Erin Claire Carson

Curriculum Vitae

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Education

2009–2015 Ph.D. in Computer Science, with a Designated Emphasis in Computational and Data Science and Engineering, University of California Berkeley.

2005–2009 B.S. in Computer Science, with Minors in Applied Mathematics and Materials Science, University of Virginia.

PhD Thesis

Title *Communication-avoiding Krylov Subspace Methods in Theory and Practice*

Supervisors Professor James Demmel & Professor Armando Fox

Description This thesis evaluates tradeoffs between performance and accuracy in communication-avoiding Krylov subspace methods for high-performance scientific codes.

Professional Appointments

2025– Associate Professor with Tenure, Department of Numerical Mathematics, Faculty of Mathematics and Physics, Charles University.

2022–2025 Assistant Professor, Department of Numerical Mathematics, Faculty of Mathematics and Physics, Charles University.

2019–2022 PRIMUS Research Fellow, Department of Numerical Mathematics, Faculty of Mathematics and Physics, Charles University.

2018–2019 Postdoctoral Researcher, Department of Numerical Mathematics, Faculty of Mathematics and Physics, Charles University.

2015–2018 Courant Instructor/Assistant Professor, Courant Institute of Mathematical Sciences, New York University.

Grants

2023–2028 Principal Investigator, "Analyzing and Exploiting Inexactness in Exascale Matrix Computations", ERC Starting Grant No. 101075632, European Research Council (≈ 1,500,000 EUR).

2020–2023 Principal Investigator/Subcontractor, "Mixed Precision Numerical Linear Algebra", Subcontract Awards B639388, B644596 and B650935, U.S. Exascale Computing Project (Primary award 17-SC-20-SC), LLNL - Charles University (≈ 190,000 EUR).

2019–2022 Principal Investigator of the PRIMUS Research Project PRIMUS/19/SCI/11, "Scalable and Accurate Numerical Linear Algebra for Next-Generation Hardware", Charles University (≈ 345,000 EUR).

Publications

Journal Papers

2026– T. Bake, E. Carson, and Y. Ma, *Forward and Backward Error Bounds for a Mixed Precision Preconditioned Conjugate Gradient Algorithm*, Numerische Mathematik (accepted; in press).

2026 E. Carson, X. Chen, and X. Liu, *Computing k-means in Mixed Precision*, SIAM Journal on Scientific Computing (accepted; in press).

2026 P. Vacek, H. Anzt, E. Carson, N. Kohl, U. Rüde, and Y.H. Tsai, *Mixed Precision Multigrid with Smoothing Based on Incomplete Cholesky Factorization*, SIAM Journal on Scientific Computing (accepted; in press).

2026 L. Burke, E. Carson, and Y. Ma, *On the Numerical Stability of Sketched GMRES*, SIAM Journal on Matrix Analysis and Applications, 47(3), pp. 1657-1678.

2026 E. Carson and X. Chen, *pychop: Emulating Low-Precision Arithmetic in Numerical Methods and Neural Networks*, ACM Transactions on Mathematical Software (accepted; in press).

2026 E. Carson, X. Chen, and C. Kang, *LLM-ABBA: Understanding Time Series via Symbolic Approximation*, IEEE Transactions on Signal Processing, vol. 74, 2026, pp. 1218-1232.

2026 E. Carson, K. Lund, Y. Ma, and E. Oktay, *On the Loss of Orthogonality in Low-Synchronization Variants of Reorthogonalized Block Classical Gram-Schmidt*, Linear Algebra and its Applications, 732, 2026, pp. 162-206.

2026 J. Martínek, E. Carson, and R. Scheichl, *Exploiting Inexact Computations in Multilevel Monte Carlo and Other Sampling Methods*, SIAM Journal on Scientific Computing, 48(2), pp.B141-B164.

2026 E. Carson and J. Hercík, *The Detection and Correction of Silent Errors in Pipelined Krylov Subspace Methods*, Numerical Algorithms, vol. 101, 2026, pp. 1175-1210.

2025 N. Khan and E. Carson, *Mixed Precision Iterative Refinement with Adaptive Precision Sparse Approximate Inverse Preconditioning*, Engineering with Computers, 2025, pp. 1-14.

2025 E. Carson and I. Daužickaitė, *Mixed Precision Sketching for Least-Squares Problems and its Application in GMRES-Based Iterative Refinement*, SIAM Journal on Matrix Analysis and Applications, 46(3), 2025, pp. 2041-2060.

2025 E. Carson and Y. Ma, *On the Backward Stability of s-step GMRES*, SIAM Journal on Matrix Analysis and Applications, 46(3), 2025, pp. 2008-2040.

2025 E. Carson and Y. Ma, *A Stable One-Synchronization Variant of Reorthogonalized Block Classical Gram-Schmidt*, SIAM Journal on Scientific Computing, 47(4), 2025, pp. A2353-2377.

2025 E. Carson, X. Chen, and X. Liu, *Mixed Precision HODLR Matrices*, SIAM Journal on Scientific Computing, 47(3), 2025, pp. A1408-A1435..

2025 E. Carson and I. Daužickaitė, *A Comparison of Mixed Precision Iterative Refinement Approaches for Least-Squares Problems*, SIAM Journal on Matrix Analysis and Applications, 46(2), 2025, pp. 1117-1144.

2025 E. Carson, K. Lund, Y. Ma, and E. Oktay, *Reorthogonalized Pythagorean Variants of Block Classical Gram-Schmidt*, SIAM Journal on Matrix Analysis and Applications, 46(1), 2025, pp. 310-340.

2024 P. Vacek, E. Carson, and K. M. Soodhalter, *The Effect of Approximate Coarsest-Level Solves on the Convergence of Multigrid V-Cycle Methods*, SIAM Journal on Scientific Computing, 46(4), 2024, pp. A2634-A2659.

2024 E. Carson, J. Liesen, and Z. Strakoš, *Towards Understanding CG and GMRES Through Examples*, Linear Algebra and its Applications, 692, 2024, pp. 241-291.

2024 E. Carson and I. Daužickaitė, *Single-pass Nyström Approximation in Mixed Precision*, SIAM Journal on Matrix Analysis and Applications, 45(3), 2024, pp. 1361-1391.

2024 E. Carson and I. Daužickaitė, *The Stability of Split-Preconditioned FGMRES in Four Precisions*, Electronic Transactions on Numerical Analysis, 60, 2024, pp. 40-58.

2024 E. Oktay and E. Carson, *Mixed Precision Rayleigh Quotient Iteration for Total Least Squares Problems*, Numerical Algorithms, 96(2), 2024, pp. 777-798.

2024 S. Thomas, E. Carson, M. Rozložník, A. Carr, and K. Świrydowicz, *Iterated Gauss-Seidel GMRES*, SIAM Journal on Scientific Computing, 46(2), 2024, pp. S254-S279.

2023 E. Carson and N. Khan, *Mixed Precision Iterative Refinement with Sparse Approximate Inverse Preconditioning*, SIAM Journal on Scientific Computing, 45(3), 2023, pp. C131-C153.

2022 E. Oktay and E. Carson, *Multistage Mixed Precision Iterative Refinement*, Numerical Linear Algebra with Applications, 2022, e2434.

2022 E. Carson, K. Lund, M. Rozložník, and S. Thomas, *Block Gram-Schmidt Algorithms and their Stability Properties*, Linear Algebra and its Applications, 638, 2022, pp. 150-195.

2021 E. Carson, T. Gergelits, and I. Yamazaki, *Mixed Precision s-step Lanczos and Conjugate Gradient Algorithms*, Numerical Linear Algebra with Applications, 2021, e2425.

2021 E. Carson, K. Lund, and M. Rozložník, *The Stability of Block Variants of Classical Gram-Schmidt*, SIAM Journal on Matrix Analysis and Applications, 42(3), 2021, pp. 1365-1380.

2021 A. Abdelfattah, H. Anzt, E. G. Boman, E. Carson, et al., *A Survey of Numerical Methods Utilizing Mixed Precision Arithmetic*, International Journal of High Performance Computing Applications, 35(4), 2021, pp. 344-369.

2020 E. Carson, N. J. Higham, and S. Pranesh, *Three-Precision GMRES-Based Iterative Refinement for Least Squares Problems*, SIAM Journal on Scientific Computing, 42(6), 2020, pp. A4063-A4083.

2020 T. Chen and E. Carson, *Predict-and-Recompute Conjugate Gradient Variants*, SIAM Journal on Scientific Computing, 42(5), 2020, pp. A3084-A3108.

2020 E. Carson, *An Adaptive s-step Conjugate Gradient Algorithm with Dynamic Basis Updating*, Applications of Mathematics, 65(2), 2020, pp. 123-151.

2020 E. Carson and Z. Strakoš, *On the Cost of Iterative Computations*, Philosophical Transactions of the Royal Society A, 378(2166), 2020.

2018 E. Carson, M. Rozložník, Z. Strakoš, P. Tichý, and M. Tůma, *The Numerical Stability Analysis of Pipelined Conjugate Gradient Methods: Historical Context and Methodology*, SIAM Journal on Scientific Computing, 40(5), 2018, pp. A3549-3580.

2018 E. Carson, *The Adaptive s-step Conjugate Gradient Method*, SIAM Journal on Matrix Analysis and Applications, 39(3), 2018, pp. 1318-1338.

2018 E. Carson and N. Higham, *Accelerating the Solution of Linear Systems by Iterative Refinement in Three Precisions*, SIAM Journal on Scientific Computing, 40(2), 2018, pp. A817-A847 .

2017 E. Carson and N. Higham, *A New Analysis of Iterative Refinement and its Application to Accurate Solution of Ill-Conditioned Sparse Linear Systems*, SIAM Journal on Scientific Computing, 39(6), 2017, pp. A2834-A2856.

2016 E. Solomonik, E. Carson, N. Knight, and J. Demmel, *Tradeoffs between Synchronization, Communication, and Computation in Parallel Linear Algebra Computations*, ACM Transactions on Parallel Computing, 3(1), 2016, pp. 3:1-3:47.

2015 E. Carson and J. Demmel, *Accuracy of the s-Step Lanczos Method for the Symmetric Eigenproblem in Finite Precision*, SIAM Journal on Matrix Analysis and Applications, 36(2), 2015, pp. 793-819.

2014 E. Carson, N. Knight, and J. Demmel, *An Efficient Deflation Technique for the Communication-Avoiding Conjugate Gradient Method*, Electronic Transactions on Numerical Analysis, 43, 2014, pp. 125-141.

2014 G. Ballard, E. Carson, J. Demmel, M. Hoemmen, N. Knight, and O.Schwartz, *Communication Lower Bounds and Optimal Algorithms for Numerical Linear Algebra*, Acta Numerica, 23, 2014, pp. 1-155.

2014 N. Knight, E. Carson and J. Demmel, *Exploiting Data Sparsity in Parallel Matrix Powers Computations*, in Parallel Processing and Applied Mathematics, R. Wyrzykowski, J. Dongarra, K. Karczewski, and J. Waniewski, eds., Lecture Notes in Computer Science, 8384, Springer Berlin Heidelberg, 2014, pp. 15-25.

2014 E. Carson and J. Demmel, *A Residual Replacement Strategy for Improving the Maximum Attainable Accuracy of s-Step Krylov Subspace Methods*, SIAM Journal on Matrix Analysis and Applications, 35(1), 2014, pp. 22-43.

2013 E. Carson, N. Knight, and J. Demmel, *Avoiding Communication in Nonsymmetric Lanczos-based Krylov Subspace Methods*, SIAM Journal on Scientific Computing, 35(5), 2013, pp. S42-S61.

Conference Proceedings

2025 E. Carson and E. Oktay, *Mixed Precision FGMRES-Based Iterative Refinement for Weighted Least Squares*, In European Conference on Numerical Mathematics and Advanced Applications (ENUMATH 2023), 2025, pp. 229-238.

2023 E. Oktay and E. Carson, *Using Mixed Precision in Low-Synchronization Reorthogonalized Block Classical Gram-Schmidt*, In Proceedings in Applied Mathematics and Mechanics, 23, 2023, e202200060.

2023 E. Oktay and E. Carson, *Mixed Precision GMRES-Based Iterative Refinement with Recycling*, In Proceedings of Programs and Algorithms of Numerical Mathematics, 21, 2023, pp. 149-162.

2022 E. Carson, B. Kelley, and I. Yamazaki, *Mixed Precision s-step Conjugate Gradient with Residual Replacement on GPUs*, in Proceedings of the 36th IEEE International Parallel and Distributed Processing Symposium (IPDPS), 2022, pp. 886-896.

2016 E. Carson, J. Demmel, L. Grigori, N. Knight, P. Koanantakool, O. Schwartz, O. H.V. Simhadri, *Write-Avoiding Algorithms*, in Proceedings of the 30th IEEE International Parallel and Distributed Processing Symposium (IPDPS), 2016, pp. 648-658.

2014 E. Solomonik, E. Carson, N. Knight, and J. Demmel, *Tradeoffs Between Synchronization, Communication, and Work in Parallel Linear Algebra Computations*, in Proceedings of the 26th ACM Symposium on Parallelism in Algorithms and Architectures (SPAA), 2014, pp. 307-318.

2014 S. Williams, E. Carson, M. Lijewski, N. Knight, A. Almgren, B. Van Straalen, and J. Demmel, *s-Step Krylov Subspace Methods as Bottom Solvers for Geometric Multigrid*, in Proceedings of the 28th IEEE International Parallel and Distributed Processing Symposium (IPDPS), 2014, p.. 1149-1158.

2007 J. Carnahan, S. Policastro, E. Carson, P. Reynolds Jr., and R. Kelly, *Using Flexible Points in a Developing Simulation of Selective Dissolution in Alloys*, in Proceedings of the 39th Winter Simulation Conference, IEEE Press, 2007, pp. 891-899.

Presentations

Invited Plenary, Keynote, and Panelist Talks

2027 **Plenary Talk:** SIAM Conference on Applied Linear Algebra (LA27), Long Beach, California, USA, May 24-28, 2027.

2026 **Plenary Talk:** 33rd IEEE International Symposium on Computer Arithmetic (ARITH 2026), Fulda, Germany, June 28 - July 1, 2026.

2026 **Plenary Talk:** High-Performance Computing in Science and Engineering (HPCSE26), Soláň, Czech Republic, May 18-21, 2026.

2025 **Plenary Talk:** The European Conference on Numerical Mathematics and Advanced Applications (ENUMATH), Heidelberg, Germany, September 1-5, 2025.

2025 **Plenary Talk:** 29th International Conference on Domain Decomposition Methods, Milan, Italy, June 23-27, 2025.

2024 **Ceremonial Lecture:** "Balancing Inexactness in Matrix Computations", Jarník Lecture, Prague, Czech Republic, October 9, 2024.

2024 **Plenary Talk:** "Inexact Matrix Computations", 12th Conference on Applied Mathematics and Scientific Computing, Dubrovnik, Croatia, September 25, 2024.

2023 **Plenary Talk:** "Balancing Inexactness in Matrix Computations", 25th Conference of the International Linear Algebra Society (ILAS), Madrid, Spain, June 15, 2023.

2022 **Plenary Talk:** "Mixed Precision Iterative Refinement", XXI Householder Symposium on Numerical Linear Algebra, Selva di Fasano, Italy, June 16, 2022.

2022 **Plenary Talk:** "Opportunities for Mixed Precision in Preconditioned Iterative Methods", International Conference on Preconditioning Techniques for Scientific and Industrial Applications (Preconditioning 2022), Chemnitz, Germany, June 9, 2022.

2019 **Invited Panelist:** "The Road to Exascale and Beyond Is Paved by Software: How Algorithms, Libraries and Tools Will Make Exascale Performance Real", IEEE International Conference for High Performance Computing, Networking, Storage and Analysis (Supercomputing '19), November 17-22, 2019.

2019 **Keynote Talk:** "Iterative Refinement in Three Precisions", 3rd Workshop on Power-Aware Computing (PACO '19), Magdeburg, Germany, November 5-6, 2019.

2019 **Keynote Talk:** "The Cost of Iterative Computations", High-Performance Computing in Science and Engineering (HPCSE19), Soláň, Czech Republic, May 20-23, 2019.

2017 **Plenary Talk:** "The Behavior of Synchronization-Reducing Variants of the Conjugate Gradient Method in Finite Precision", Householder Symposium XX, Blacksburg, Virginia, June 19, 2017.

2017 **Plenary Talk:** "High-Performance Krylov Subspace Method Variants and their Behavior in Finite Precision", High Performance Computing in Science and Engineering (HPCSE17), Soláň, Czech Republic, May 24, 2017.

Selection of Other Invited Talks

2026 **Invited Talk:** "Mixed Precision Computing: High Accuracy with Low Precision", FPTalks 2026, Online, August 6, 2026.

2026 **Invited Talk:** "Mixed Precision Computing: High Accuracy with Low Precision", Foundations of Computational Mathematics, Workshop on Numerical Linear Algebra, Vienna, Austria, July 16-18, 2026.

2026 **Invited Seminar Talk:** "Mixed-Precision Computing: High Accuracy With Low Precision", Langtangen Seminar on Scientific Computing, Simula Research Laboratory (online), May 12, 2026.

2024 **Invited Talk:** "Balancing Inexactness in Large-Scale Matrix Computations", Nordic Numerical Linear Algebra Meeting, University of Southern Denmark, Odense, June 17, 2024.

2023 **Invited Seminar Talk:** "Balancing Inexactness in Matrix Computations", SimTech/Math Colloquium, University of Stuttgart, July 13, 2023.

2023 **Invited Seminar Talk:** "Balancing Inexactness in Matrix Computations", Computational Mathematics and Applications Seminar, Mathematical Institute, University of Oxford, May 25, 2023.

2023 **Invited Seminar Talk:** "Using Mixed Precision in Numerical Linear Algebra", Faculty of Nuclear Sciences and Physical Engineering, Czech Technical University, Prague, CZ, March 27, 2023.

2023 **Invited Seminar Talk:** "70 Years of Krylov Subspace Methods", Mathematics Seminar, Trinity College Dublin, January 25, 2023.

2022 **Invited Seminar Talk:** "Improving the Numerical Behavior of Communication-Avoiding Krylov Subspace Methods", Faculty of Computer Science Seminar, University of Vienna, September 1, 2022.

2022 **Invited Talk:** "Recent Progress in Mixed Precision Numerical Linear Algebra", Advances in Numerical Linear Algebra: Celebrating the 60th Birthday of Nick Higham, Manchester, UK, July 8, 2022.

2022 **Invited Seminar Talk:** "Challenges and Opportunities in Mixed Precision Numerical Linear Algebra", Innovative Computing Laboratory, University of Tennessee, online, May 13, 2022.

2022 **Invited Talk:** "Exploiting Mixed Precision in Numerical Linear Algebra", 47th Annual University of Arkansas Spring Lecture Series: Numerical Linear Algebra: from Scientific Computing to Data Science Applications, University of Arkansas, May 4, 2022.

2021 **Invited Talk:** "High Performance Mixed Precision Numerical Linear Algebra", Numerical Methods and High Performance Computing for industrial applications (SimRace), IFP Energies Nouvelles, France, December 3, 2021.

2021 **Invited Seminar Talk:** "Exploiting Mixed Precision in Numerical Linear Algebra", MATH-ICSE Seminar Series, EPFL, Switzerland, November 2, 2021.

2021 **Invited Seminar Talk:** "Exploiting Mixed Precision in Numerical Linear Algebra", Center for Control, Dynamical Systems, and Computation (CCDC) Seminar Series, U.C. Santa Barbara, online, October 29, 2021.

2021 **Invited Seminar Talk:** "The Cost of Iterative Computations at Scale", Irish Numerical Analysis Forum, Trinity College Dublin, online, July 1, 2021.

2021 **Invited Seminar Talk:** "What Do We Know About Block Gram-Schmidt?", E-NLA Seminar, online, February 24, 2021.

2020 **Invited Seminar Talk:** "High Performance Mixed Precision Numerical Linear Algebra", Scientific Computing and Numerics (SCAN) Seminar, Cornell University, online, November 9, 2020.

2020 **Invited Seminar Talk:** "High Performance Mixed Precision Numerical Linear Algebra", Numerical Mathematics (NUMA) Seminar, KU Leuven, online, October 29, 2020.

2019 **Invited Talk:** "The Cost of Iterative Computations", Advanced Solvers for Modern Architectures, Muenster, Germany, November 11-13, 2019.

2019 **Invited Talk:** "Iterative Linear Algebra in the Exascale Era", Numerical Algorithms for High-Performance Computational Science, The Royal Society, London, UK, April 8-9, 2019.

2019 **Invited Lectures:** "High Performance Variants of Krylov Subspace Methods, Parts I and II", Seminar on Numerical Analysis and Winter School, Ostrava, Czech Republic, January 21-25, 2019.

2017 **Invited Seminar Talk:** "Communication-Avoiding Algorithms: Challenges and New Results", Numerical Analysis and Scientific Computing Seminar, University of Manchester, UK, July 19, 2017.

2017 **Invited Seminar Talk:** "High-Performance Krylov Subspace Method Variants and their Behavior in Finite Precision", MORE Seminar, Charles University, Prague, Czech Republic, May 15, 2017.

2016 **Invited Seminar Talk:** "Performance and Stability Tradeoffs in Large-Scale Krylov Subspace Methods", Applied Mathematics and Scientific Computing Seminar, Temple University, November 16, 2016.

2014 **Invited Seminar Talk:** "Communication-Avoiding Krylov Subspace Methods in Finite Precision", Linear Algebra and Optimization Seminar, ICME, Stanford University, December 4, 2014.

Honors and Awards

2025 **Neuron Award for Promising Scientists in Mathematics**.

2025 **James H. Wilkinson Prize in Numerical Analysis and Scientific Computing**.

2025 **Forbes Czech Republic, Top Women in Science 2025**.

2013 **Rising Stars in EECS**, *Selected Participant*, MIT, November 2013.

2010–2013 **National Defense Science and Engineering Graduate Fellowship**.

2009 **CRA Outstanding Undergraduate Research Award, Runner-up**.

2008 **Microsoft Technical Scholarship Award**.

2007 **Lockheed Martin Distinguished Scholar Award**.

2007 **Computing and Communications Scholarship for Undergraduate Women**, University of Virginia.

Professional Activities

Professional Leadership

2026–2028 **Vice Chair**, *SIAM Activity Group on Supercomputing (SIAG/SC).*

2024–2026 **Secretary**, *SIAM Activity Group on Supercomputing (SIAG/SC).*

2022–2028 **Co-chair**, *GAMM Activity Group on Applied and Numerical Linear Algebra.*

Editorial and Evaluation

2026 **Proceedings Chair**, *ISC High Performance, Hamburg, Germany, June 22-26, 2026.*

2026 **Proceedings Chair**, *SIAM Conference on Parallel Processing for Scientific Computing, Berlin, Germany, March 3-6, 2026.*

2025 **Proceedings Deputy Chair**, *ISC High Performance, Hamburg, Germany, June 10-13, 2025.*

2026– **Associate Editor**, *SIAM Journal on Scientific Computing.*

2025– **Associate Editor**, *IMA Journal of Numerical Analysis.*

2025– **Associate Editor**, *ACM Transactions on Mathematical Software (TOMS).*

2025– **Associate Editor**, *SIAM Journal on Matrix Analysis and Applications.*

2022– **Associate Editor**, *ACM Transactions on Parallel Computing (TOPC).*

2027 **SIAM Ivo and Renata Babuška Prize Selection Committee**.

2026– **Scientific Board Member**, *Institute of Mathematics, Czech Academy of Sciences.*

2026– **Scientific Board Member**, *Faculty of Science, Masaryk University.*

2025– **Evaluation Panel Member**, *Grantová agentura České republiky.*

2026 **Evaluator**, *Swiss National Science Foundation, Croatian National Science Foundation, EuroHPC, MSCA.*

2023– **Access Resource Committee Member**, *The European High-Performance Computing Joint Undertaking (EuroHPC).*

2021–2023 **Access Committee Member**, *Partnership for Advanced Computing in Europe (PRACE).*

Conference Organizing Committees

2026 **Organizer** (with U. Rüde, L. Stahls, and J. Dongarra), *Dagstuhl Seminar: "Reduced and Mixed Precision Computing for Science and Engineering Applications", Schloss Dagstuhl, DE, February 15-20, 2026.*

2026 **Organizing Committee Member**, *SIAM Conference on Parallel Processing for Scientific Computing (PP26), Berlin, Germany, March 2-6, 2026.*

2024 **Organizing Committee Member**, *SIAM Conference on Applied Linear Algebra (LA24), Paris, France, May 13-17, 2024.*

2023 **Organizer** (with D. Kressner, J. Liesen, R. Peng, and N. Srivastava), *BIRS Workshop: "Perspectives on Matrix Computations: Theoretical Computer Science Meets Numerical Analysis", Banff International Research Station, Banff, CA, March 5-10, 2023.*

2023 **Organizing Committee Member**, *SIAM Conference on Computational Science and Engineering (CSE23), February 26 - March 3, 2023.*

2022 **Organizing Committee Member**, *GAMM Workshop on Applied and Numerical Linear Algebra (GAMM ANLA '22), Prague, Czech Republic, September 22-23, 2022.*

Conference Program Committees

2027 **Technical Papers Track Co-Chair**, *International Conference on Parallel Processing (ICPP '27), Sapporo, Japan, September 13 - 17, 2027*, Track: "Algorithms".

2027 **Program Committee Member**, *Platform for Advanced Scientific Computing (PASC '27), Lugano, Switzerland, June 28 - 30, 2027*, Track: "Computational Methods and Applied Mathematics".

2027 **Program Committee Member**, *IEEE International Conference for High Performance Computing, Networking, Storage and Analysis (Supercomputing '27), Denver, USA, November 14-19, 2027*, Tracks: "Algorithms".

2026 **Program Committee Member**, *IEEE International Conference for High Performance Computing, Networking, Storage and Analysis (Supercomputing '26), Atlanta, USA, November 17-20, 2026*, Tracks: "Algorithms", "Research Posters".

2026 **Program Committee Member**, *International Conference on Parallel Processing (ICPP '26), Singapore, September 28 - October 1, 2026*, Track: "Algorithms".

2026 **Program Committee Member**, *Platform for Advanced Scientific Computing (PASC '26), Bern, Switzerland, June 29 - July 1, 2026*, Track: "Computational Methods and Applied Mathematics".

2026 **Program Committee Member**, *IEEE International Parallel and Distributed Processing Symposium (IPDPS '26), May 25-29, 2026*, Track: "Algorithms".

2025 **Program Committee Member**, *IEEE International Conference for High Performance Computing, Networking, Storage and Analysis (Supercomputing '25), St. Louis, USA, November 16-21, 2025*, Track: "Technical Papers - Algorithms".

2025 **Program Committee Member**, *International Conference on Parallel Processing (ICPP '25), San Diego, USA, September 8-11, 2025*, Track: "Algorithms".

2025 **Program Committee Member**, *Platform for Advanced Scientific Computing (PASC '25), Zurich, Switzerland, June 16-18, 2025*, Track: "Computational Methods and Applied Mathematics".

2025 **Program Committee Member**, *IEEE International Parallel and Distributed Processing Symposium (IPDPS '25), June 3-7, 2025*, Track: "Algorithms".

2024 **Vice Chair**, *IEEE International Conference for High Performance Computing, Networking, Storage and Analysis (Supercomputing '24), Atlanta, USA, November 18-22, 2024*, Track: "Technical Papers - Algorithms".

2024 **Program Committee Member**, *Euro-Par 2024, Madrid, Spain, August 26-30, 2024*, Track: "Theory and Algorithms".

2024 **Program Committee Member**, *ACM Symposium on Parallelism in Algorithms and Architectures (SPAA '24), Nantes, France, June 17-21, 2024.*

2024 **Program Committee Member**, *International Conference on High Performance Computing in Asia Pacific Region (HPCAsia2024), Nagoya, Japan, January 25-27, 2024*, Track: "Applications and Algorithms".

2023 **Program Committee Member**, *IEEE International Conference for High Performance Computing, Networking, Storage and Analysis (Supercomputing '23), Denver, USA, November 12-17, 2023*, Track: "Technical Papers - Algorithms".

2023 **Program Committee Member**, *International Conference on Parallel Processing (ICPP '23), Salt Lake City, USA, August 7-10, 2023*, Track: "Algorithms".

2023 **Program Committee Member**, *ACM Symposium on Parallelism in Algorithms and Architectures (SPAA '23), Orlando, USA, June 16-19, 2023.*

2022 **Program Committee Member**, *IEEE International Conference for High Performance Computing, Networking, Storage and Analysis (Supercomputing '22), St. Louis, USA, November 13-18, 2022*, Track: "Technical Papers - Algorithms".

2022 **Program Committee Member**, *IEEE International Conference on Cluster Computing (Cluster '22), Heidelberg, DE, September 6-9, 2022*, Track: "Algorithms and Applications".

2022 **Program Committee Member**, *International Conference on Parallel Processing (ICPP '22), Bordeaux, FR, August 29-September 1, 2022*, Track: "Multidisciplinary".

2022 **Program Committee Member**, *IEEE International Parallel and Distributed Processing Symposium (IPDPS '22), May 30 - June 3, 2022*, Track: "Algorithms".

2022 **Program Committee Member**, *Principles and Practice of Parallel Programming (PPoPP '22), February 16-22, 2022.*

2021 **Program Committee Member**, *IEEE International Conference for High Performance Computing, Networking, Storage and Analysis (Supercomputing '21), St. Louis, USA, November 14-19, 2021*, Track: "Technical Papers - Algorithms".

2021 **Program Committee Member**, *IEEE International Symposium on Computer Architecture and High Performance Computing (SBAC-PAD '21), Belo Horizonte, Brazil, October 26-29, 2021*, Track: "Parallel Applications and Algorithms".

2021 **Program Committee Member**, *Platform for Advanced Scientific Computing (PASC '21), online, July 5-9, 2021*, Track: "Computer Science and Applied Mathematics".

2021 **Program Committee Member**, *IEEE International Parallel and Distributed Processing Symposium (IPDPS '21), online, May 17-21, 2021*, Track: "Algorithms".

2021 **Program Committee Member**, *Principles and Practice of Parallel Programming (PPoPP '21), online, February 27 - March 3, 2021.*

2020 **Program Committee Local Chair**, *Euro-Par 2020, online, August 24-28, 2020*, Track: "Parallel Numerical Methods and Applications".

2019 **Primary Program Committee Member**, *IEEE International Parallel & Distributed Processing Symposium (IPDPS '19), Rio de Janeiro, Brazil, May 20-24, 2019*, Track: "Algorithms".

2018 **Program Committee Member**, *IEEE International Conference for High Performance Computing, Networking, Storage and Analysis (Supercomputing '18), Dallas, USA, November 11-16, 2018*, Tracks: "Technical Papers - Algorithms" and "Doctoral Showcase".

2018 **Program Committee Member**, *SIAM Workshop on Combinatorial Scientific Computing (CSC18), Bergen, Norway, June 6-8, 2018.*

2016 **Program Committee Member**, *Technical Papers - Algorithms Track, IEEE International Conference for High Performance Computing, Networking, Storage and Analysis (Supercomputing '16), Salt Lake City, USA, November 13-18, 2016.*

Minisymposia, Workshop, and Seminar Organization

2027 **Workshop Organizer**, *"Mixed and Adaptive Precision Numerics for Scientific Computing (MxP4S)", co-located with IPDPS '27, Seattle, USA, June 1-5, 2027.*

2026 **Minisymposium Organizer**, *"Numerical Algorithms for PDE Solvers on Modern HPC Architectures", Equadiff 2026, Prague, Czech Republic, June 29 - July 3, 2026.*

2025 **Minisymposium Co-organizer** (with M. Croci), *"Reduced- and Mixed-Precision Algorithms and Theory for Scientific Computing", ENUMATH 2025, Heidelberg, Germany, September 1-5, 2025.*

2023 **Minisymposium Co-organizer** (with E. Oktay and T. Mary), *"Mixed precision computations in theory and practice", ENUMATH 2023, Lisbon, Portugal, September 4-8, 2023.*

2023 **Minisymposium Co-organizer** (with I. Daužickaitė), *"Saddle point problems: solvers and preconditioners", 29th Biennial Numerical Analysis Conference, Glasgow, Scotland, June 27 - 30, 2023.*

2023 **Minisymposium Co-organizer** (with N.J. Higham and T. Mary), *"Mixed Precision Algorithms in Numerical Linear Algebra", SIAM Conference on Computational Science and Engineering (CSE23), February 26 - March 3, 2023.*

2022 **Young Researchers' Minisymposium Co-organizer** (with J. Blechta), *"The Push to Exascale: High Performance Numerical Linear Algebra on Modern Hardware", 92nd Annual Meeting of the International Association of Applied Mathematics and Mechanics (GAMM '22), Aachen, Germany, August 15-19, 2022.*

2022 **Minisymposium Co-organizer** (with K. Soodhalter and P. Vacek), *"Reusing Information in Iterative Methods", 27th International Conference on Domain Decomposition Methods (DD '22), Prague, Czech Republic, July 25-29, 2022.*

2022 **Focus Session Co-organizer** (with I. Daužickaitė), *"Mixed Precision in Low-Rank Approximation and Randomization", ISC High Performance 2022, Hamburg, Germany, May 29 - June 2, 2022.*

2022 **Scientific Committee Member**, *E-NLA Seminar.*

2021 **Minisymposium Co-organizer** (with H. Anzt and U. Meier Yang), *"Multiprecision Numerics in Scientific High Performance Computing", Platform for Advanced Scientific Computing (PASC '21), online, July 5-9, 2021.*

2021 **Minisymposium Co-organizer** (with K. Lund and K. Soodhalter), *"Block Krylov Subspace Methods for Scientific Computing", SIAM Conference on Applied Linear Algebra (LA21), online, May 17-21, 2021.*

2019 **Minisymposium Co-organizer** (with J. Šístek and P. Arbenz), *"Numerical Methods for Massively Parallel Computations", Modelling 2019, Olomouc, Czech Republic, September 16-20, 2019.*

2019 **Minisymposium Co-organizer** (with A. Greenbaum), *"Roundoff Error in High-Performance Implementations of CG/Lanczos-type Solvers", SIAM Conference on Computational Science and Engineering (CSE19), Spokane, Washington, February 25 - March 1, 2019.*

2018 **Minisymposium Co-organizer** (with S. Cools), *"Scalable Communication-Avoiding and -Hiding Krylov Subspace Methods", SIAM Conference on Parallel Processing for Scientific Computing (PP18), Tokyo, Japan, March 7-10, 2018.*

2017 **Minisymposium Organizer**, *MS76/93: "Communication-Avoiding Algorithms", SIAM Annual Meeting (AN17), Pittsburgh, USA, July 10-14, 2017.*

2016 **Minisymposium Co-organizer** (with L. Grigori), *"Minimizing Communication in Numerical Algorithms", SIAM Conference on Parallel Processing for Scientific Computing (PP16), Paris, France, April 12-15, 2016.*

2015 **Minisymposium Organizer**, *"Approaches to Reducing Communication in Krylov Subspace Methods", SIAM Conference on Applied Linear Algebra (LA15), Atlanta, Georgia, October 26-30, 2015.*

Supervised Theses

Current Supervised Theses

Bachelors's Jakub Baran (since 2025), Anna Lörincová (since 2026)

Master's Lukáš Veškrna (since 2026), Lukáš Chrást (since 2026)

PhD Ioannis Thanasis (since 2024), Thomas Bake Arenas (since 2024)

Previous Supervised Theses

Bachelor's Jakub Hercík (graduated 2022), Lukáš Chrást (graduated 2025), Stanislav Müller (graduated 2026), Pavel Kletečka (graduated 2026), Jindřich Pohl (graduated 2026)

Master's Josef Martínek (graduated 2023; awarded the Ivo Marek Prize), Jakub Hercík (graduated 2024), Tomáš Ondo (graduated 2026)

PhD Eda Oktay (graduated 2024; awarded Babuška Prize, second place), Petr Vacek (graduated 2024)

Teaching Experience

2020 **NMNV468: Numerical Linear Algebra for Data Science and Informatics**, Instructor, Charles University, Summer 19/20, Summer 21/22, Summer 22/23, Summer 23/24, Summer 24/25, Summer 25/26.

2019 **NMNV565: High Performance Computing for Computational Science**, Instructor, Charles University, Winter 19/20, Winter 20/21, Winter 22/23, Winter 23/24, Winter 24/25, Winter 25/26, Winter 26/27.

2017 **MATH-UA 140: Linear Algebra**, Instructor, New York University, Fall 2017.

2016–2018 **DS-GA 1004: Big Data**, Instructor, New York University, Spring 2016, Spring 2017, Spring 2018.

2015–2016 **MATH-UA 120: Discrete Mathematics**, Instructor, New York University, Fall 2015, Fall 2016.