler: A RISC-V in-network accelerator for flexible high-performance low-power packet processing *In Proceedings of the 48th Annual International Symposium on Computer Architecture (ISCA'21), Jun. 2021*

ICS'21 Alexandros Nikolaos Ziogas, Tal Ben-Nun, Timo Schneider, Torsten Hoefler: NPBench: A Benchmarking Suite for High-Performance NumPy *In Proceedings of the 2021 International Conference on Supercomputing (ICS'21), Jun. 2021*

SIGMOD'21 Konstantin Taranov, Salvatore Di Girolamo, Torsten Hoefler: CoRM: Compactable Remote Memory over RDMA *In Proceedings of the 2021 ACM SIGMOD International Conference on Management of Data, Jun. 2021*

IPDPS'21 Marcus Ritter, Alexander Geiss, Johannes Wehrstein, Alexandru Calotoiu, Thorsten Reimann, Torsten Hoefler, Felix Wolf: Noise-Resilient Empirical Performance Modeling with Deep Neural Networks *In IPDPS '21: Proceedings of the 35th IEEE Interational Parallel and Distributed Processing Symposium, May 2021*

MLSys'21 Andrei Ivanov, Nikoli Dryden, Tal Ben-Nun, Shigang Li, Torsten Hoefler: Data Movement Is All You Need: A Case Study on Optimizing Transformers *In Proceedings of Machine Learning and Systems 3 (MLSys 2021), Apr. 2021 (acceptance rate: 23.5% (52/221)),* ***Outstanding Paper Award (5/52)***

PPoPP'21 Marcin Copik, Alexandru Calotoiu, Tobias Grosser, Nicolas Wicki, Felix Wolf, Torsten Hoefler: Extracting Clean Performance Models from Tainted Programs *In PPoPP '21: Proceedings of the 26th ACM SIGPLAN Symposium on Principles and Practice of Parallel Programming, Feb. 2021 (acceptance rate: 21% (31/150))*

TPDS Maciej Besta and Jens Domke and Marcel Schneider and Marek Konieczny and Salvatore Di Girolamo and Timo Schneider and Ankit Singla and Torsten Hoefler: High-Performance Routing with Multipathing and Path Diversity in Ethernet and HPC Networks *In IEEE Transactions of Parallel and Distributed Systems, 2021*

IEEE TPDS Shigang Li, Tal Ben-Nun, Giorgi Nadiradze, Salvatore Di Girolamo, Nikoli Dryden, Dan Alistarh, Torsten Hoefler: Breaking (Global) Barriers in Parallel Stochastic Optimization with Wait-Avoiding Group Averaging *IEEE Transactions on Parallel and Distributed Systems (TPDS). Vol 32, Nr. 7, pages 1725-1739, IEEE, 2021*

USENIX Security'21 Benjamin Rothenberger, Konstantin Taranov, Adrian Perrig, Torsten Hoefler: ReDMArk: Bypassing RDMA Security Mechanisms *In Proceedings of the 2021 USENIX Security Symposium, USENIX, 2021*

CGO'21 Johannes de Fine Licht, Andreas Kuster, Tiziano De Matteis, Tal Ben-Nun, Dominic Hofer, Torsten Hoefler: StencilFlow: Mapping Large Stencil Programs to Distributed Spatial Computing Systems *In Proceedings of the 19th ACM/IEEE International Symposium on Code Generation and Optimization (CGO'21), 2021*

IEEE TPDS Johannes de Fine Licht, Maciej Besta, Simon Meierhans, Torsten Hoefler: Transformations of High-Level Synthesis Codes for High-Performance Computing *IEEE Transactions on Parallel and Distributed Systems (TPDS). 2021*

TACO21 Tobias Gysi, Christoph Müller, Oleksandr Zinenko, Stephan Herhut, Eddie Davis, Tobias Wicky, Oliver Fuhrer, Torsten Hoefler, Tobias Grosser: Domain-Specific Multi-Level IR Rewriting for GPU: The Open Earth Compiler for GPU-Accelerated Climate Simulation *ACM Trans. Archit. Code Optim.. Vol 18, Nr. 4, Association for Computing Machinery, ISSN: 1544-3566, 2021*

DATE Paul Scheffler, Florian Zaruba, Fabian Schuiki, Torsten Hoefler, Luca Benini: Indirection Stream Semantic Register Architecture for Efficient Sparse-Dense Linear Algebra *In Proceedings of Design, Automation, and Test in Europe (DATE), 2021*

SC20 Yuyang Jin, Haojie Wang, Teng Yu, Xiongchao Tang, Torsten Hoefler, Xu Liu, Jidong Zhai: SCALANA: Automating Scaling Loss Detection with Graph Analysis *In Proceedings of the International Conference for High Performance Computing, Networking, Storage and Analysis (SC20), Nov. 2020 (acceptance rate 25.1% (95/378))*

SC20 Daniele De Sensi and Salvatore Di Girolamo and Kim H. McMahon and Duncan Roweth and Torsten Hoefler: An In-Depth Analysis of the Slingshot Interconnect *In Proceedings of the International Conference for High Performance Computing, Networking, Storage and Analysis (SC20), Nov. 2020 (acceptance rate: 25.1% (95/378))*

IEEE TCAD Asif Ali Khan, Hauke Mewes, Tobias Grosser, Torsten Hoefler, Jeronimo Castrillon: Polyhedral Compilation for Racetrack Memories *IEEE Transactions on Computer-Aided Design of Integrated Circuits and Systems. Vol 39, Nr. 11, IEEE, Nov. 2020*

OOPSLA'20 Tobias Grosser, Theodoros Theodoridis, Maxmilian Falkenstein, Arjun Pitchanathan, Michael Kruse, Manuel Rigger, Zhendong Su, Torsten Hoefler: Fast Linear Programming through Transprecision Computing on Small and Sparse Data *OOPSLA'20: Proceedings of the ACM international conference on Object oriented programming systems languages and applications. ACM, Nov. 2020*

OOPSLA'20 Thomas Häner, Matthias Troyer, Torsten Hoefler: Assertion-based optimization of quantum programs *OOPSLA '20: Proceedings of the ACM international conference on Object oriented programming systems languages and applications. ACM, Nov. 2020*

SC20 Maciej Besta and Armon Carigiet and Kacper Janda and Zur Vonarburg-Shmaria and Lukas Gianinazzi and Torsten Hoefler: High-Performance Parallel Graph Coloring with Strong Guarantees on Work, Depth, and Quality *In Proceedings of the International Conference for High Performance Computing, Networking, Storage and Analysis (SC20), Nov. 2020 (acceptance rate: 25.1% (95/378))*

SC20 Maciej Besta and Marcel Schneider and Marek Konieczny and Karolina Cynk and Erik Henriksson and Salvatore Di Girolamo and Ankit Singla and Torsten Hoefler: FatPaths: Routing in Supercomputers and Data Centers when Shortest Paths Fall Short *In Proceedings of the International Conference for High Performance Computing, Networking, Storage and Analysis (SC20), Nov. 2020 (acceptance rate: 25.1% (95/378))*

SC20 Tiziano De Matteis and Johannes de Fine Licht and Torsten Hoefler: FBLAS: Streaming Linear Algebra on FPGA *In Proceedings of the International Conference for High Performance Computing, Networking, Storage and Analysis (SC20), Nov. 2020 (acceptance rate: 25.1% (95/378))*

VLDB'20 Claude Barthels, Ingo Müller, Konstantin Taranov, Torsten Hoefler, Gustavo Alonso: Strong consistency is not hard to get: TwoPhase Locking and TwoPhase Commit on Thousands of Cores *In Proceedings of the VLDB Endowment, Vol. 12, No. 13, VLDB Endowment, Sep. 2020*

USENIX ATC'20 Konstantin Taranov, Benjamin Rothenberger, Adrian Perrig, Torsten Hoefler: sRDMA – Efficient NIC-based Authentication and Encryption *In Proceedings of the 2020 USENIX Annual Technical Conference, USENIX, Jul. 2020, (acceptance rate 18.6%, 65/348)*

SPAA'20 Lukas Gianinazzi, Torsten Hoefler: Parallel Planar Subgraph Isomorphism and Vertex Connectivity *In Proceedings of the 32nd ACM Symposium on Parallelism in Algorithms and Architectures (SPAA'20), ACM, Jul. 2020*

DAC'20 Andreas Kurth, Samuel Riedel, Florian Zaruba, Torsten Hoefler, Luca Benini: ATUNs: Modular and Scalable Support for Atomic Operations in a Shared Memory Multiprocessor *In Proceedings of the 57th Annual Design Automation Conference, ACM, Jun. 2020,* ***Best Paper Finalist (6/228)***

CVPR'20 Elad Hoffer, Tal Ben-Nun, Itay Hubara, Niv Giladi, Torsten Hoefler, Daniel Soudry: Increasing batch size through instance repetition improves generalization *In The IEEE Conference on Computer Vision and Pattern Recognition (CVPR), Jun. 2020*

IPDPS'20 Marcus Ritter, Alexandru Calotoiu, Thorsten Reimann, Torsten Hoefler, Felix Wolf: Performance Modeling at a Discount *presented in New Orleans, LA, USA, IEEE, May 2020, Accepted at the 34th IEEE International Parallel and Distributed Processing Symposium (IPDPS'20)*

IPDPS'20 Maciej Besta, Raghavendra Kanakagiri, Harun Mustafa, Mikhail Karasikov, Gunnar Rätsch, Torsten Hoefler, Edgar Solomonik: Communication-Efficient Jaccard Similarity for High-Performance Distributed Genome Comparisons *May 2020, In Proceedings of the 34th IEEE International Parallel and Distributed Processing Symposium*

FPGA'20 Johannes de Fine Licht, Grzegorz Kwasniewski, Torsten Hoefler: Flexible Communication Avoiding Matrix Multiplication on FPGA with High-Level Synthesis *Feb. 2020, In Proceedings of the 28th ACM/SIGDA International Symposium on Field-Programmable Gate Arrays*

PPoPP'20 Shigang Li, Tal Ben-Nun, Salvatore Di Girolamo, Dan Alistarh, Torsten Hoefler: Taming Unbalanced Training Workloads in Deep Learning with Partial Collective Operations *In Proceedings of the 25th Symposium on Principles and Practice of Parallel Programming (PPoPP'20), Feb. 2020, (acceptance rate: 23.1% (28/121))*

SC19 Cedric Renggli, Dan Alistarh, Mehdi Aghagolzadeh, Torsten Hoefler: SparCML: High-Performance Sparse Communication for Machine Learning *In Proceedings of the International Conference for High Performance Computing, Networking, Storage and Analysis (SC19), presented in Denver, CO, USA, ACM, Nov. 2019 (acceptance rate: 22.7% (78/344))*

SC19 Tiziano De Matteis, Johannes de Fine Licht, Jakub Beránek, Torsten Hoefler: Streaming Message Interface: High-Performance DistributedMemory Programming on Reconfigurable Hardware *In Proceedings of the International Conference for High Performance Computing, Networking, Storage and Analysis (SC19), presented in Denver, CO, USA, ACM, Nov. 2019 (acceptance rate: 22.7% (78/344))*

SC19 Alexandros Nikolaos Ziogas, Tal Ben-Nun, Guillermo Indalecio Fernández, Timo Schneider, Mathieu Luisier, Torsten Hoefler: Optimizing the Data Movement in Quantum Transport Simulations via Data-Centric Parallel Programming *In Proceedings of the International Conference for High Performance Computing, Networking, Storage and Analysis (SC19), presented in Denver, CO, USA, ACM, Nov. 2019 (acceptance rate: 22.7% (78/344))*

SC19 Alexandros Nikolaos Ziogas, Tal Ben-Nun, Guillermo Indalecio Fernández, Timo Schneider, Mathieu Luisier, Torsten Hoefler: A Data-Centric Approach to Extreme-Scale Ab initio Dissipative Quantum Transport Simulations *In Proceedings of the International Conference for High Performance Computing, Networking, Storage and Analysis (SC19), presented in Denver, CO, USA, ACM, Nov. 2019,* ***Gordon Bell Prize Winner***

SC19 Salvatore Di Girolamo, Konstantin Taranov, Andreas Kurth, Michael Schaffner, Timo Schneider, Jakub Beranek, Maciej Besta, Luca Benini, Duncan Roweth, Torsten Hoefler: Network-Accelerated Non-Contiguous Memory Transfers *In Proceedings of the International Conference for High Performance Computing, Networking, Storage and Analysis (SC19), presented in Denver, CO, USA, ACM, Nov. 2019 (acceptance rate: 22.7% (78/344))*

SC19 Daniele De Sensi, Salvatore Di Girolamo, Torsten Hoefler: Mitigating Network Noise on Dragonfly Networks through Application-Aware Routing *In Proceedings of the International Conference for High Performance Computing, Networking, Storage and Analysis (SC19), presented in Denver, CO, USA, ACM, Nov. 2019 (acceptance rate: 22.7% (78/344))*

SC19 Tal Ben-Nun, Johannes de Fine Licht, Alexandros Nikolaos Ziogas, Timo Schneider, Torsten Hoefler: Stateful Dataflow Multigraphs: A Data-Centric Model for Performance Portability on Heterogeneous Architectures *In Proceedings of the International Conference for High Performance Computing, Networking, Storage and Analysis (SC19), presented in Denver, CO, USA, ACM, Nov. 2019 (acceptance rate: 22.7% (78/344))*

SC19 Maciej Besta, Simon Weber, Lukas Gianinazzi, Robert Gerstenberger, Andrey Ivanov, Yishai Oltchik, Torsten Hoefler: Slim Graph: Practical Lossy Graph Compression for Approximate Graph Processing, Storage, and Analytics *In Proceedings of the International Conference for High Performance Computing, Networking, Storage and Analysis (SC19), presented in Denver, CO, USA, ACM, Nov. 2019 (acceptance rate: 22.7% (78/344))*

SC19 Grzegorz Kwasniewski and Marko Kabić and Maciej Besta and Joost VandeVondele and Raffaele Solcà and Torsten Hoefler: Red-Blue Pebbling Revisited: Near Optimal Parallel Matrix-Matrix Multiplication *In Proceedings of the International Conference for High Performance Computing, Networking, Storage and Analysis (SC19), presented in Denver, CO, USA, ACM, Nov. 2019 (acceptance rate: 22.7% (78/344)),* ***SC19 Best Student Paper***

PASC'19 Felix Thaler, Stefan Moosbrugger, Carlos Osuna, Mauro Bianco, Hannes Vogt, Anton Afanasyev, Lukas Mosimann, Oliver Fuhrer, Thomas Schulthess, Torsten Hoefler: Porting the COSMO Weather Model to Intel KNL *presented in Zurich, Switzerland, ACM, Jun. 2019, Accepted at the ACM Platform for Advanced Scientific Computing Conference (PASC19)*

DAC'19 Niels Gleinig and Frances Ann Hubis and Torsten Hoefler: Embedding Functions Into Reversible Circuits: A Probabilistic Approach to the Number of Lines *Proceedings of the 56th Annual Design Automation Conference, presented in Las Vegas, NV, USA, ACM, ISBN: 978-1-4503-6725-7/19/06, Jun. 2019*

PLDI'19 T. Gysi, T. Grosser, L. Brandner, T. Hoefler: A Fast Analytical Model of Fully Associative Caches *Proceedings of the 40th ACM SIGPLAN Conference on Programming Language Design and Implementation, presented in Phoenix, AZ, USA, pages 816–829, ACM, ISBN: 978-1-4503-6712-7, Jun. 2019*

ICS'19 Paul R. Eller, Torsten Hoefler, William Gropp: Using Performance Models to Understand Scalable Krylov Solver Performance at Scale for Structured Grid Problems *Proceedings of the 2019 ACM International Conference on Supercomputing (ICS'19), presented in Phoenix, AZ, ACM, Jun. 2019*

IPDPS'19 S. Di Girolamo, P. Schmid, T. Schulthess, T. Hoefler: SimFS: A Simulation Data Virtualizing File System Interface *IEEE, May 2019, Accepted at the 33rd IEEE International Parallel & Distributed Processing Symposium (IPDPS'19)*

IPDPS'19 T. Ben-Nun, M. Besta, S. Huber, A. N. Ziogas, D. Peter, T. Hoefler: A Modular Benchmarking Infrastructure for High-Performance and Reproducible Deep Learning *IEEE, May 2019, Accepted at the 33rd IEEE International Parallel & Distributed Processing Symposium (IPDPS'19)*

PPoPP'19 Martin Kuettler, Maksym Planeta, Jan Bierbaum, Carsten Weinhold, Hermann Haertig, Amnon Barak, Torsten Hoefler: Corrected Trees for Reliable Group Communication *Feb. 2019, Accepted at The ACM Conference Principles and Practice of Parallel Programming 2019 (PPoPP'19) (acceptance rate: 19% (29/152))*

FPGA'19 Maciej Besta, Marc Fischer, Tal Ben-Nun, Johannes De Fine Licht, Torsten Hoefler: Substream-Centric Maximum Matchings on FPGA *Feb. 2019, In Proceedings of the 27th ACM/SIGDA International Symposium on Field-Programmable Gate Arrays (acceptance rate: 23%),* ***Best Paper Finalist (4/30)***

NIPS'18 Tal Ben-Nun, Alice Shoshana Jakobovits, Torsten Hoefler: Neural Code Comprehension: A Learnable Representation of Code Semantics *In Advances in Neural Information Processing Systems 31, presented in Montreal, Canada, Curran Associates, Inc., Dec. 2018*

NIPS'18 Dan Alistarh, Torsten Hoefler, Mikael Johansson, Sarit Khirirat, Nikola Konstantinov, Cedric Renggli: The Convergence of Sparsified Gradient Methods *In Advances in Neural Information Processing Systems 31, presented in Montreal, Canada, Curran Associates, Inc., Dec. 2018*

PACT'18 M. Besta, D. Stanojevic, T. Zivic, J. Singh, M. Hoerold, T. Hoefler: Log(Graph): A Near-Optimal High-Performance Graph Representation *Limassol, Cyprus, ACM, Nov. 2018, Accepted at the 27th International Conference on Parallel Architectures and Compilation (PACT'18)*

SC18 Heng Lin, Xiaowei Zhu, Bowen Yu, Xiongchao Tang, Wei Xue, Wenguang Chen, Lufei Zhang, Torsten Hoefler, Xiaosong Ma, Xin Liu, Weimin Zheng, Jingfang Xu: ShenTu: Processing Multi-Trillion Edge Graphs on Millions of Cores in Seconds *In Proceedings of the International Conference for High Performance Computing, Networking, Storage and Analysis (SC18), presented in Denver, CO, USA, ACM, Nov. 2018,* ***Gordon Bell Award Finalist***

Cluster'18 Y. Oyama, T. Ben-Nun, T. Hoefler, S. Matsuoka: Accelerating Deep Learning Frameworks with Micro-batches *In IEEE International Conference on Cluster Computing, CLUSTER 2018, Belfast, UK, September 10-13, 2018, presented in Belfast, UK, IEEE, ISBN: 978-1-5386-8319-4, Sep. 2018, (28% (44/154))*

Cluster'18 Alexandru Calotoiu, Alexander Graf, Torsten Hoefler, Daniel Lorenz, Sebastian Rinke, Felix Wolf: Lightweight Requirements Engineering for Exascale Co-design *In IEEE International Conference on Cluster Computing, CLUSTER 2018, Belfast, UK, September 10-13, 2018, presented in Belfast, UK, IEEE, ISBN: 978-1-5386-8319-4, Sep. 2018, (28% (44/154))*

EuroSys'18 K. Taranov, G. Alonso, T. Hoefler: Fast and strongly-consistent per-item resilience in key-value stores *Apr. 2018, EuroSys '18: Thirteenth EuroSys Conference 2018, April 23–26, 2018, Porto, Portugal (acceptance rate: 16% (43/262))*

ASPLOS'18 M. Besta, S. M. Hassan, S. Yalamanchili, R. Ausavarungnirun, O. Mutlu, T. Hoefler: Slim NoC: A Low-Diameter On-Chip Network Topology for High Energy Efficiency and Scalability *Mar. 2018, Accepted at the 23rd ACM International Conference on Architectural Support for Programming Languages and Operating Systems (ASPLOS'18)*

PPoPP'18 Lukas Gianinazzi, Pavel Kalvoda, Alessandro De Palma, Maciej Besta, Torsten Hoefler: Communication-Avoiding Parallel Minimum Cuts and Connected Components *In Proceedings of the 23rd ACM SIGPLAN Symposium on Principles and Practice of Parallel Programming, presented in Vienna, Austria, pages 403–404, ACM, ISBN: 978-1-4503-4982-6, Feb. 2018*

PPoPP'18 J. de Fine Licht, M. Blott, T. Hoefler: Designing scalable FPGA architectures using high-level synthesis *In Proceedings of the 23rd ACM SIGPLAN Symposium on Principles and Practice of Parallel Programming, presented in Vienna, Austria, pages 403–404, ACM, ISBN: 978-1-4503-4982-6, Feb. 2018*

ICDE'18 Ingo Mueller, Andrea Arteaga, Torsten Hoefler, Gustavo Alonso: Reproducible Floating-Point Aggregation in RDBMSs *Feb. 2018, In Proceedings of the 2018 IEEE 34th International Conference on Data Enineering*

SC17 E. Solomonik, M. Besta, F. Vella, T. Hoefler: Scaling Betweenness Centrality using Communication-Efficient Sparse Matrix Multiplication *In Proceedings of the International Conference for High Performance Computing, Networking, Storage and Analysis (SC17), Nov. 2017, (acceptance rate: 18% (61/327))*

SC17 T. Hoefler, S. Di Girolamo, K. Taranov, R. E. Grant, R. Brightwell: sPIN: High-performance streaming Processing in the Network *In Proceedings of the International Conference for High Performance Computing, Networking, Storage and Analysis (SC17), Nov. 2017, (acceptance rate: 18% (61/327))* ***Best Paper Finalist (5/61)***

VLDB'17 C. Barthels, T. Schneider, I. Mueller, G. Alonso, T. Hoefler: Distributed Join Algorithms on Thousands of Cores *Vol 10, Nr. 5, In Proc. VLDB Endow., presented in Munich, Germany, pages 517–528, VLDB Endowment, ISSN: 2150-8097, Aug. 2017*

HOTI'17 P. Yebenes, J. Escudero-Sahuquillo, P. J. Garcia, F. J. Quiles, T. Hoefler: Improving Non-Minimal and Adaptive Routing Algorithms in Slim Fly Networks *In Proceedings of the 25th Annual Symposium on High-Performance Interconnects (HOTI'17), Aug. 2017,* ***Best Student Paper***

HOTI'17 T. Schneider, J. Dinan, M. Flajslik, K. D. Underwood, and T. Hoefler: Fast Networks and Slow Memories: A Mechanism for Mitigating Bandwidth Mismatches *In Proceedings of the 25th Annual Symposium on High-Performance Interconnects (HOTI'17), Aug. 2017*

HPDC'17 M. Poke, T. Hoefler, C. W. Glass: AllConcur: Leaderless Concurrent Atomic Broadcast *In Proceedings of the 26th International Symposium on High-Performance Parallel and Distributed Computing (HPDC'17), presented in Washington, DC, USA, ACM, Jun. 2017, (acceptance rate: 19%)*

HPDC'17 M. Besta, M. Podstawski, L. Groner, E. Solomonik, T. Hoefler: To Push or To Pull: On Reducing Communication and Synchronization in Graph Computations *In Proceedings of the 26th International Symposium on High-Performance Parallel and Distributed Computing (HPDC'17), presented in Washington, DC, USA, ACM, Jun. 2017, (acceptance rate: 19%)*

ICCS'17 A. Arteaga, O. Fuhrer, T. Hoefler, T. Schulthess: Model-Driven Choice of Numerical Methods for the Solution of the Linear Advection Equation *In Proceedings of the International Conference on Computational Science (ICCS'17), presented in Zurich, Switzerland, Elsevier, Jun. 2017*

SPAA'17 E. Solomonik, G. Ballard, J. Demmel, T. Hoefler: A Communication-Avoiding Parallel Algorithm for the Symmetric Eigenvalue Problem *Nr. 11, In Proceedings of the 29th ACM Symposium on Parallelism in Algorithms and Architectures (SPAA'17), presented in Washington, DC, USA, pages 111–121, ACM, ISBN: 978-1-4503-4593-4, Jun. 2017*

IPDPS'17 M. Besta, F. Marending, E. Solomonik, T. Hoefler: SlimSell: A Vectorized Graph Representation for Breadth-First Search *In Proceedings of the 31st IEEE International Parallel & Distributed Processing Symposium (IPDPS'17), presented in Orlando, FL, USA, IEEE, May 2017, (acceptance rate: 22%, 116/516)*

IPDPS'17 S. Di Girolamo, F. Vella and T. Hoefler: Transparent Caching for RMA Systems *In Proceedings of the 31st IEEE International Parallel & Distributed Processing Symposium (IPDPS'17), presented in Orlando, FL, USA, IEEE, May 2017, (acceptance rate: 22%, 116/516)*

IPDPS'17 T. Hoefler, A. Barak, A. Shiloh and Z. Drezner: Corrected Gossip Algorithms for Fast Reliable Broadcast on Unreliable Systems *In Proceedings of the 31st IEEE International Parallel & Distributed Processing Symposium (IPDPS'17), presented in Orlando, FL, USA, IEEE, May 2017, (acceptance rate: 22%, 116/516)*

IPDPS'17 T. Wicky, E. Solomonik and T. Hoefler: Communication-Avoiding Parallel Algorithms for Solving Triangular Systems of Linear Equations *In Proceedings of the 31st IEEE International Parallel & Distributed Processing Symposium (IPDPS'17), presented in Orlando, FL, USA, IEEE, May 2017, (acceptance rate: 22%, 116/516)*

IPDPS'17 S. Ramos and T. Hoefler: Capability Models for Manycore Memory Systems: A Case-Study with Xeon Phi KNL *Proceedings of the 31st IEEE International Parallel & Distributed Processing Symposium (IPDPS'17), presented in Orlando, FL, USA, IEEE, May 2017, (acceptance rate: 22%, 116/516)*

PPoPP'17 S. Shudler, A. Calotoiu, T. Hoefler, F. Wolf: Isoefficiency in Practice: Configuring and Understanding the Performance of Task-based Applications *In Proceedings of the 22nd ACM SIGPLAN symposium on Principles and practice of parallel programming, presented in College Station, TX, ACM, Feb. 2017 (acceptance rate: 21%, 29/139)*

OOPSLA'16 Andrei Marian Dan, Patrick Lam, T. Hoefler, and Martin Vechev: Modeling and Analysis of Remote Memory Access Programming *ACM Symposium on Object-oriented Programming, Systems, Languages, and Applications OOPSLA'16 (acceptance rate: 25%, 52/203),* ***Outstanding Paper Award (4/52)***

SC16 T. Gysi, J. Baer, and T. Hoefler: dCUDA: Hardware Supported Overlap of Computation and Communication *In Proceedings of the IEEE/ACM International Conference on High Performance Computing, Networking, Storage and Analysis (SC16) (acceptance rate: 18%, 82/446)*

SC16 J. Domke and T. Hoefler: Scheduling-Aware Routing for Supercomputers *In Proceedings of the IEEE/ACM International Conference on High Performance Computing, Networking, Storage and Analysis (SC16) (acceptance rate: 18%, 82/446)*

SC16 W. Tang, B. Wang, S. Ethier, G. Kwasniewski, T. Hoefler, K. Ibrahim, K. Madduri, S. Williams, L. Oliker, C. Rosales-Fernandez, and T. Williams: Extreme Scale Plasma Turbulence Simulations on Top Supercomputers Worldwide *In Proceedings of the IEEE/ACM International Conference on High Performance Computing, Networking, Storage and Analysis (SC16) (acceptance rate: 18%, 82/446)*

SC16 M. Martinasso, G. Kwasniewski, S. Alam, T. Schulthess, and T. Hoefler: A PCIe Congestion-Aware Performance Model for Densely Populated Accelerator Servers *In Proceedings of the IEEE/ACM International Conference on High Performance Computing, Networking, Storage and Analysis (SC16) (acceptance rate: 18%, 82/446)*

HOTI'16 T. Schneider, O. Bibartiu and T. Hoefler: Ensuring Deadlock-Freedom in Low-Diameter InfiniBand Networks *In Proceedings of the 24th IEEE Symposium on High-Performance Interconnects, HOTI'16,* ***Best Student Paper***

HPDC'16 J. Domke, T. Hoefler, and S. Matsuoka: Routing on the Dependency Graph: A New Approach to Deadlock-Free High-Performance Routing *In Proceedings of the 25th Symposium on High-Performance Parallel and Distributed Computing (HPDC'16) (acceptance rate: 16%, 20/129)*

HPDC'16 P. Schmid, M. Besta, and T. Hoefler: High-Performance Distributed RMA Locks *In Proceedings of the 25th Symposium on High-Performance Parallel and Distributed Computing (HPDC'16) (acceptance rate: 16%, 20/129),* ***received Karsten Schwan Best Paper Award (1/20)***

ICS'16 T. Grosser and T. Hoefler: Polly-ACC: Transparent compilation to heterogeneous hardware *In Proceedings of the the 30th International Conference on Supercomputing (ICS'16) (acceptance rate: 24%, 43/178)*

PACT'15 H. Schweizer, M. Besta, and T. Hoefler: Evaluating the Cost of Atomic Operations on Modern Architectures *In Proceedings of the 24th International Conference on Parallel Architectures and Compilation (PACT'15) (acceptance rate: 21%, 38/179)*

PACT'15 A. Bhattacharyya and T. Hoefler: Using Compiler Techniques to Improve Automatic Performance Modeling *In Proceedings of the 24th International Conference on Parallel Architectures and Compilation (PACT'15) (acceptance rate: 21%, 38/179)*

SC15 T. Hoefler and R. Belli: Scientific Benchmarking of Parallel Computing Systems *In Proceedings of the IEEE/ACM International Conference on High Performance Computing, Networking, Storage and Analysis (SC15) (acceptance rate: 22%, 79/358)*

SC15 G. Kathareios, C. Minkenberg, B. Prisacari, G. Rodriguez, and T. Hoefler: Cost-Effective Diameter-Two Topologies: Analysis and Evaluation *In Proceedings of the IEEE/ACM International Conference on High Performance Computing, Networking, Storage and Analysis (SC15) (acceptance rate: 22%, 79/358)*

HOTI'15 S. Di Girolamo, P. Jolivet, K. D. Underwood and T. Hoefler: Exploiting Offload Enabled Network Interfaces *In Proceedings of the 23rd IEEE Symposium on High-Performance Interconnects, HOTI'15,* ***Best Student Paper***

HPDC'15 M. Besta and T. Hoefler: Accelerating Irregular Computations with Hardware Transactional Memory and Active Messages *In Proceedings of ACM Symposium on High-Performance Parallel and Distributed Computing, HPDC'15 (acceptance rate: 16% (19/116)),* ***HPDC'15 Best Paper (1/19)***

ICS'15 S. Shudler, A. Calotoiu, T. Hoefler, and F. Wolf: Exascaling Your Library: Will Your Implementation Meet Your Expectations? *In Proceedings of the ACM Conference on Supercomputing, ICS'15 (acceptance rate: 25% (40/160))*

HPDC'15 M. Poke and T. Hoefler: DARE: High-Performance State Machine Replication on RDMA Networks *Accepted at ACM HPDC'15 (acceptance rate: 16% (19/116))*

ICS'15 M. Besta and T. Hoefler: Active Access: A Mechanism for High-Performance Distributed Data-Centric Computations *In Proceedings of the ACM Conference on Supercomputing, ICS'15 (acceptance rate: 25% (40/160))*

ICS'15 T. Gysi, T. Grosser, and T. Hoefler: MODESTO: Data-centric Analytic Optimization of Complex Stencil Programs on Heterogeneous Architectures *In Proceedings of the ACM Conference on Supercomputing, ICS'15 (acceptance rate: 25% (40/160))*

HPDC'15 S. Ramos and T. Hoefler: Cache Line Aware Optimizations for ccNUMA Systems *In Proceedings of ACM Symposium on High-Performance Parallel and Distributed Computing, HPDC'15 (short paper)*

IPDPS'15 R. Belli and T. Hoefler: Notified Access: Extending Remote Memory Access Programming Models for Producer-Consumer Synchronization *In Proceedings of the IEEE International Parallel and Distributed Processing Symposium (IPDPS), (acceptance rate: 21.8% (108/496)),* ***IPDPS'15 Best Paper (4/108)***

SC14 M. Besta and T. Hoefler: Slim Fly: A Cost Effective Low-Diameter Network Topology *In Proceedings of IEEE/ACM International Conference on High Performance Computing, Networking, Storage and Analysis (SC14), (acceptance rate: 21%, 82/394),* ***SC14 Best Student Paper (1/82)***

SC14 J. Domke, T. Hoefler, and S. Matsuoka: Fail-in-Place Network Design: Interaction between Topology, Routing Algorithm and Failures *In Proceedings of IEEE/ACM International Conference on High Performance Computing, Networking, Storage and Analysis (SC14), (acceptance rate: 21%, 82/394)*

SC14 K. B. Ferreira, P. Widener, S. Levy, D. Arnold, and T. Hoefler: Understanding the Effects of Communication and Coordination on Checkpointing at Scale *In Proceedings of IEEE/ACM International Conference on High Performance Computing, Networking, Storage and Analysis (SC14), (acceptance rate: 21%, 82/394)*

PACT'14 A. Bhattacharyya and T. Hoefler: PEMOGEN: Automatic Adaptive Performance Modeling during Program Runtime *In Proceedings of 23rd Intl. Conference on Parallel Architectures and Compilation Techniques (PACT'14)*

HPDC'14 B. Prisacari, G. Rodriguez, P. Heidelberger, D. Chen, C. Minkenberg and T. Hoefler: Efficient Task Placement and Routing in Dragonfly Networks *In Proceedings of the 23rd ACM International Symposium on High-Performance Parallel and Distributed Computing (HPDC'14), (acceptance rate: 16%, 21/130)*

HPDC'14 M. Besta and T. Hoefler: Fault Tolerance for Remote Memory Access Programming Models *In Proceedings of the 23rd ACM International Symposium on High-Performance Parallel and Distributed Computing (HPDC'14), (acceptance rate: 16%, 21/130),* ***Best Paper Nominee (3/21)***

SPAA'14 T. Hoefler and G. Kwasniewski: Automatic Complexity Analysis of Explicitly Parallel Programs *In Proceedings of the 26th ACM Symposium on Parallelism in Algorithms and Architectures (SPAA'14), (acceptance rate: 25%, 30/122)*

IPDPS'14 A. Arteaga, T. Hoefler and O. Fuhrer: Designing Bit-Reproducible Portable High-Performance Applications *In Proceedings of IEEE International Parallel & Distributed Processing Symposium (IPDPS), (acceptance rate: 21.1%, 114/541)*

SC13 A. Calotoiu, T. Hoefler, M. Poke, and F. Wolf: Using Automated Performance Modeling to Find Scalability Bugs in Complex Codes *In Proceedings of the IEEE/ACM International Conference on High Performance Computing, Networking, Storage and Analysis (SC13), (acceptance rate: 20%, 92/457)*

SC13 R. Gerstenberger, M. Besta, and T. Hoefler: Enabling Highly-Scalable Remote Memory Access Programming with MPI-3 One Sided *In Proceedings of the IEEE/ACM International Conference on High Performance Computing, Networking, Storage and Analysis (SC13), (acceptance rate: 20%, 92/457),* ***SC13 Best Paper Award (1/92) and Best Student Paper Finalist (8/92)***

SC13 A. Friedley, G. Bronevetsky, A. Lumsdaine, and T. Hoefler: Hybrid MPI: Efficient Message Passing for Multi-core Systems *In Proceedings of the IEEE/ACM International Conference on High Performance Computing, Networking, Storage and Analysis (SC13), (acceptance rate: 20%, 92/457)*

ICPP'13 T. Schneider, R. Grant, B. Barrett, R. Brightwell, and T. Hoefler: Protocols for Fully Offloaded Collective Operations on Accelerated Network Adapters *In Proceedings of the Intl. Conference on Parallel Processing, ICPP'13*

EuroMPI'13 T. Schneider, F. Kjolstad, and T. Hoefler: MPI Datatype Processing using Runtime Compilation *In Processdings of ACM/SIGHPC Recent Advances in Message Passing Interface, EuroMPI'13,* ***Best Paper Award (1/25)***

ICS'13 B. Prisacari, G. Rodriguez, C. Minkenberg, and T. Hoefler: Bandwidth-optimal Alltoall Exchanges in Fat Tree Networks *In Proceedings of the 27th ACM International Conference on Supercomputing, ICS'13 (acceptance rate: 21%, 41/198)*

HPDC'13 S. Ramos Garea and T. Hoefler: Modeling Communication in Cache-Coherent SMP Systems - A Case-Study with Xeon Phi *In Proceedings of the 22nd ACM Symposium on High-Performance Parallel and Distributed Computing, HPDC'13 (acceptance rate: 15%, 20/131)*

HPDC'13 S. Li, T. Hoefler, and M. Snir: NUMA-Aware Shared Memory Collective Communication for MPI *In Proceedings of the 22nd ACM Symposium on High-Performance Parallel and Distributed Computing, HPDC'13 (acceptance rate: 15%, 20/131),* ***Best Paper Nominee (3/20)***

PPoPP'13 A. Friedley, T. Hoefler, G. Bronevetsky, and A. Lumsdaine: Ownership Passing: Efficient Distributed Memory Programming on Multi-core Systems *In Proceedings of the 18th ACM SIGPLAN symposium on Principles and Practice of Parallel Programming, PPoPP'13, pages 177–186. ACM, Feb. 2013 (acceptance rate: 21%, 100/472)*

SC12 T. Hoefler and T. Schneider: Optimization Principles for Collective Neighborhood Communications *In Proceedings of the International Conference on High Performance Computing, Networking, Storage and Analysis, SC'12, pages 98:1–98:10. IEEE Computer Society Press, Nov. 2012, (acceptance rate: 21%, 100/472)*

EuroMPI'12 T. Schneider, R. Gerstenberger, and T. Hoefler: Micro-Applications for Communication Data Access Patterns and MPI Datatypes *In Recent Advances in the Message Passing Interface - 19th European MPI Users' Group Meeting, EuroMPI 2012, volume 7490, pages 121-131. Springer, Sept. 2012*

EuroMPI'12 S. Pellegrini, T. Hoefler, and T. Fahringer: Exact Dependence Analysis for Increased Communication Overlap *In Recent Advances in the Message Passing Interface - 19th European MPI Users' Group Meeting, EuroMPI 2012, volume 7490, pages 89–99. Springer, Sept. 2012*

EuroMPI'12 T. Hoefler J. Dinan, D. Buntinas, P. Balaji, B. Barrett, R. Brightwell, W. Gropp, V. Kale, and R. Thakur: Leveraging MPI's One-Sided Communication Interface for Shared-Memory Programming *In Recent Advances in the Message Passing Interface - 19th European MPI Users' Group Meeting, EuroMPI 2012, volume 7490, pages 132–141. Springer, Sept. 2012*

PACT'12 T. Hoefler and T. Schneider: Runtime Detection and Optimization of Collective Communication Patterns *In Proceedings of the 21st international conference on Parallel Architectures and Compilation Techniques, PACT'12, pages 263–272. ACM, Sept. 2012, (acceptance rate: 19%, 39/207)*

SC11 T. Hoefler, W. Gropp, M. Snir, and W. Kramer: Performance Modeling for Systematic Performance Tuning *In State of the Practice Reports, SC'11, pages 6:1–6:12. ACM, Nov. 2011*

EuroMPI'11 W. Gropp, T. Hoefler, R. Thakur, and J. L. Traeff: Performance Expectations and Guidelines for MPI Derived Datatypes *In Recent Advances in the Message Passing Interface, EuroMPI'11, volume 6960, pages 150–159. Springer, Sept. 2011*

EuroMPI'11 V. Venkatesan, M. Chaarawi, E. Gabriel, and T. Hoefler.: Design and Evaluation of Nonblocking Collective I/O Operations *In Recent Advances in the Message Passing Interface, EuroMPI'11, volume 6960, pages 90–98. Springer, Sept. 2011*

EuroMPI'11 T. Hoefler, and M. Snir.: Writing Parallel Libraries with MPI - Common Practice, Issues, and Extensions *In Recent Advances in the Message Passing Interface, EuroMPI'11, volume 6960, pages 345–355. Springer, Sept. 2011, Keynote Paper at the IMUDI session at EuroMPI 2011 Conference*

ICS'11 T. Hoefler and M. Snir.: Generic Topology Mapping Strategies for Large-scale Parallel Architectures. *In Proceedings of the 2011 ACM International Conference on Supercomputing, ICS'11, pages 75–85. ACM, Jun. 2011 (acceptance rate 21.7%, 35/161)*

ICS'11 J. Willcock, T. Hoefler, N. Edmonds, and A. Lumsdaine.: Active Pebbles: Parallel Programming for Data-Driven Applications. *In Proceedings of the 2011 ACM International Conference on Supercomputing, ICS'11, pages 235–245. ACM, Jun. 2011 (acceptance rate 21.7%, 35/161)*

IPDPS'11 J. Domke, T. Hoefler, and W. Nagel.: Deadlock-Free Oblivious Routing for Arbitrary Topologies. *In Proceedings of the 25th IEEE International Parallel & Distributed Processing Symposium, IPDPS'11, pages 613–624. IEEE Computer Society, May 2011 (acceptance rate: 19.6%, 112/571)*

PPoPP'11 J. Willcock, T. Hoefler, N. Edmonds, and A. Lumsdaine.: Active Pebbles: A Programming Model For Highly Parallel Fine-Grained Data-Driven Computations. *In Proceedings of the 16th ACM symposium on Principles and Practice of Parallel Programming, PPoPP'11, pages 305–306. ACM, Feb. 2011,* ***Best Poster at PPoPP'11*** *(acceptance rate: 25%, 26/165 papers + 16/165 poster).*

SC'10 T. Hoefler, T. Schneider, and A. Lumsdaine.: Characterizing the Influence of System Noise on Large-Scale Applications by Simulation. *In Proceedings of the 2010 ACM/IEEE International Conference for High Performance Computing, Networking, Storage and Analysis, SC'10, pages 1–11. IEEE Computer Society, Nov. 2010,* ***Best Paper at SC10****, (acceptance rate: 19.8%, 50/253)*

PACT'10 J. Willcock, T. Hoefler, N. Edmonds, and A. Lumsdaine.: AM++: A Generalized Active Message Framework. *In Proceedings of the 19th international conference on Parallel Architectures and Compilation Techniques, PACT'10, pages 401-410. ACM, Sept. 2010 (acceptance rate: 17%, 46/266)*

EuroMPI'10 T. Hoefler, G. Bronevetsky, B. Barrett, B. R. de Supinski, and A. Lumsdaine.: Efficient MPI Support for Advanced Hybrid Programming Models. *In Recent Advances in the Message Passing Interface, EuroMPI'10, pages 50–61, volume LNCS 6305. Springer, Sept. 2010*

EuroMPI'10 T. Hoefler, W. Gropp, R. Thakur, and J. L. Traeff.: Toward Performance Models of MPI Implementations for Understanding Application Scaling Issues. *In Recent Advances in the Message Passing Interface, EuroMPI'10, pages 21–30, volume LNCS 6305. Springer, Sept. 2010*

EuroMPI'10 T. Hoefler and S. Gottlieb.: Parallel Zero-Copy Algorithms for Fast Fourier Transform and Conjugate Gradient using MPI Datatypes. *In Recent Advances in the Message Passing Interface, EuroMPI'10, pages 132–141, volume LNCS 6305. Springer, Sept. 2010*

HotI'10 B. Arimilli, R. Arimilli, V. Chung, S. Clark, W. Denzel, B. Drerup, T. Hoefler, J. Joyner, J. Lewis, J. Li, N. Ni, and R. Rajamony.: The PERCS High-Performance Interconnect. *Proceedings of 18th Symposium on High-Performance Interconnects (Hot Interconnetcs 2010). IEEE, Aug. 2010. (invited paper)*

PPoPP'10 T. Hoefler, C. Siebert, and A. Lumsdaine.: Scalable Communication Protocols for Dynamic Sparse Data Exchange. *Proceedings of the 2010 ACM SIGPLAN Symposium on Principles and Practice of Parallel Programming, pages 159–168. ACM, Jan. 2010. (acceptance rate: 16.8%, 29/173)*

HotI'09 T. Hoefler, T. Schneider, and A. Lumsdaine.: Optimized Routing for Large-Scale InfiniBand Networks. *17th Annual IEEE Symposium on High Performance Interconnects, HOTI'09, IEEE Computer Society, Aug. 2009. (acceptance rate: 30%, 14/47)*

ICPP'09 T. Hoefler, C. Siebert, and A. Lumsdaine.: Group Operation Assembly Language - A Flexible Way to Express Collective Communication *ICPP-2009 - The 38th International Conference on Parallel Processing. IEEE, Sep. 2009. (acceptance rate: 32%, 71/220)*

EuroMPI'09 T. Hoefler, A. Lumsdaine, and J. Dongarra.: Towards Efficient MapReduce Using MPI. *Recent Advances in Parallel Virtual Machine and Message Passing Interface, 16th European PVM/MPI Users' Group Meeting, EuroPVM/MPI'09. Springer, Sep. 2009.*

LCI'09 J. Mueller, T. Schneider, J. Domke, R. Geyer, M. Haesing, T. Hoefler, S. Hoehlig, G. Juckeland A. Lumsdaine, M. Mueller, and W. Nagel.: Cluster Challenge 2008: Optimizing Cluster Configuration and Applications to Maximize Power Efficiency. *Proceedings of the 10th LCI International Conference on High-Performance Clustered Computing, LCI'09, Mar. 2009,* ***Best Student Paper at LCI'09***

Cluster'08 T. Hoefler, T. Schneider, and A. Lumsdaine.: Multistage Switches are not Crossbars: Effects of Static Routing in High-Performance Networks. *Proceedings of the 2008 IEEE International Conference on Cluster Computing, CLUSTER'08. IEEE Computer Society, Oct. 2008. (acceptance rate: 30%, 28/92)*

Cluster'08 T. Hoefler and A. Lumsdaine.: Message Progression in Parallel Computing - To Thread or not to Thread? *Proceedings of the 2008 IEEE International Conference on Cluster Computing, CLUSTER'08. IEEE Computer Society, Oct. 2008. (acceptance rate: 30%, 28/92)*

HotI'08 P. Geoffray and T. Hoefler.: Adaptive Routing Strategies for Modern High Performance Networks. *16th Annual IEEE Symposium on High Performance Interconnects, HOTI'08, pages 165–172. IEEE Computer Society, Aug. 2008. (acceptance rate: 30%, 14/47)*

SPAA'08 T. Hoefler, P. Gottschling, and A. Lumsdaine.: Leveraging Non-blocking Collective Communication in High-performance Applications. *Proceedings of the Twentieth Annual Symposium on Parallelism in Algorithms and Architectures, SPAA'08, pages 113–115. Association for Computing Machinery (ACM), Jun. 2008. (acceptance rate: 28%, 36/128)*

SC07 T. Hoefler, A. Lumsdaine, and W. Rehm.: Implementation and Performance Analysis of Non-Blocking Collective Operations for MPI. *In proceedings of the 2007 International Conference on High Performance Computing, Networking, Storage and Analysis, SC07. IEEE Computer Society/ACM, Nov. 2007. (acceptance rate: 20%, 54/268)*

EuroMPI'06 T. Hoefler, P. Gottschling, W. Rehm, and A. Lumsdaine.: Optimizing a Conjugate Gradient Solver with Non-Blocking Collective Operations. *Proceedings of Recent Advantages in Parallel Virtual Machine and Message Passing Interface, EuroPVM/MPI'06, pages 374–382. Springer, Sep. 2006.*

Edited Journals

IJHPCA'13 T. Hoefler and Kamil Iskra (Editors).: Operating systems and runtime environments on supercomputers *IJHPCA, May 2013 (vol 27 no. 2).*

IJHPCA'12 T. Hoefler and Kamil Iskra (Editors).: Issues in Large Scale Computing Environments: Heterogeneous Computing and Operating Systems *IJHPCA, May 2012 (vol 26 no. 2).*

IEEE Micro'12 T. Hoefler, P. Geoffray, F. Petrini, J. L. Traeff (Editors).: Top Picks from Hot Interconnects 2011: Petascale Network Architectures *IEEE Micro, Jan/Feb. 2012 (vol 32 no. 1).*

PARCO'12 T. Hoefler (Editor).: Extensions for Next-Generation Parallel Programming Models. *Elsevier Parallel Computing, Jan/Feb. 2012.*

Selected Journal Publications and Book Chapters

IEEE CiSE Torsten Hoefler, Marcin Copik, Pete Beckman, Andrew Jones, Ian Foster, Manish Parashar, Daniel Reed, Matthias Troyer, Thomas Schulthess, Dan Ernst, Jack Dongarra: XaaS: Acceleration as a Service to Enable Productive High-Performance Cloud Computing *USENIX: The Advanced Computing Systems Association, Dec. 2024*

TACO Andrea Lepori, Alexandru Calotoiu, Torsten Hoefler: Iterating Pointers: Enabling Static Analysis for Loop-based Pointers *ACM Transactions on Architecture and Code Optimization. Oct. 2024*

IEEE Computer Torsten Hoefler, Duncan Roweth, Keith Underwood, Bob Alverson, Mark Griswold, Vahid Tabatabaee, Mohan Kalkunte, Surendra Anubolu, Siyuan Shen, Abdul Kabbani, Moray McLaren, Steve Scott: Datacenter Ethernet and RDMA: Issues at Hyperscale *IEEE Computer. Vol 56, Nr. 7, pages 67-77, Jul. 2024,* ***Cover Feature Technology Predictions***

IEEE TPAMI Maciej Besta, Torsten Hoefler: Parallel and Distributed Graph Neural Networks: An In-Depth Concurrency Analysis *IEEE Transactions on Pattern Analysis and Machine Intelligence. Vol 46, Nr. 5, pages 2584-2606, IEEE Press, May 2024*

ESSD Bjorn Stevens et al.: Earth Virtualization Engines (EVE) *Earth System Science Data. Vol 16, Nr. 4, pages 2113-2122, Apr. 2024*

Nature CompSci Peter Bauer, Torsten Hoefler, Bjorn Stevens, Wilco Hazeleger: Digital twins of Earth and the computing challenge of human interaction *Nature Computational Science. Vol 4, Nr. 1, pages 154-157, Mar. 2024*

ACM CSUR Maciej Besta, Robert Gerstenberger, Emanuel Peter, Marc Fischer, Michał Podstawski, Claude Barthels, Gustavo Alonso, Torsten Hoefler: Demystifying Graph Databases: Analysis and Taxonomy of Data Organization, System Designs, and Graph Queries *ACM Comput. Surv.. Vol 56, Nr. 2, Association for Computing Machinery, ISSN: 0360-0300, Sep. 2023*

Nature Earth Peter Bauer, Peter D. Dueben, Matthew Chantry, Francisco Doblas-Reyes, Torsten Hoefler, Amy McGovern, Bjorn Stevens: Deep learning and a changing economy in weather and climate prediction *Nature Reviews Earth and Environment. Vol 4, Nr. 1, pages 507-509, Aug. 2023*

IEEE TPDS Maciej Besta, Marc Fischer, Vasiliki Kalavri, Michael Kapralov, Torsten Hoefler: Practice of Streaming Processing of Dynamic Graphs: Concepts, Models, and Systems *IEEE Transactions of Parallel and Distributed Systems. Vol 34, Nr. 6, pages 1860–1876, IEEE, Jun. 2023*

IEEE Computer Torsten Hoefler, Ariel Hendel, Duncan Roweth: The Convergence of Hyperscale Data Center and High-Performance Computing Networks *IEEE Computer. Vol 55, Nr. 7, pages 29-37, Jul. 2022,* ***Cover Feature Technology Predictions***

IEEE Computer Torsten Hoefler: Benchmarking data science: Twelve ways to lie with statistics and performance on parallel computers *IEEE Computer. Vol 55, pages 49-56, Aug. 2022,* ***Cover Feature Research Reproducibility***

IEEE TPDS Marcin Copik, Tobias Grosser, Torsten Hoefler, Paolo Bientinesi, Benjamin Berkels: Work-stealing prefix scan: Addressing load imbalance in large-scale image registration *IEEE Transactions on Parallel and Distributed Systems (TPDS). IEEE, Jul. 2021 to appear*

Nature CompSci Peter Bauer, Peter D. Dueben, Torsten Hoefler, Tiago Quintino, Thomas C. Schulthess, Nils P. Wedi: The digital revolution of Earth-system science *Nature Computational Science. Vol 1, Nr. 1, pages 104-113, Feb. 2021*

RSTA Peter Grönquist, Chengyuan Yao, Tal Ben-Nun, Nikoli Dryden, Peter Dueben, Shigang Li, Torsten Hoefler: Deep Learning for Post-Processing Ensemble Weather Forecasts *Philosophical Transactions of the Royal Society A. Vol 379, Nr. 2194, The Royal Society, Feb. 2021*

IEEE TOC Florian Zaruba, Fabian Schuiki, Torsten Hoefler, Luca Benini: Snitch: A tiny Pseudo Dual-Issue Processor for Area and Energy Efficient Execution of Floating-Point Intensive Workloads *IEEE Transactions on Computers (TOC). IEEE, Sep. 2020,* ***Featured Paper in November 2021 issue***

TQC'21 David Ittah, Thomas Häner, Vadym Kliuchnikov, Torsten Hoefler: QIRO: A Static Single Assignment-Based Quantum Program Representation for Optimization *In ACM Transactions on Quantum Computing, Association for Computing Machinery, ISSN: 2643-6809, Aug. 2021*

IEEE TOC Fabian Schuiki, Florian Zaruba, Torsten Hoefler, Luca Benini: Stream Semantic Registers: A Lightweight RISC-V ISA Extension Achieving Full Compute Utilization in Single-Issue Cores *IEEE Transactions on Computers (TOC). IEEE, Apr. 2020*

TRETS Maciej Besta, Marc Fischer, Tal Ben-Nun, Dimitri Stanojevic, Johannes de Fine Licht, Torsten Hoefler: Substream-Centric Maximum Matchings on FPGA *In Proceedings of the ACM Trans. Reconfig. Technol. Systems*

TPDS Sergei Shudler, Yannick Berens, Alexandru Calotoiu, Torsten Hoefler, Alexandre Strube, Felix Wolf: Engineering Algorithms for Scalability through Continuous Validation of Performance Expectations *IEEE Transactions on Parallel and Distributed Systems (TPDS). Vol 30, Nr. 8, IEEE, Jul. 2019*

CiSE T. Schulthess, P. Bauer, O. Fuhrer, T. Hoefler, C. Schaer, N. Wedi: Reflecting on the goal and baseline for exascale computing: a roadmap based on weather and climate simulations *Computing in Science and Engineering (CiSE). Vol 21, Nr. 1, IEEE Computer Society, ISSN: 1521-9615, Jan. 2019*

CACM R. Gerstenberger, M. Besta, T. Hoefler: Enabling Highly-Scalable Remote Memory Access Programming with MPI-3 One Sided *In Communications of the ACM, ACM, Oct. 2018,* ***Invited Article to Research Highlights***

GMD'18 O. Fuhrer, T. Chadha, T. Hoefler, G. Kwasniewski, X. Lapillonne, D. Leutwyler, D. Luethi, C. Osuna, C. Schaer, T. C. Schulthess, H. Vogt: Near-global climate simulation at 1 km resolution: establishing a performance baseline on 4888 GPUs with COSMO 5.0 *Geoscientific Model Development. Vol 11, Nr. 4, Copernicus Publications, May 2018*

IEEE TPDS'18 Shigang Li, Yunquan Zhang, Torsten Hoefler: Cache-Oblivious MPI All-to-All Communications Based on Morton Order *IEEE Transactions on Parallel and Distributed Systems (TPDS). Vol 29, Nr. 3, IEEE, Mar. 2018*

IEEE TPDS'17 Didem Unat, Anshu Dubey, Torsten Hoefler, John Shalf, Mark Abraham, Mauro Bianco, Bradford L. Chamberlain, Romain Cledat, H. Carter Edwards, Hal Finkel, Karl Fuerlinger, Frank Hannig, Emmanuel Jeannot, Amir Kamil, Jeff Keasler, Paul H J Kelly, Vitus Leung, Hatem Ltaief, Naoya Maruyama, Chris J. Newburn, and Miquel Pericas: Trends in Data Locality Abstractions for HPC Systems *IEEE Transactions on Parallel and Distributed Systems (TPDS). Vol 28, Nr. 10, IEEE, Oct. 2017*

IEEE TPDS'16 S. Ramos and T. Hoefler.: Cache Line Aware Algorithm Design for Cache-Coherent Architectures *IEEE Transactions on Parallel and Distributed Systems (TPDS). Vol PP, Nr. 99, IEEE, Jan. 2016*

IEEE MICRO'16 S. Di Girolamo, P. Jolivet, K. D. Underwood, and T. Hoefler.: Exploiting Offload Enabled Network Interfaces *IEEE MICRO. Vol 36, Nr. 4, IEEE, Jul. 2016*

ACM TOPC'15 T. Hoefler, J. Dinan, R. Thakur, B. Barrett, P. Balaji, W. Gropp, K. Underwood.: Remote Memory Access Programming in MPI-3 *ACM Transactions on Parallel Computing (TOPC). ACM, Jan. 2015*

JSFI'14 T. Hoefler and D. Moor.: Energy, Memory, and Runtime Tradeoffs for Implementing Collective Communication Operations *Journal of Supercomputing Frontiers and Innovations. Vol 1, Nr. 2, pages 58–75, Oct. 2014*

Computing'13 T. Schneider, R. Gerstenberger, T. Hoefler.: Application-oriented ping-pong benchmarking: how to assess the real communication overheads. *Journal of Computing. Springer, May. 2013.*

Computing'13 T. Hoefler, J. Dinan, D. Buntinas, P. Balaji, B. Barrett, R. Brightwell, W. Gropp, V. Kale and R. Thakur.: MPI + MPI: a new hybrid approach to parallel programming with MPI plus shared memory. *Journal of Computing. Springer, May. 2013.*

MPI-3.0 Standard The MPI Forum.: MPI: A Message-Passing Interface Standard, Version 2.2. *Technical report, MPI Forum, 2012. (Chapters 5 (Collective Operations), 7 (Process Topologies), and 11 (One Sided)).*

ACM TACO (HIPEAC) B. Prisacari, G. Rodriguez, C. Minkenberg, and T. Hoefler: Fast Pattern-Specific Routing for Fat Tree Networks *In ACM Transactions on Architecture and Code Optimization, and presented at the HIPEAC 2014 conference, (acceptance rate: 24%, 2011)*

PPL'11 P. Balaji, D. Buntinas, D. Goodell, W. Gropp, T. Hoefler, S. Kumar, E. Lusk, R. Thakur, and J. L. Traeff.: MPI on Millions of Cores. *Parallel Processing Letters (PPL), Mar. 2011.*

CiSE'10 T. Hoefler.: Software and Hardware Techniques for Power-Efficient HPC Networking. *Computing in Science and Engineering (CiSE), Dec. 2010.*

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CCPE'10 T. Hoefler, R. Rabenseifner, H. Ritzdorf, B. R. de Supinski, R. Thakur, , and J. L. Traeff.: The Scalable Process Topology Interface of MPI 2.2. *Concurrency and Computation: Practice and Experience, Dec. 2010.*

MPI-2.2 Standard The MPI Forum.: MPI: A Message-Passing Interface Standard, Version 2.2. *Technical report, MPI Forum, 2009. (Chapters 5 (Collective Operations) and 7 (Process Topologies)).*

PPL'09 T. Hoefler, T. Schneider, and A. Lumsdaine.: The Effect of Network Noise on Large-Scale Collective Communications. *Parallel Processing Letters (PPL), 19(4):573–593, Aug. 2009.*

PARCO'07 T. Hoefler, P. Gottschling, A. Lumsdaine, and W. Rehm.: Optimizing a Conjugate Gradient Solver with Non-Blocking Collective Operations. *Elsevier Journal of Parallel Computing (PARCO), 33(9):624–633, Sep. 2007.*

Patents

Summary: 14 patents

US11076210B1 T. Hoefler, M. Heddes, D. Goel, J. Belk: Distributed processing architecture *US CN WO*

US20220138524A1 M. Heddes, T. Hoefler, K. Colwell, A. Phanishayee: Training neural networks based on dual pipeline architectures *US WO EP*

US20220244911A1 M. Heddes, T. Hoefler: Digital circuitry for normalization functions *WO US TW JP KR CN*

US11886938B2 D. Goel, M. Heddes, T. Hoefler, X. Xu: Message communication between integrated computing devices *WO EP US CN KR TW*

US11720252B1 M. Heddes, A. More, N. Shah, T. Hoefler: Method and apparatus for compressing and decompressing sparse data sets *WO EP US CN TW*

US20240303117A1 F. Paravecino, M. Davies, A. Kulkarni, A. Raihan, A. More, A Ankit, T. Hoefler, D. Burger: Assigning workloads to physical resources in spatial architectures *WO US*

US20240314073A1 A. Kabbani, T. Hoefler: Adaptive packet routing *WO US*

US20250047613A1 A. Kabbani, T. Hoefler: Round-trip time and explicit congestion notification signals for bandwidth utilization *US*

WO2025034413A1 A. Kabbani, T. Hoefler: Recycled entropies packet spraying *WO*

WO2025034414A1 A. Kabbani, T. Hoefler: Fairness and congestion control convergence *WO*

WO2025034418A1 A. Kabbani, T. Hoefler: Scalable coordination of congestion control and adaptive load balancing *WO*

WO2025034417A1 T. Hoefler, A. Kabbani: Low overhead send/receive data delivery into user memory *WO*

WO2025034412A1 A. Kabbani, T. Hoefler: Weighted random early back-to-sender notification *WO*

WO2025034415A1 A. Kabbani, T. Hoefler: Coordinating congestion control and adaptive load balancing *WO*

Selected Invited Talks

Summary: 46 invited keynotes, more than 100 invited talks, not counting regular conference or workshop paper presentations

Keynote AI for Science at SC24	**AI for High-Performance Climate and Earth Virtualization Engines** Keynote at the 2024 Workshop on Artificial Intelligence and Machine Learning for Scientific Applications in conjunction with Supercomputing SC24	**Atlanta, GA, USA**
Keynote ACM MobiHoc'24	**Converged Cloud Networking in the Age of (AI) Computing** Keynote at the 25th International Symposium on Theory, Algorithmic Foundations, and Protocol Design for Mobile Networks and Mobile Computing	**Athens, Greece**
Keynote HPCAC'24	**Scalable and Efficient AI: Federated Supercomputers and Smartphones** Keynote at the HPC Advisory Council Conference 2024	**Locarno, Switzerland**
Keynote SCAsia'24	**High-performance Climate Simulations and AI** Keynote at Supercomputing Asia Conference 2024	**Sydney, Australia**
Keynote ADAC'24	**Scalable and Efficient AI: Federated Supercomputers and Smartphones** Keynote at 14th Accelerated Data Analytics and Computing Institute Symposium 2024	**Sydney, Australia**
Plenary Talk FCRC'23	**AI and HPC at a Crossroads** Keynote at ACM Federated Computing Research Conference (FCRC), 2023	**Orlando, FL, USA**
Keynote ACM REP'23	**Reproducing Performance - The Good, the Bad, and the Ugly** Opening keynote at 1st ACM Conference on Reproducibility and Replicability	**Santa Cruz, CA, USA**
Keynote ICPP'23	**Scalable and Efficient AI: From Supercomputers to Smartphones** Keynote talk at the 52nd International Conference on Parallel Processing	**Salt Lake City, UT, USA**
Keynote HPCAC'23	**Network support for High-Performance Deep Learning Systems** Keynote at the HPC Advisory Council Conference 2023	**Lugano, Switzerland**
Keynote CCWC'23	**Distributed AI Supercomputing: Large-Scale Transformers to Graph Neural Networks** Keynote at the IEEE 13th Annual Computing and Communication Workshop and Conference	**virtual**
Keynote HPC Asia'23	**Principles and Systems for AI Supercomputing** Keynote at the HPC Asia 2023 conference, Singapore	**Singapore**
Keynote Intel Fellows Forum	**Efficient AI: From Supercomputers to Smartphones** Keynote at the Intel Fellows Forum - Distributed Systems Summit, virtual	**virtual**
Korea AI Summit	**Efficient AI: From Supercomputers to Smartphones** Invited talk at the 2022 Korean AI summit in Seoul, Korea	**Seoul, Korea**
Keynote NTCI'22	**Efficient AI: From Supercomputers to Smartphones** Keynote at the 2022 International Symposium on New Trends in Computational Intelligence	**virtual**
Keynote IEMTRONICS'22	**Sparsity in Deep Learning** Keynote at the IOT, Electronics and Mechatronics Conference 2022, virtual	**virtual**
Keynote HPCAC'22	**New trends for sPIN-based in-network computing - from sparse reductions to RISC-V** Keynote as HPC Advisory Council Conference 2022, Lugano, Switzerland	**virtual**
Plenary HPCW'22	**The Three Pillars of Large-scale Deep Learning** Plenary talk at the Japanese NVIDIA HPC Weeks 2021	**virtual**
Keynote RSD'22	**Data-Centric Python - Productivity, portability and all with high performance!** Keynote at the Russian Supercomputing Days 2021	**virtual**
Keynote COLOC'21	**Data-Centric Python - Productivity, portability and all with high performance!** Keynote at the 5th workshop on data locality COLOC'21	**virtual**
Keynote SNN'21	**Sparsity in Deep Learning** Opening keynote and tutorial at the Sparsity in Neural Networks workshop (SNN'21)	**virtual**
Keynote DLonSC'21	**High-Performance Scalable Deep Learning** Keynote talk at the Deep Learning on Supercomputers Workshop in conjunction with ISC'21	**virtual**

Keynote HEART'21 — **Portable high-performance Python on CPUs, GPUs, and FPGAs** — **virtual**
Keynote talk at the International Symposium on Highly Efficient Accelerators and Reconfigurable Technologies (HEART 2021)

Keynote CIUK'20 — **A data-centric approach to performance portability** — **virtual**
Keynote at the 2020 HPC conference Computing Insight UK (CIUK'20)

Keynote Bench'20 — **Keynote & Award Lecture (BenchCouncil Rising Star Award): Scientific Benchmarking of Parallel Computing Systems** — **virtual**
2020 BenchCouncil International Symposium on Benchmarking, Measuring and Optimizing (Bench'20)

Keynote DISC'20 — **High-performance distributed memory systems from supercomputers to data centers** — **virtual**
34th International Symposium on Distributed Computing (DISC)

Keynote HPBD&IS'20 — **High-Performance Communication in Machine Learning** — **virtual**
Keynote talk at the (Virtual) International Conference no High-Performance Big Data and Intelligent Systems (HPBD&IS'20)

Keynote MLHPC'19 — **HPC for ML and ML for HPC - Scalability, Communication, and Programming** — **Denver, CO, USA**
Keynote talk at the International Machine Learning in High-Performance Computing (MLHPC'19 in conjunction with ACM/IEEE Supercomputing, SC19)

Keynote PPAM'19 — **High-Performance Communication in Machine Learning** — **Bialystok, Poland**
Keynote talk at the 13th International Conference on Parallel Processing and Applied Mathematics (PPAM'19)

Keynote ParCo'19 — **Data-Centric Parallel Programming** — **Prague, Czech Republic**
Keynote talk at the 18th International Parallel Computing conference (ParCo'19)

Keynote EMiT'19 — **High-Performance Communication for Machine Learning** — **Huddersfield, UK**
Keynote talk at the 5th Conference on Emerging Technologies – EMiT2019

Keynote AsHES — **Performance Portability with Data-Centric Parallel Programming** — **virtual**
Keynote talk at the 9th International Workshop on Accelerators and Hybrid Exascale Systems (AsHES)

Keynote AHPC'19 — **High-Performance Communication in Machine Learning** — **Grundlsee, Austria**
Keynote at the Austrian HPC meeting 2019

Keynote ExaMPI'18 — **RDMA, Scalable MPI-3 RMA, and Next-Generation Post-RDMA Interconnects** — **Dallas, TX, USA**
Keynote at ExaMPI 2018 Workshop (in conjunction with SC18)

Tsinghua University — **Performance Modeling for Future Computing Technologies** — **Beijing, China**
Invited talk at 60 years of CS @ Tsinghua celebration

Keynote HPCAC — **Demystifying Parallel and Distributed Deep Learning on Supercomputers: An In-Depth Concurrency Analysis** — **Lugano, Switzerland**
Keynote at Swiss HPC Advisory Council Conference 2018

Keynote Multicore @ Siemens — **Developing high-performance software, from modeling to programming** — **Nuremberg, Germany**
Invited opening presentation at the Multicore@Siemens conference

Keynote HiPINEB'18 — **The three L's in modern high-performance networking: low latency, low cost, low processing load** — **in conjunction with HPCA'17**
Keynote at the HiPINEB workshop at HPCA'18

Keynote EMBRACE'17 — **Scientific Benchmarking of Parallel Computing Systems** — **in conjunction with IPDPS'17**
Keynote talk at EMBRACE Workshop (IPDPS'17)

Keynote HPC China'16 — **Theory and Practice in HPC: Modeling, Programming, and Networking** — **Xi'an, China**
Keynote at the HPC China 2016 conference

Keynote Cluster'16 — **Theory and Practice in HPC: Modeling, Programming, and Networking** — **Taipei, Taiwan**
Opening Keynote at the IEEE Cluster 2016 conference

Keynote HIPS'15 — **How fast will your application go? Static and dynamic techniques for application performance modeling.** — **Hyderabad, India**
Keynote at the HIPS'15/LSPP'15 combined workshop in conjunction with IPDPS'15

Keynote LLVMHPC'14	**A case for runtime recompilation in HPC** Keynote at the LLVM Compiler Infrastructure in HPC workshop at SC14, Nov. 2014	**New Orleans, LA, USA**
Keynote ExaMPI'13	**MPI Beyond 3.0 and Towards Larger-Scale Computing** Keynote at the Workshop on Exascale MPI at SC13, Nov. 2013, ≈120 attendees	**Denver, CO, USA**
SC13	**The Second Green Graph500 List** Birds of a Feather, Nov. 2013	**Denver, CO, USA**
Dagstuhl	**Fault Tolerance for Remote Memory Access Programming Models** Invited to seminar "Resilience in Exascale Computing"	**Dagstuhl, Germany**
ISC'13	**The First Green Graph500 List** Birds of a Feather, Jun. 2013	**Leipzig, Germany**
EASC'13	**Application-Centric Benchmarking and Modeling for Co-Design** Exascale Applications and Software Conference	**Edinburgh, UK**
Keynote MCC'12	**MPI-3.0: A Response to New Challenges in Hardware and Software** Keynote talk at Multicore Challenge Conference 2012	**Stuttgart, Germany**
TiTech'12	**Optimized routing and process mapping for arbitrary network topologies** Invited talk at Tokio Institute of Technology	**Tokio, Japan**
Keynote EuroMPI'11	**Writing Parallel Libraries with MPI - The Good, the Bad, and the Ugly** Keynote talk at 18th European PVM/MPI User's Group Meeting	**Santorini, Greece**
Keynote EnA-HPC'11	**Energy-aware Software Development for Massive-Scale Systems** Keynote at the International Conference on Energy-Aware High Performance Computing	**Hamburg, Germany**
Jülich 2011	**Model-Driven HPC Software and System Design and Optimization** Jülich Supercomputing Center, Apr. 2011	**Jülich, Germany**
Keynote PROPER'10	**Analytical Performance Modeling and Simulation for Blue Waters** Keynote at the Workshop on Productivity and Performance in conjunction with EuroPar, Aug. 2010	**Ischia, Italy**
Argonne Natl. Laboratory	**Nonblocking and Sparse Collective Operations on Petascale Computers** Argonne National Laboratory, Jun. 2010	**Chicago, IL, USA**
SC'09 BoF	**Selected MPI-2.2 and MPI-3 Features** MPICH Birds of a Feather, Nov. 2009	**Portland, OR, USA**
Cisco Systems	**The Effects of Common Communication Patterns in Large-Scale Networks with Switch-Based Static Routing** Nerd Lunch at Cisco Systems, Aug. 2008	**San Jose, CA, USA**
Berkeley Natl. Laboratory	**Multistage Interconnection Networks are not Crossbars** Lawrence Berkeley National Laboratory, Aug. 2008	**Berkeley, CA, USA**
Livermore Natl. Laboratory	**Non-blocking Collective Operations for MPI** Lawrence Livermore National Laboratory, Aug. 2008	**Livermore, CA, USA**
HLRS	**Non-blocking Collectives for MPI-2** High Performance Computing Center Stuttgart (HLRS), Dec. 2007	**Stuttgart, Germany**
ABINIT Workshop	**Optimization of a parallel 3d-FFT with non-blocking Collective Operations** Invited to the 3rd International ABINIT Developer Workshop, Jan. 2007	**Liege, Belgium**
TU Munich	**Fast Barrier Synchronization for InfiniBand** Technical University of Munich, Sep. 2005	**Munich, Germany**

Impact

Microsoft Maia	**Network and Programming Model Architecture** Network and Programming model co-architect of a production-level AI Supercomputing System (Chip, Rack-Level, System-level co-design from ground up for AI workloads)

DFSSSP Routing **Deadlock-free Single Source Shortest Path routing**
The fastest routing algorithm for arbitrary topologies. Available in OpenSM (the InfiniBand subnet manager) and used at various sites. (with J. Domke)

Nonblocking Collectives **Nonblocking Collective Operations for MPI**
Proposed algorithms and reference implementation that are now used in virtually every MPI implementation. Drove the standardization in MPI-3.0.

Neighborhood Collectives **Neighborhood Collective Operations for MPI**
Proposed algorithms and reference implementation that are now used in virtually every MPI implementation. Drove the standardization in MPI-3.0.

RMA Programming **Remote Memory Access Programming**
Co-editor and driver of the MPI-3.0 One Sided chapter. This functionality is implemented in virtually all MPI libraries. (with W. Gropp and R. Thakur)

External Funding

2022–2026 **PSAP: Productive Spatial Accelerator Programming** **ETH Zürich**
EUR 2M; ERC Consolidator Grant

2022–2026 **Green responsibLe privACy preservIng dAta operaTIONs** **ETH Zürich**
CHF 404'980: Horizon 2021 EU Project

2022–2023 **Datacenter networking and secure communication** **ETH Zürich**
CHF 150'000: Intel donation (2x)

2021–2025 **The European PILOT** **ETH Zürich**
EUR 538'884: Euro HPC Project

2021–2024 **DaFIEx: Performance portability through dataflow extraction** **ETH Zürich**
CHF 519'906; ETH Future Computing Lab

2021–2024 **DaCeML - Harnessing future hardware using Data-Centric ML Integration** **ETH Zürich**
CHF 440'968, Platform for Advanced Scientific Computing

2021–2024 **MAELSTROM: Empowering Weather and Climate Forecast** **ETH Zürich**
EUR 606'000, Euro HPC Project, co-funded by SBFI

2021–2024 **DEEP SEA: Software for Exascale Architectures** **ETH Zürich**
EUR 297'136, Euro HPC Project, co-funded by SBFI

2021–2024 **RED SEA: Network Solution for Exascale Architectures** **ETH Zürich**
EUR 234'700, Euro HPC Project, co-funded by SBFI

2020–2021 **Automatic Dataflow Modeling for HPC Applications** **ETH Zürich**
CHF 99'992, SNF Spark (with Alexandru Calotoiu)

2018–2024 **EPI: The European Processor Initiative** **ETH Zürich**
EUR 1.82M; EU Horizon 2020, FET, (lead: Luca Benini, ETH)

2018–2021 **QIRO: An Intermediate Representation for Quantum Computing** **ETH Zürich**
$255'000; Gift by Microsoft in the context of the MSJRC joint lab

2018–2021 **PASCHA - Portability And Scalability of COSMO on Heterogeneous Architectures** **ETH Zürich**
CHF 494'300, Platform for Advanced Scientific Computing/HPCN

2018–2021 **EPIGRAM-HS: Enabling Extrame-scale Applications on Heterogeneous Hardware** **ETH Zürich**
EUR 371'000; EU Horizon 2020, FET, (lead: Stefano Markidis, KTH)

2018–2019 **Intel Parallel Computing Center** **ETH Zürich**
$200'000; Unrestricted gift by Intel Corp., extended into second year after evaluation

2017–2020 **Portability and Scalability of COSMO on Heterogeneous Architectures** **ETH Zürich**
CHF 494'300; Platform for Advanced Scientific Computing, led by MeteoSwiss

2017–2019 **Automatic Performance Modeling of HPC Applications with Multiple Model Parameters (Catwalk 2)** **ETH Zürich**
CHF 187,787; DFG Normal Antrag with TU Darmstadt (funded through DE-CH lead agency)

2014-2017 **Data Centric Mapping** **ETH Zürich**
$255'000; Gift by Microsoft in the context of the MSJRC joint lab

2015–2018 **Mont-Blanc 3, European scalable and power efficient HPC platform based on low-power embedded technology** **ETH Zürich**
EUR 396,350; EU Horizon 2020 - Excellent Science FET Proactive - with the MontBlanc 3 Consortium

2015–2018 **Cloud-reserving climate modeling on future supercomputing platform (crClim)** **ETH Zürich**
CHF 176,550; Swiss National Science Fund - Sinergia with D-USYS, MeteoSwiss, CSCS

2016–2021 **Data-Centric Parallel Programming (DAPP)** **ETH Zürich**
EUR 1.5M; ERC Starting Grant

2013–2017 **A Heterogeneous Compiler Platform for Scientific Codes** **ETH Zürich**
$649,713; Platform for Advanced Scientific Computing

2013–2016 **Data-Centric Compilation Techniques for Parallel Programs** **ETH Zürich**
$188,171; Swiss National Science Fund

2013–2016 **Google Ph.D. Fellowship for Maciej Besta** **ETH Zürich**
$255,000 unrestricted gift; First European Fellowship for Parallel Computing

2013 **Programming Hierarchical Memory Systems for Big Data Analytics** **ETH Zürich**
$30,000 unrestricted gift by IBM (faculty award)

2013–2016 **A Quick Development Path for Performance Models** **ETH Zürich**
ETH's share: $177,338; DFG Special Priority Programme SPPEXA (funded by SNF)

2011–2012 **Nonblocking Collective Operations for Portals IV** **University of Illinois**
$50,000 subcontract of Sandia National Laboratories, NNSA, DOE, to UIUC

2010–2013 **Compiled MPI: Cost-Effective Exascale Application Development** **University of Illinois**
UI's share: $165,000; funded under DOE X-Stack; in Collaboration with
Daniel Quinlan, Greg Bronevetsky (LLNL) and Andrew Lumsdaine (IU)

2005 **Quantum Mechanical Computations** **Chemnitz University of Technology**
€55,000; individual funding for Ph.D. studies received from AMD Saxony

Teaching Experience

(Co)taught 11 undergraduate courses, 14 graduate courses, 6 seminars, 35 tutorials, 10 PhD committees

Fall 2024 **Design of Parallel and High-Performance Computing** **ETH Zürich**
125 students (capped enrollment)

Spring 2024 **Parallel Programming** **ETH Zürich**
co-taught with Barbara Solenthaler, undergrad, 600 students

Fall 2023 **Design of Parallel and High-Performance Computing** **ETH Zürich**
125 students (capped enrollment)

Nov. 2023 **Full-day Tutorial: Advanced Parallel Programming with MPI** **SC23**
co-presented with P. Balaji, B. Gropp, R. Thakur, ≈ 55 attendees **Denver, CO**

Spring 2023 **Parallel Programming** **ETH Zürich**
co-taught with Barbara Solenthaler, undergrad, 570 students

Nov. 2022 **Full-day Tutorial: Advanced Parallel Programming with MPI** **SC22**
co-presented with P. Balaji, B. Gropp, R. Thakur, ≈ 60 attendees **Dallas, TX**

Nov. 2022 **Half-day Tutorial: Productive Parallel Programming for FPGA with HLS** **SC22**
co-presented with J. De Fine Licht, ≈ 50 attendees **virtual**

Jun. 2022 **Half-day Tutorial: Advanced Parallel Programming with MPI** **ISC'22**
co-presented with P. Balaji, ≈ 30 attendees **Hamburg, Germany**

Fall 2022 **Design of Parallel and High-Performance Computing** **ETH Zürich**
co-taught with Markus Pueschel, 125 students (capped enrollment)

Spring 2022	**Parallel Programming** *co-taught with Barbara Solenthaler*, undergrad, 550 students	**ETH Zürich**
Nov. 2021	**Full-day Tutorial: Advanced Parallel Programming with MPI** *co-presented with P. Balaji, B. Gropp, R. Thakur,* ≈ 60 *attendees*	**SC21** **St. Louis, MO**
Nov. 2021	**Half-day Tutorial: Productive Parallel Programming for FPGA with HLS** *co-presented with J. De Fine Licht,* ≈ 40 *attendees*	**SC21** **virtual**
Jun. 2021	**Half-day Tutorial: Advanced Parallel Programming with MPI** *co-presented with P. Balaji,* ≈ 30 *attendees*	**ISC'21** **Hamburg, Germany**
Fall 2021	**Design of Parallel and High-Performance Computing** *co-taught with Markus Pueschel*, 103 students	**ETH Zürich**
Spring 2021	**Parallel Programming** *co-taught with Barbara Solenthaler*, undergrad, 500 students	**ETH Zürich**
Nov. 2020	**Full-day Tutorial: Advanced Parallel Programming with MPI** *co-presented with P. Balaji, B. Gropp, R. Thakur,* ≈ 50 *attendees*	**SC20** **virtual**
Nov. 2020	**Half-day Tutorial: Productive Parallel Programming for FPGA with HLS** *co-presented with J. De Fine Licht,* ≈ 50 *attendees*	**SC20** **virtual**
Jun. 2020	**Half-day Tutorial: Advanced Parallel Programming with MPI** *co-presented with P. Balaji,* ≈ 30 *attendees*	**ISC'20** **virtual**
Fall 2020	**Design of Parallel and High-Performance Computing** *co-taught with Markus Pueschel*, 94 students	**ETH Zürich**
Spring 2020	**Parallel Programming** *co-taught with Hermann Lederer*, undergrad, 485 students	**ETH Zürich**
Nov. 2019	**Full-day Tutorial: Advanced Parallel Programming with MPI** *co-presented with P. Balaji, B. Gropp, R. Thakur,* ≈ 50 *attendees*	**SC19** **Denver, CO**
Nov. 2019	**Half-day Tutorial: Productive Parallel Programming for FPGA with HLS** *co-presented with J. De Fine Licht,* ≈ 50 *attendees*	**SC19** **Denver, CO**
Jun. 2019	**Half-day Tutorial: Advanced Parallel Programming with MPI** *co-presented with P. Balaji,* ≈ 30 *attendees*	**ISC'19** **Frankfurt, Germany**
Spring 2019	**Parallel Programming** *co-taught with Martin Vechev*, undergrad, ≈ 400 students	**ETH Zürich**
Fall 2018	**Design of Parallel and High-Performance Computing** *co-taught with Markus Pueschel* ≈ 60 students	**ETH Zürich**
Nov. 2018	**Full-day Tutorial: Advanced Parallel Programming with MPI** *co-presented with P. Balaji, B. Gropp, R. Thakur,* ≈ 70 *attendees*	**SC18** **Dallas, TX**
Nov. 2018	**Half-day Tutorial: Productive Parallel Programming for FPGA with HLS** *co-presented with J. De Fine Licht,* ≈ 50 *attendees*	**SC18** **Dallas, TX**
Jun. 2018	**Half-day Tutorial: Advanced Parallel Programming with MPI** *co-presented with P. Balaji,* ≈ 35 *attendees*	**ISC'18** **Frankfurt, Germany**
Spring 2018	**Parallel Programming** *co-taught with Martin Vechev*, undergrad, ≈ 400 students	**ETH Zürich**
Fall 2017	**Design of Parallel and High-Performance Computing** *co-taught with Markus Pueschel* ≈ 50 students	**ETH Zürich**
Nov. 2017	**Full-day Tutorial: Advanced Parallel Programming with MPI** *co-presented with P. Balaji, B. Gropp, R. Thakur,* ≈ 70 *attendees*	**SC17** **Denver, CO**
Jun. 2017	**Half-day Tutorial: Advanced Parallel Programming with MPI** *co-presented with P. Balaji,* ≈ 35 *attendees*	**ISC'17** **Frankfurt, Germany**

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Spring 2017	**Parallel Programming** *co-taught with Martin Vechev*, undergrad, ≈ 400 students	**ETH Zürich**
Fall 2016	**Design of Parallel and High-Performance Computing** *co-taught with Markus Pueschel* ≈ 40 students	**ETH Zürich**
Nov. 2016	**Full-day Tutorial: Advanced Parallel Programming with MPI** *co-presented with P. Balaji, B. Gropp, R. Thakur,* ≈ 70 *attendees*	**SC16** **Salt Lake City, UT**
Jun. 2016	**Full-day Tutorial: Advanced Parallel Programming with MPI** *co-presented with P. Balaji,* ≈ 30 *attendees*	**ISC'16** **Frankfurt, Germany**
Nov. 2015	**Full-day Tutorial: Advanced Parallel Programming with MPI** *co-presented with P. Balaji, B. Gropp, R. Thakur,* ≈ 70 *attendees*	**SC15** **Austin, TX**
Nov. 2015	**Half-day Tutorial: Insightful Automatic Performance Modeling** *co-presented with A. Calotoiu, M. Schulz, F. Wolf,* ≈ 30 *attendees*	**SC15** **Austin, TX**
Sep. 2015	**Half-day Tutorial: Insightful Automatic Performance Modeling** *co-presented with A. Calotoiu, M. Schulz, F. Wolf,* ≈ 20 *attendees*	**EuroMPI'15** **Bordeaux, France**
Sep. 2015	**Full-day Tutorial: Advanced Parallel Programming with MPI** ≈ 20 *attendees*	**Speedup'15** **Lugano, Switzerland**
Fall 2015	**Design of Parallel and High-Performance Computing** *co-taught with Markus Pueschel* ≈ 40 students	**ETH Zürich**
Jun. 2015	**Half-day Tutorial: Advanced Parallel Programming with MPI** *co-presented with P. Balaji,* ≈ 40 *attendees*	**ISC'15** **Frankfurt, Germany**
Spring 2015	**Operating Systems and Networks** *co-taught with Adrian Perrig*, undergrad, ≈ 140 students	**ETH Zürich**
Spring 2015	**Computational Science**, *Seminar* *co-taught with Peter Arbenz & Petros Koumoutsakos,* ≈ 15 *students*	**ETH Zürich**
Spring 2015	**Research Topics in Software Engineering**, *Seminar* ≈ 25 *students*	**ETH Zürich**
Fall 2014	**Design of Parallel and High-Performance Computing** *co-taught with Markus Pueschel* ≈ 40 students	**ETH Zürich**
Nov. 2014	**Full-day Tutorial: Advanced Parallel Programming with MPI** *co-presented with P. Balaji, B. Gropp, R. Thakur,* ≈ 120 *attendees*	**SC14** **Denver, CO, USA**
Sep. 2014	**Full-day Tutorial: Advanced Parallel Programming with MPI** invited lecturer ≈ 50 *attendees*	**EuroMPI/Asia 2014** **Kobe, Japan**
Fall 2013	**Design of Parallel and High-Performance Computing** *co-taught with Markus Pueschel* ≈ 35 students	**ETH Zürich**
Jun. 2014	**Full-day Tutorial: Advanced Parallel Programming with MPI** *co-presented with Pavan Balaji,* ≈ 15 *attendees*	**ISC'13** **Leipzig, Germany**
Spring 2014	**Operating Systems and Networks** *co-taught with Adrian Perrig*, undergrad, ≈ 130 students	**ETH Zürich**
Spring 2014	**Computational Science**, *Seminar* *co-taught with Peter Arbenz & Petros Koumoutsakos,* ≈ 10 *students*	**ETH Zürich**
Nov. 2013	**Tutorial: Advanced Parallel Programming with MPI** *co-presented with Pavan Balaji, Rajeev Thakur, James Dinan* ≈ 50 attendees	**SC13** **Denver, CO, USA**
Fall 2013	**Design of Parallel and High-Performance Computing** *co-taught with Markus Pueschel* ≈ 25 students	**ETH Zürich**
Fall 2013	**Research Topics in Software Engineering**, *Seminar* *co-taught with Martin Vechev* ≈ 20 students	**ETH Zürich**
Jul. 2013	**MPI Programming** Invited lecturer at CHPC Winter School, ≈ 65 students	**University of Johannesburg** **Johannesburg, South Africa**

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Jun. 2013	**Tutorial: Advanced Parallel Programming with MPI** *co-presented with Pavan Balaji & Martin Schulz,* ≈ 15 *attendees*	**ISC'13** **Leipzig, Germany**
Jun. 2013	**Tutorial: Advanced Parallel Programming with MPI** *co-presentad with Pavan Balaji,* ≈ 25 *attendees*	**ICS'13** **Eugene, OR, USA**
Spring 2013	**Operating Systems and Networks** *co-taught with Donald Kossmann*, undergrad, ≈ 130 students	**ETH Zürich**
Spring 2013	**Computational Science**, *Seminar* *co-taught with Peter Arbenz & Petros Koumoutsakos,* ≈ 5 *students*	**ETH Zürich**
Feb 24	**Tutorial: MPI & Advanced Parallel Programming** *co-presentad with Pavan Balaji*	**PPoPP'13** **Shenzen, China**
Fall 2012	**Design of Parallel and High-Performance Computing** *co-taught with Thomas Gross & Markus Pueschel*, ≈ 25 students	**ETH Zürich**
Fall 2012	**Computational Science**, *Seminar* *co-taught with Peter Arbenz & Petros Koumoutsakos*, ≈ 5 students	**ETH Zürich**
Jun 17	**Tutorial: Next Generation MPI Programming** *co-presented with Martin Schulz*, ≈ 25 attendees	**ISC'12** **Hamburg, Germany**
May 23-15	**Tutorial: Advanced Distributed Memory Parallel Programming** Advanced Distributed Memory Parallel Programming: MPI-2.2, MPI 3.0 and PGAS, ≈ 35 attendees	**CSCS**
Spring 2011	**Hot Topics in HPC: Networks and Fault tolerance**, *CS498* (4cr grad./3cr undergrad.), *co-taught with Franck Cappello*, ≈ 25 students	**University of Illinois**

Advising and Mentoring

I advise(d) 26 Ph.D. students and more than 100 M.Sc. students, of which three (Patrick Iff, Marc Fischer, Cedric Renggli) received the ETH Medal for their thesis. I mentor(ed) 14 postdocs (seven with an ETH Fellowship) and hosted two SNSF Ambizione fellows (Tobias Grosser, Tal Ben-Nun) in my group.

Postdocs (chronologically) **ETH Zürich**

Sabela Ramos (ETH Fellow)
Pierre Jolivet (ETH Fellow)
Tobias Grosser
Edgar Solomonik (ETH Fellow)
Tal Ben-Nun (ETH Fellow)
Tiziano De Matteis
Nikoli Dryden (ETH Fellow)
Shigang Li
Tobias Gysi
Alexandru Calotoiu
Daniele De Sensi (ETH Fellow)
Kazuki Osawa (ETH Fellow)
Nabil Abubaker (SNSF Fellow)
Marcin Copik

PhD Students (chronologically) **ETH Zürich**
Maciej Besta (graduated 2022)
Tobias Gysi (graduated 2020)
Bogdan Prisacari (graduated 2020)
Salvatore di Girolamo (graduated 2021)
Grzegorz Kwasniewski (graduated 2022)
Konstantin Taranov (graduated 2022)
Johannes de Fine Licht (graduated 2022)
Alexandros Nikolaos Ziogas (graduated 2023)
Niels Gleinig (graduated 2023)
Marcin Copik (graduated 2024)
Lukas Gianinazzi (graduated 2024)
Andrei Ivanov
Saleh Ashkboos
Philipp Schaad
Langwen Huang
Marcin Chrapek
Patrick Iff
Mikhail Khalilov
Siyuan Shen
Patrik Okanovic
Yakup Budanaz
Tiancheng Chen
Afif Badaoud
Pratyai Mazumder
Tomasz Sternal
Jiayong Li
Afif Badaoud
Pratyai Mazumder

Student Cluster Challenge

I am passionate about fostering young talent and encourage all undergraduate students to participate in the student cluster challenge competition. My teams have twice been among the winners!

2020-today **Advisor** **ETH Zurich**
ETH's Team Racklette participates in the Cluster Challenge competitions at SC and ISC
Preparing the (often winning) ETH team of undergraduate students for the challenge. See section "Awards of Mentees" for details on prizes won.

2019 **Advisor** **ETH Zurich**
Cluster Challenge Preparation
Preparing the (winning) ETH team of undergraduate students for the challenge at ISC'19.

2008 **Co-Advisor** **Indiana University**
Cluster Challenge Preparation
Preparing the (winning) IU/TUD team of undergraduate students for the challenge at SC'08

2007 **Co-Advisor** **Indiana University**
Cluster Challenge Preparation
Preparing the IU team of undergraduate students for the challenge at SC'07.

Service

Leadership Service

2019-now **German Helmholtz AI review board**, *External scientific advisor (yearly)*
2022 **IEEE Cluster 2022**, *Program Co-Chair*
2021 **German BMBF Quantum Centers Review Board**, *External scientific advisor*
2019–2020 **SCXY**, *IEEE/ACM Supercomputing Steering Committee*
2010–now **MPI Forum Meetings**, *MPI-3 Working Group for Collective Operations and Topology*

2012–now **Green Graph 500**, *chair the Green Graph 500 list of the greenest data analytics machines.*

2014–now **Workshop on High-Performance Interconnects in the Exascale and Big-Data**, *Steering Committee*

2014–2017 **Platform for Advanced Scientific Computing Conference**, *Steering Committee*

EuroMPI'19 **European Conference on MPI (EuroMPI)**, *General Chair*

SC18 **IEEE/ACM Supercomputing**, *Papers Chair*

ACM PASC'17 **ACM Platform for Advanced Scientific Computing Conference**, *Program Co-Chair*

ICPP'17 **International Conference on Parallel Processing**, *Area Co-Chair*

IPDPS'17 **International Parallel & Distributed Processing Symposium**, *Technical Area Chair*

ACM PASC'16 **ACM Platform for Advanced Scientific Computing Conference**, *Program Co-Chair*

SC15 **IEEE/ACM Supercomputing**, *Panels Co-Chair*

HOTI'14 **IEEE Hot Interconnects**, *Tutorials Co-Chair*

SIAM PP'14 **SIAM Parallel Processing**, *Member of the Organizing Committee*

HOTI'13 **IEEE Hot Interconnects**, *General Co-Chair*

SC13 **IEEE/ACM Supercomputing**, *Emerging Technologies Chair*

EuroPar'13 **European Conference on Parallel Processing**, *Local Topic Chair for High-Performance Networks and Communication*

HOTI'12 **IEEE Hot Interconnects**, *Program Chair*

SC12 **IEEE/ACM Supercomputing**, *Technical Posters Chair*

HIPS'11 **16th International Workshop on High-Level Parallel Programming Models and Supportive Environments**, *General Chair*

HOTI'11 **IEEE Hot Interconnects**, *Program Co-Chair*

HOTI'10 **IEEE Hot Interconnects**, *Tutorials Chair*

Standardization Committees

2023–present **Ultra Ethernet**, *Co-chair of the Ultra Ethernet Transport Working Group (elected)*

2012–present **MPI Forum**, *Representing ETH Zurich, Chair of the Collective Operations and Topology Working Group for MPI-3.1*

2010–2012 **MPI Forum**, *Representing University of Illinois at Urbana-Champaign, Chair of the Collective Operations and Topology Working Group for MPI-3*

2007–2010 **MPI Forum**, *Representing Indiana University, Chair of the Collective Operations Working Group, Co-Author of the Chapter 5 (Collective Communication) and Chapter 7 (Process Topologies) in MPI-2.2*

Journal Editorial Boards

2014–present **Subject Area Editor** **SuperFri**
Supercomputing Frontiers and Innovations

2014–present **Associate Editor** **IEEE TPDS**
IEEE Transactions on Parallel and Distributed Systems

2013–present **Associate Editor** **PARCO**
Elsevier Parallel Computing Journal

2012–present **Associate Editor** **IJHPCA**
SAGE International Journal of High Performance Computing Applications

Organized Workshops

Co-Chair of Intl. Workshop on Runtime and Operating Systems for Supercomputers (ROSS), *Organized in conjunction with ACM ICS or ACM HPDC annually from 2011-present*

16th International Workshop on High-Level Parallel Programming Models and Supportive Environments (HIPS'11), *Organized in conjunction with IEEE IPDPS'11, Anchorage, AL, USA, 2011*

1st Blue Waters Performance Modeling Workshop, *Organized a performance modeling workshop with speakers from the Los Alamos National Laboratory for early users of the Blue Waters Petascale system, Urbana, IL, 2010*

3rd KiCC Workshop, *Co-Organized 3rd workshop on Kommunikation in Clusterrechnern und Clusterverbundsystemen, Aachen 2007*

2nd KiCC Workshop, *Co-Organized 2nd workshop on Kommunikation in Clusterrechnern und Clusterverbundsystemen, Chemnitz 2007*

1st KiCC Workshop, *Co-Organized 1st workshop on Kommunikation in Clusterrechnern und Clusterverbundsystemen, Chemnitz 2005*

Significant Project Involvement

Research Projects

2018–today **Microsoft Maia**, *AI Supercomputing System (Chip, Rack-Level, System-level co-design from ground up for AI workloads)*

2010–2013 **NSF Blue Waters**, *Sustained Petaflop Computing with the Blue Waters machine. Responsible for Modelling and Simulation of Parallel Petaflop Applications*

2008–2010 **DOE CIFTS**, *Coordinated and Improved Fault Tolerance for High Performance Computing Systems*

2007–2010 **DOE FAST-OS II**, *Forum to Address Scalable Technology for Runtime and Operating Systems*

2005–2006 **CHiC**, *Co-Design and Procurement of the Chemnitzer Hochleistungs-Linux-Cluster, project volume 2.6 + 1.7 Million Euro, 528 diskless InfiniBand nodes, 8.2 TFlop/s (73.4% HPL efficiency) #117 in Top 500 June 2007*