Cynthia A. Phillips

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Education

Ph.D. in Computer Science 1990
  Massachusetts Institute of Technology, Cambridge, Massachusetts
  Dissertation: *Theoretical and Experimental Analyses of Parallel Combinatorial Algorithms*
  Advisor: Charles Leiserson
  Minor: imaging technology
M.S. Electrical Engineering and Computer Science 1985
  Massachusetts Institute of Technology, Cambridge, Massachusetts
  Dissertation: *Space-efficient algorithms for computational geometry.*
  Advisor: Charles Leiserson
B.A. Applied Mathematics with application to computer science, 1983
  Harvard University, Cambridge, MA

Research Areas - past and present

General areas: Combinatorial optimization, algorithm design and analysis, parallel computation, scheduling, network and infrastructure surety, integer programming, graph algorithms, complex and social network analysis, cyber security, streaming, neuromorphic computing, algorithm/architecture co-design
new areas: quantum information science
Past areas: vehicle routing, computational biology, experimental algorithmics, wireless networks, sensor placement

Honors and Awards

2016	SIAM Fellow
2015	ACM Distinguished Scientist
2015	Best (Algorithms) Paper Award,
	International Parallel and Distributed Processing Symposium (IPDPS)
2015	Sandia National Laboratories Employee Recognition Award,
	Individual Exceptional Service
2010	IEEE Meritorious Service Award
2010	Award for Excellence in Technology Transfer
	given by Federal Laboratory Consortium for Technology Transfer (FLC)
	Red Storm Massively Parallel Processor Supercomputer Architecture team
2008	Franz Edelman Award finalist, team member "Reducing Security Risks in

American Drinking Water Systems"

2006	R&D 100 Award (team member), Compute Process Allocator
2006	(US Representative) Heather Wilson recognition as
	"Builder of Dreams and Community" for mathematical education outreach
2000	Sandia National Laboratories Employee Recognition Award,
	Individual Technical Excellence
2000	YWCA (Central Rio Grande) Woman on the Move in Science and Technology
1987-1989	IBM Graduate Fellowship
1982	Phi Beta Kappa

Patents

2019   Patent 10,445,065, Constant depth, near constant depth, and subcubic size threshold circuits for linear algebraic calculations (with J.B. Aimone and O. Parekh)

2009   Patent 7,565,657, Allocating Application to Group of Consecutive Processors in Fault-Tolerant Deadlock-Free Routing Path Defined By Routers Obeying Same Rules for Path Selection (with Leung, Bender, Bunde)

2006   Patent 7,013,395, Method and Tool for Network Vulnerability Analysis (with L. Swiler)

Professional Experience

Sandia National Laboratories, NM, Laboratory Fellow (1/2023-present)
Sandia National Laboratories, NM, Senior Scientist (3/2010 - 1/2023)
Sandia National Laboratories, NM, Distinguished Member of Technical Staff, (10/2000-3/2010)
Sandia National Laboratories, NM, Principal Member of Technical Staff, (1/98 - 10/2000)
Sandia National Laboratories, NM, Senior Member of Technical Staff, (1/90 - 1/98)
Research projects: Historically, researchers at Sandia must work on a diverse set of application areas while doing research. Past or present Research projects (non-exhaustive) include: design and analysis of algorithms for network reliability, combinatorial scheduling, sensor placement in networks (for the EPA; used by many large US cities), computational biology, social network analysis, analysis of images from overhead sensors, computational geometry motivated by trajectory analysis, co-design for extreme-scale computing, distributed graph algorithms, network design, scheduling, general cybersecurity, high-performance data structures for big data applications, multi-level-memory algorithms. One of the leaders of the PICO (Parallel Integer and Combinatorial Optimization) project, the first massively parallel, general mixed-integer programming code, which is now largely dormant. One of the technical leads on a computer-network vulnerability analysis tool (vulnerability to electronic/hacker attack), worked with a team to create a prototype parallel solver for mixed-integer PDE-constrained optimization.

Thinking Machines Corporation, Cambridge, MA, Consultant, (5/87-6/89)
Project: Development and implementation on the Connection Machine of algorithms for combinatorial optimization including the simplex algorithm for linear programming , network flow, assignment problem, and traveling salesman.

Massachusetts Institute of Technology, Cambridge, MA, (9/83 - 10/89)
Project: Research Assistant in VLSI algorithms, parallel algorithms. Teaching assistant for introductory programming course (Fall 1983) and introductory algorithms course (Fall 1985).

Bolt, Beranek, and Newman, Inc., Cambridge, MA, (Summers 1983, 1984)
Projects: Designed and implemented database for a network monitor/automated network manager for packet radio networks and the arpanet.

General Computer Company, Cambridge, MA, (Summer 1982)
Project: Designed and implemented video games.

Harvard University, Cambridge, MA, (9/80-6/83, except spring 1981).
Project: Undergraduate Teaching Fellow for course designed to meet undergraduate core requirement in quantitative reasoning. Sole lecturer for 8–28 students. Designed and graded homework and exams. Head teaching fellow 1982–1983.

Other Professional Experience

University of New Mexico, Research Associate Professor of Electrical & Computer Engineering, (10/2002-2010). Research Professor of Computer Science, 2014-2018.

VLSI Design

Designed VLSI chip to perform pseudorandom permutation of bit-serial messages, 1985. Manufactured through MOSIS. Unpublished manuscript "A pseudorandom permuter for bit-serial messages."

Service to the CS/math/OR Community, ordered by first service if multiple years

Professional Society Leadership

ACM Symposium on Parallelism in Algorithms and Architectures (SPAA), conference secretary 1999-2004, local arrangements chair (joint with PODC) 2005

SIAM Special Interest Group on Supercomputing (SIAM SIAG/SC) program director 2008-9, chair 2010-11.

Member oversight board, SIAM Mathematics in Industry study 2008-2011.

SIAM committee on programs and conferences 2010-2015.

SIAM Nominating commitee 2011-12.

INFORMS Computing Society Board, 2011-13

SIAM Vice President for Programs, 2014-2019.

IEEE Technical Committee on Parallel Processing (TCPP) advisory committee, 2015-present.

Founding (appointed) officer (secretary) for SIAM SIAG (Special Interest Group) on ACDA (Applied and Computational Discrete Algorithms), 2019-2020

Chair, best paper committee for IPDPS (International Parallel and Distributed Processing Symposium) 2019, 2020

Best paper committee, SPAA (Symposium on Parallelism in Algorithms and Architecture), 2020

IPDPS (International Parallel and Distributed Processing Symposium) task force, Small group to make recommendations on future conference changes, October, 2020 – December, 2021.

Chair of the selection committee for the George Polya Prize in Applied Combinatorics (SIAM prize), 2021

SIAM ethics committee, member 2019-20, chair 2021-2023

Elected chair of SIAM SIAG (Special Interest Group) on ACDA (Applied and Combinatorial Discrete Algorithms), 2021-22

Professional Conference Leadership

Europar, Chair of Program Committee, Workshop on Parallel and Distributed Computing, 1997

DIALM-POMC (Foundations of Mobile Computing) conference co-chair 2004.

IEEE International Parallel and Distributed Processing Symposium, program committee, Algorithms co-chair 2008, program committee chair 2010

ACM Symposium on Parallelism in Algorithms and Architectures (SPAA), program committee chair 2010.

SIAM Conference on Parallel Processing for Scientific Computing co-chair, 2010.

INFORMS Computing Society 2011 conference, organizing committee

Institute for Pure and Applied Mathematics (IPAM) program on Navigating Chemical Compound Space for Materials and Bio Design, workshop II: Optimization , search, and graph-theoretical algorithms for chemical compound space, organizing committee (and scheduled tutorial speaker), 2011

INFORMS Computing Society 2013 conference, organizing committee (sensors track chair)

International Workshop on Network Science for Communication Networks, co-chair 2013, general chair 2014, steering committee 2015

23rd annual IEEE International Conference on High Performance Computing, Data and Analytics (HiPC), algorithms co-vice chair, 2016

EduHPC - Workshop on Education for High Performance Computing (SuperComputing 2017 workshop), program chair, 2017, organizer 2018

Steering commmittee, IPDPS ((International Parallel and Distributed Processing Symposium), 2019-present.

Organizing Committee, SIAM ACDA (SIAM Conference on Applied and Computational Discrete Algorithms), 2021

Organizing Committee, SIAM Discrete Mathematics Conference, 2022

SIAM Symposium on Algorithm Engineering and Experiments (ALENEX), program committee co-chair 2022, steering committee 2022-present.

SuperComputing research posters chair, 2022.

Organizing Committee and program committee, SIAM Applied and Computational Discrete Algorithms Conference, 2023

Symposium on Experimental Algorithms (SEA) steering committee, 2022-2025

ISC HPC Algorithms and Applications track chair, 2023

Organizing Committee, SIAM Conference on Computational Science and Engineering, 2025.

Advisory Boards, Funding panels, etc

NSF panels in operations research and computer science

DOE ASCR (Advanced Scientific Computing Research) proposal panel

NSF/TCPP early adoptors proposal evaluating team, 2014

Institute for Computational and Experimental Research in Mathematics (ICERM), Scientific Advisory Board, term 2013-2015.

Institute for Mathematics and its Applications, Board of Governors, 2018-2022

Member of academic review committee, School of Industrial and Systems Engineering, Georgia Institute of Technology, 2018

Computing Research Association Committee on Widening Participation in Computing Research (CRA-WP) board October 2022 - October 2025.

Technical/Program Committees (regular member)

IEEE Symposium on Parallel and Distributed Processing, Program Committee 1993

ACM/SIAM Symposium on Discrete Algorithms, Program Committee 1999, 2014

International Computing and Combinatorics Conference, Program Committee 2003.

Scandianavian Workshop on Algorithm Theory, program committee (SWAT), 2004.

Heterogeneous Computing Workshop (HCW), program committee, 2005, 2006

IEEE International Conference on High Performance Computing, program committee, 2005

Grid and Pervasive Computing Conference, program committee, 2006, 2007, 2008

Workshop on Algorithm Engineering and Experiments (ALENEX), program committee 2007, 2020

International Workshop on Discrete Algorithms and Methods for Mobile Computing and Communications (DIALM), Program Committee, 2000, 2001, 2002. DIALM-POMC (Foundations of Mobile Computing) 2003, 2005,2007, 2008

Models and Algorithms for Planning and Scheduling Problems, PC 2009.

IEEE International Parallel and Distributed Processing Symposium (IPDPS), program committee, 2006, 2007, 2009, 2011, 2012, 2013, 2014, 2015, 2016, 2017, 2018, 2019, 2020, 2022, 2023

ACM Symposium on Parallelism in Algorithms and Architectures (SPAA), Program Committee 1994, 2000, 2003, 2005, 2009, 2013, 2016, 2017, 2020

International Workshop on Network Science for Communication Networks, program committee 2011, 2012, co-chair 2013, general chair 2014, steering committee 2015

International Conference on Distributed Computing Systems, program committee, 2011

ICORES (International Conference on Operations Research and Enterprise Systems), 2011, 2012, 2013, 2014, 2015 program committee

Workshop on Parallel Computing and Optimization (PCO) [became Parallel and Distributed Combinatorics and Optimization], program committee, 2011, 2012, 2014, 2015, 2016, 2017, 2018

IEEE International Conference on Computational Science and Engineering, program committee, 2012, 2013

NSF/TCPP Workshop on Parallel and Distributed Computing Education (EduPar), program committee 2013, 2014, 2015, 2016, 2017, 2018, 2019

Workshop on Education for High-Performance Computing (EduHPC) program committee 2014, 2016, 2018, 2019

Supercomputing (SC), algorithms program committee, 2014, 2015, 2017, 2018; research poster committee (and best-poster subcommittee), 2021

SIAM workshop on Network Science, program committee 2015, 2016

23rd Annual European Symposium on Algorithms (ESA 2015), program commitee, Engineering and Applications Track, and ESA Track B 2021.

European Workshop on Parallel and Distributed Computing Education for Undergraduate Students (Euro-EDUPAR), program committee, 2015

IEEE International Conference on High Performance Computing (HiPC), program committee, 2015, 2022

Principles and Practice of Parallel Programming (PPoPP), program committee, 2016

IEEE International Parallel and Distributed Processing Symposium Workshops Committee 2017, 2018, 2019, 2020

SIAM Workshop on Combinatorial Scientific Computing (CSC), program committee 2018, 2020

Supercomputing research posters committee, 2019, 2021

Workshop on Irregular Applications: Architectures and Algorithms (IA^3), program committee, 2019

EduHiPC 2019 (2nd Workshop on Education for High Performance Computing), 2019

ICCCN2020 (The 29th International Conference on Computer Communications and Networks) track CAAME (Communication Networks Architecture, Algorithms, Measurement, and Performance Evaluation)

Symposium on Algorithmic Principles of Computer Systems (APoCS), program committee, 2020, 2021

TheWebConference, senior PC member, 2022.

ICIAM (International Congress on Industrial and Applied Mathematics) scientific program committee, 2023.

Workshop on Graphs, Architectures, Programming, and Learning (GrAPL) [Part of IPDPS] program committee, 2023.

Other service

Core revision team, Curriculum Guideline for Parallel and Distributed Computing (PDC) in Undergraduate Education, NSF/IEEE-TCPP, 2017—2018.

co-editor, special issue of Algorithmica on algorithms for mobile computing and communication.

INFORMS Computing Society, student prize committee, 2012, 2013

co-editor, special issue "Keeping up with Technology: Teaching Parallel, Distributed and High-Performance Computing", Journal of Parallel and Distributed Computing, 2020-2021.

Session organizer for many INFORMS and SIAM conferences

Math/Science Education Outreach

Science advisor to the Zia elementary school (Zia Pueblo), 1990-91, coached team in NM high school supercomputer challenge 1991-92, Adventures in Supercomputing mentor 1993-4, Adventures in Supercomputing Judge 1994-8, coordinator/main author of Go Figure Mathematics Competition 1998-2005, lecturer at *Dream Catcher* summer program 1999, Number Forest (math) exhibit planning for Explora museum. Member, Board of Trustees, Manzano Day School, Albuquerque, NM, 2010-2019 and 2020-present.

Publications

As of August 9, 2023, Google Scholar h-index = 38, citations = 8175

Journal/Book Publications

R. Carr, A. Haddadan, and C. A. Phillips, "Fractional decomposition tree algorithm: a tool for studying the integrality gap of integer programs," *Discrete Optimization*, Vol. 47, February, 2023.

J. Wendt, R. V. Field, C. A. Phillips, A. Prasadan, T. Wilson, S. Soundarajan, and S. Bhowmick, "Partitioning communication streams into graph snapshots," *IEEE Transactions on Network Science and Engineering*, doi=10.1109/TNSE.2022.3223614, December, 2022.

J. Vorobyeva, D. R. Delayo, M. A. Bender, M. Farach-Colton, P. Pandey, C. A. Phillips, S. Singh, E. D. Thomas, T. M. Kroeger, "Using advanced data structures to enable responsive security monitoring," *Cluster Computing*, https://doi.org/10.1007/s10586-021-03463-5, Jan. 2022.

S. Singh, P. Pandey, M. A. Bender, J. W. Berry, M. Farach-Colton, R. Johnson, T. M. Kroeger and C. A. Phillips, "Timely Reporting of Heavy Hitters using External Memory," *ACM Transactions on Database Systems*, Vol. 46, No. 4, pp. 1-35, December, 2021.

J-P. Watson, W. E. Hart, H. Greenberg, and C. A. Phillips, "An analysis of multiple contaminant warning system design objectives for sensor placement optimization in water distribution networks," in *Harvey J. Greenberg A Legacy Bridging Operations Research and Computing*, January 2021.

J. Berry, C. A. Phillips, and J. Saia, "Making Social Networks More Human: a Topological Approach," *Statistical Analysis and Data Mining The ASA Data Science Journal*, Vol. 12, No. 6, pp. 449-464, December, 2019.

P. Gjanci, C. Petrioli, S. Basagni, C. A. Phillips, L. Bölöni, and D. Turgut, "Path Finding for Maximum Value of Information in Multi-modal Underwater Wireless Sensor Networks," *IEEE Transactions on Mobile Computing*, Vol. 17, No. 2, pp. 404-418, February, 2018.

S. Fekete, K. Huang, J. S. B. Mitchell, O. Parekh, and C.A. Phillips, "Geometric Hitting Set for Segments of Few Orientations," *Theory of Computing Systems*, Vol. 62, pp. 268-303, Feb 2018 (special issue with best papers from Workshop on Approximation and Online Algorithms (WAOA), 2015., preliminary version in WAOA.)

M. A. Bender, J. W. Berry, S. D. Hammond, K. S. Hemmert, S. McCauley, B. Moore, B. Moseley, C. A. Phillips, D. Resnick and Arun Rodrigues, "Two-level main memory co-design: Multi-threaded algorithmic primitives, analysis, and simulation,"*Journal of Parallel and Distributed Computing*, Vol. 102, pp. 213-228, 2017.

R. Brost, C. Phillips, D.G. Robinson, D. J. Stracuzzi, A. G. Wilson, D. M-K. Woodbridge, "Computing quality scores and uncertainty for approximate pattern matching in geospatial semantic graphs," *Statistical Analysis and Data Mining*, Vol. 8, Issue 5-6, pp. 340-352, October/December 2015.

J. Eckstein, W. E. Hart, C. A. Phillips, "PEBBL: an object-oriented framework for scalable parallel branch and bound," *Mathematical Programming Computation*, Vol. 7, No. 4, pp. 429–469, December, 2015.

J. W. Berry, L. K. Fostvedt, D. J. Nordman, C. A. Phillips, C. Seshadhri, A. G. Wilson, "Why do simple algorithms for triangle enumeration work in the real world?" *Internet Mathematics*, Vol. 11, No. 6, pp. 555-571,May 2015, preliminary version appeared in *Proceedings of the 5th Innovations in Theoretical Computer Science Conference*, January 2014.

M. Davis, R. Janke, and C. A. Phillips, "Robustness of Designs for Drinking-Water Contamination Warning Systems under Uncertain Conditions." *Journal of Water Resources Planning and Management*, Volume 140, No. 10, October 2014.

T. La Porta, C. Petrioli, C. A. Phillips, and D. Spenza, "Sensor mission assignment in rechargeable wireless sensor networks," *ACM Transactions on Wireless Sensor Networks*, Volume 10, No. 4, June 2014.

K. Klise, C. A. Phillips, and R. Janke "Two-Tiered Sensor Placement for Large Water Distribution Network Models," *Journal of Infrastructure Systems*, Vol. 19, No. 4, pp. 465–473, 2013.

R. Murray, T. Haxton, W. E. Hart, and C. A. Phillips, "Real-world case studies for sensor network design of drinking water contamination warning systems," *Handbook of Water and Wastewater Systems Protection*, editors: R. M. Clark, S. Hakim, and A. Ostfeld, Series: Protecting Critical Infrastructure, Springer, New York, 2011, pp. 319-348.

J. Levy, M. S. Carroll, A. Ganti, C. A. Phillips, A. J. Landahl, T. M. Gurrieri, R. D. Carr, H. L. Stalford, and E. Nielsen, "Implications of electronics constraints for solid-state quantum error correction and quantum circuit failure probability" *New Journal of Physics*, September 2011.

J. Berry, B. Hendrickson, R. LaViolette, and C. Phillips, "Tolerating the community detection resolution limit with edge weighting," Physical Review E, Vol. 83, No. 5, May 2011.

S. Basagni, A. Carosi, C. Petrioli, C. Phillips, "Coordinated and controlled mobility of multiple sinks for maximizing the lifetime of wireless sensor networks," *Wireless Networks*, Vol. 17, No. 3, April 2011, pp. 759–778. A preliminary version appeared in *Proceedings of the IEEE International Conference on Communications (ICC)*, Dresden, June 2009.

V. King, C. Phillips, J. Saia, M. Young, "Sleeping on the job: energy-efficient and robust broadcast for radio networks," *Algorithmica*, Vol. 61, No. 3, pp. 518–554, 2011. A preliminary version appeared in *Proceedings of 27th Annual ACM Symposium on Principles of Distributed Computing (PODC)*, pp. 243–252, 2008.

J. Berry, R. Carr, W. Hart, V. Leung, C. Phillips, J.-P. Watson, "Designing contamination warning systems for municipal water networks using imperfect sensors," *Journal of Water Resources Planning and Management*, Vol. 135, No. 4, pp. 253–263, July/August, 2009.

R. Murray, W. E. Hart, C. A. Phillips, J. Berry, E. Boman, R. D. Carr, L. A. Riesen, J.-P. Watson, T. Baranowski, G. Gray, J. Herrmann, R. Janke, T. N. Taxon, J. Uber, K. Morley, "U. S. Environmental Protection Agency uses Operations Research to Reduce Drinking Water Contamination Risks," Edelman finalist paper, *Interfaces*, Vol. 39, No. 1, pp. 57-68, January-February 2009.

M. Bender, D. Bunde, E. Demaine, S. Fekete, V. Leung, H. Meijer, and C. Phillips, "Communication-Aware processor allocation for supercomputers: finding point sets of small average distance," *Algorithmica*, Vol 50, No. 2, pp. 279–298, 2008. Preliminary version appeared in *Proceedings of Workshop on Algorithms and Data Structures (WADS)*, 2005.

Ostfeld et. al. (one of 34 authors), "The battle of the water sensor networks (BWSN): a design challenge for engineers and algorithms," *Journal of Water Resources Planning and Management*, Vol. 134, No. 6, November/December 2008, pp. 556–568.

S. Basagni, C. Phillips, "Editors foreward to the special issue on principles of mobile communications and computing," *Algorithmica*, Vol 49, No 4, December 2007, pp. 259-263.

J. Berry, W. Hart, C. Phillips, J. Uber, and J-P. Watson, "Sensor placement in municipal water networks with temporal integer programming models," *Journal of Water Resources Planning and Management*, Vol. 132, No. 4, pp. 218–24, July/August 2006.

R. Carr, H.J. Greenberg, W. E. Hart, G. Konjevod, E. Lauer, H. Lin, T. Morrison, C. Phillips, "Robust Optimization of Contaminant Sensor Placement for Community Water Systems," *Mathematical Programming B*, Vol. 107, No. 1, pp. 337-356, June, 2006.

J. Eckstein, W. Hart, and C. Phillips, "Massively-Parallel Mixed-integer programming: algorithms and applications," in *Parallel Processing for Scientific Computing*, M.A. Heroux, P. Raghavan, and H.D. Simon editors, SIAM, 2006.

J. Berry, L. Fleischer, W. Hart, C. Phillips, J-P. Watson, "Sensor Placement in Municipal Water Networks," *Journal of Water Resources Planning and Mangement*, Vol. 131, No. 3, May, 2005, pp. 237–243.

D. Bader, W. Hart, and C. Phillips, "Parallel algorithm design for branch and bound," in H. J. Greenberg (ed), *Tutorials on Emerging Methodologies and Applications in Operations Research*, Kluwer Academic Press, 2004.

Carl Burch, Robert Carr, Sven Krumke, Madhav Marathe, Cynthia Phillips, and Eric Sundberg, "A decomposition-based pseudoapproximation algorithm for network flow inhibition", in *Network Interdiction and Stochastic Integer Programming*, D.L. Woodruff (ed), Kluwer Academic Press, 2003, pp. 51-68.

Kwan Kwok, Brian Driessen, Cynthia Phillips, and Craig Tovey, "Analyzing the Multiple-Target-Multiple-Agent Scenario Using Optimal Assignment Algorithms," *Journal of Intelligent and Robotic Systems*, Vol. 35, No. 1, September 2002, pp. 111-122, preliminary version appeared in *SPIE Proceedings Volume 3209, Sensor Fusion and Decentralized Control in Autonomous Robotic Systems*, Pittsburgh, PA, October 14-15, 1997.

Cynthia Phillips, R.N. Uma, and Joel Wein, "Off-line Admission Control for General Scheduling Problems," Journal of Scheduling, Vol. 3, No. 6, 2000, pp. 365–382, preliminary version appeared in *Proceedings of the Eleventh Annual ACM/SIAM Symposium on Discrete Algorithms*, January 2000, pp. 879–888.

Cynthia Phillips, Clifford Stein, Eric Torng, and Joel Wein, "Optimal Time-Critical Scheduling via Resource Augmentation," *Algorithmica*, Vol. 32, pp. 163-200, 2002, preliminary version in *Proceedings of the 29th Annual ACM Symposium on Theory of Computing*, El Paso, TX, May 4-6, 1997, pp. 140-149.

Maria Bonet, Cynthia Phillips, Tandy Warnow, and Shibu Yooseph, "Constructing Evolutionary Trees in the Presence of Polymorphic Characters," *SIAM Journal on Computing*, Vol. 29, No. 1, pp. 103-131, 1999, Preliminary version appeared in *Proceedings of the 28th Annual ACM Symposium on Theory of Computing*, Philadelphia, PA, May 22-24, 1996, pp. 220-229.

Mary Cryan, Leslie A. Goldberg, and Cynthia A. Phillips, "Approximation algorithms for the fixed-topology phylogenetic number problem," *Algorithmica*, Vol. 25, 1999, pp. 311-329. Preliminary version in *Combinatorial Pattern Matching* 1997.

Cynthia Phillips, Clifford Stein, and Joel Wein, "Minimizing Average Completion Time in the Presence of Release Dates," *Mathematical Programming B*, Vol. 82, Nos. 1-2, June 1998, pp. 199-224, Preliminary version " Scheduling jobs that arrive over time," in *Proceedings of the Fourth International Workshop on Algorithms and Data Structures*, pages 86-97, 1995.

Soumen Chakrabarti, Cynthia Phillips, Andreas Schulz, David Shmoys, Clifford Stein, and Joel Wein, "Improved Bounds on Relaxations of a Parallel Machine Scheduling Problem," *Journal of Combinatorial Optimization*, Vol. 1, No. 4, 1998, pp. 413-426.

Leslie Ann Goldberg, Paul Goldberg, Cynthia A. Phillips, and Gregory Sorkin, "Constructing Computer Virus Phylogenies," *Journal of Algorithms*, Vol. 26, No. 1, 1998, 188-208. Preliminary version in *Combinatorial Pattern Matching*, 1996.

Cynthia Phillips, Clifford Stein, and Joel Wein, "Task Scheduling in Networks," *SIAM Journal on Discrete Mathematics* Vol. 10, No. 4, 11/97, pp. 573-598, preliminary version in Scandinavian Workshop on Algorithm Theory (SWAT), Lecture Notes in Computer Science, Vol. 824, pp. 290-301, 1994.

Leslie Ann Goldberg, Paul Goldberg, Cynthia A. Phillips, Elizabeth Sweedyk, and Tandy Warnow, "Minimizing phylogenetic number to find good evolutionary trees," *Discrete Applied Mathematics* Vol. 71 Nos. 1-3, 5 December 1996, pp. 111-136.

Cynthia A. Phillips and Tandy Warnow, "The Asymmetric Median Tree – A New Model for Building Consensus Trees," *Discrete Applied Mathematics*, Vol. 71 Nos. 1-3, 5 December 1996, pp. 311-336. Preliminary Version in Combinatorial Pattern Matching, 1996, pp. 234-252.

David S. Greenberg, William E. Hart and Cynthia A. Phillips, "Enabling Department-Scale Supercomputing," *Algorithms for Parallel Processing*, IMA Volumes in Mathematics and Its Applications, Vol 105, 1997, pp. 321-344.

Cynthia A. Phillips and Stavros A. Zenios, "Experience with Large-Scale Network Optimization," in *Impact of Recent Computer Advances on Operations Research*, Elsevier Science Publishing Co., 1989.

Refereed Conference Publications (14 papers are only listed above with their journal versions)

D. Delayo, K. Zhang, K. Agrawal, M. Bender, J. Berry, R. Das, B. Moseley, C. A. Phillips, "Automatic HBM management: models and Algorithms," ACM Symposium on Parallelism in Algorithms and Architectures (SPAA), 2022.

James B. Aimone, Yang Ho, Ojas Parekh, Cynthia A. Phillips, Ali Pinar, William Severa, Yipu Wang, "Provable advantages for graph algorithms in spiking neural networks," ACM Symposium on Parallelism in Algorithms and Architectures (SPAA), 2021.

R. Das, K. Agrawal, M. Bender, J.W. Berry, B. Moseley, C. A. Phillips, "How to manage high-bandwidth memory automatically," ACM Symposium on Parallelism in Algorithms and Architectures (SPAA), 2020.

S. Fekete, A. Hill, D. Krupke, T. Mayer, J. S. B. Mitchell, O. Parekh, C. A. Phillips, "Probing a set of trajectories to maximize captured information," 18th International Symposium on Experimental Algorithms (SEA), 2020

P. Pandey, S. Singh, M. A. Bender, J. W. Berry, M. Farach-Colton, R. Johnson, T. M. Kroeger and C. A. Phillips, "Timely Reporting of Heavy Hitters using External Memory," ACM SIGMOD International Conference on Management of Data, pp. 1431-1446, June, 2020.

J.B. Aimone, Y. Ho, O. D. Parekh, C. A. Phillips, A. Pinar, W. Severa, and Y. Wang, "Brief Announcement: Provable neuromorphic advantages for computing constrained shortest paths," 32nd ACM Symposium on Parallelism in Algorithms and Architectures (SPAA), 2020.

J. Crussell, T. M. Kroeger, D. Kavaler, A. Brown, and C. Phillips, "Lessons learned from 10k Experiments to Compare Virtual and Physical Testbeds," *Proceedings of the 12th USENIX Workshop on Cyber Security Experimentation and Test,*(part of USENIX Security), 2019.

G. Slota, J. Berry, S. Hammond, S. Olivier, C. A. Phillips, and S. Rajamanickam, "Scalable Generation of Graphs for Benchmarking HPC Community-Detection Algorithms," *Proceedings of The International Conference for High Performance Computing, Networking, Storage, and Analysis (SuperComputing)*, 2019.

J. B. Aimone, O. Parekh, C. A. Phillips, A. Pinar, W. Severa, and H. Xu, "Dynamic programming with spiking neural computing," *Proceedings of the International Conference on Neuromorphic Systems (ICONS)*, 2019.

J. Crussell, T. M. Kroeger, A. Brown, and C. Phillips, "Virtually the same: comparing physical and virtual testbeds, Symposium on Network Algorithms and Performance Evaluation" Symposium on Network Algorithms and Performance Evaluation (NAPE), International Conference on Computing, Networking and Communications (ICNC), 2019.

H. Link, S. N. Richter, V. J. Leung, R. C. Brost, C. A. Phillips, and A. Staid, "Statistical Models of Dengue Fever", *Proceedings of the 16th Australasian Data Mining Conference (AusDM)*, 2018.

O. Parekh, C. A. Phillips, C. D. James, and J. B. Aimone, "Constant-depth and subcubic-size threshold circuits for matrix multiplication," *Proceedings of the 30th ACM Symposium on Parallelism in Algorithms and Architectures (SPAA)*, July 2018.

M. A. Bender, M. Farach-Colton, R. Johnson, S. Mauras, T. Mayer, C. A. Phillips and H. Xu, "Write-Optimized Skip Lists," *Proceedings of the 36th ACM SIGMOD-SIGACT-SIGAI Symposium on Principles of Database Systems (PODS'17)*, pp. 69–78, 2017.

M. A. Bender, J. W. Berry, R. Johnson, T. M. Kroeger, S. McCauley, C. A. Phillips, B. Simon, S. Singh, and D. Zage, "Anti-Persistence on Persistent Storage: History-Independent Sparse Tables and Dictionaries," *Proceedings of the 35th ACM SIGMOD-SIGACT-SIGAI Symposium on Principles of Database Systems (PODS'16)*, pp. 289-302, 2016.

M. A. Bender, J. Berry, S. D. Hammond, B. Moore, B. Moseley, C. A. Phillips, "k-means clustering on two-level memory," MemSys 2015, the first International Symposium on memory systems (ACM proceedings)

(Best Algorithms Paper) M. Bender, J. Berry, S. Hammond, K.S. Hemmert, S. McCauley, B. Moore, B. Moseley, C. Phillips, D. Resnick, and A. Rodrigues, "Two-level main memory co-design: multi-threaded algorithmic primitives, analysis, and simulation," *Proceedings of the IEEE International Parallel and Distributed Processing Symposium*, May 2015.

J. Berry, M. Collins, Aaron Kearns, C. Phillips, J. Saia, R. Smith, "Cooperative computing for autonomous data centers," *Proceedings of the IEEE International Parallel and Distributed Processing Symposium*, May 2015.

S. Basagni, L. Bölöni, P. Gjanci, C. Petrioli, C. Phillips, and D. Turgut, "Maximizing the Value of Sensed Information in Underwater Wireless Sensor Networks via an Autonomous Underwater Vehicle," *The 33rd Annual IEEE International Conference on Computer Communications (INFOCOM'14)*, April-May, 2014.

J. Berry, M. Oster, C. A. Phillips, S. Plimpton and T. M. Shead, "Maintaining connected components for infinite graph streams," *Proceedings of the 2nd International Workshop on Big Data, Streams and Heterogeneous Source Mining: Algorithms, Systems, Programming Models and Applications (BigMine '13)*, August 2013.

M. Bender, D. P. Bunde, V. J. Leung, S. McCauley, and C. A. Phillips, "Efficient Scheduling to Minimize Calibrations," *Proceedings of the 25th ACM Symposium on Parallelism in Algorithms and Architectures (SPAA)*, pp. 280–287, July 2013. [A shorter version appeared in *the 11th Workshop on Models and Algorithms for Planning and Scheduling Problems (MAPSP)*, 2013.]

R. L-Y. Chen and C. A. Phillips, "k-Edge Failure Resilient Network Design," *Proceedings of the International Network Optimization Conference, Electronic Notes in Discrete Mathematics*, Vol. 41, No. 5, June 2013, pp. 375-382.

J. E. Levy, A. Ganti, C. A. Phillips, B. R. Hamlet, A. J. Landahl, T. M. Gurrieri, R. D. Carr, and M. S. Carroll "Brief Announcement: The Impact of Classical Electronics Constraints on a Solid-State Logical Qubit Memory," *Proceedings of the 21st ACM Symposium on Parallelism in Algorithms and Architectures (SPAA)*, pp. 166-168. August, 2009.

S. Basagni, A. Carosi, C. Petrioli, C. Phillips, "Moving multiple sinks through wireless networks for lifetime maximization," Short paper in *5th IEEE International Conference on Mobile Ad-hoc and Sensor Systems (MASS)*, pp. 523–526. Sept. 2008.

W. Hart, J. Berry, E. Boman, C. Phillips, L. A. Riesen, and J.-P. Watson, "Limited-memory techniques for sensor placement in water distribution networks," *Proceedings of the Learning and Intelligent Optimization conference*, Springer Volume 5313, 2008.

W. E. Hart, J. W. Berry, R. Heaphy, and C. A. Phillips, "EXACT: The EXperimental Algorithmics Computational Toolkit," *proceedings of the Experimental Computer Science Conference*, 2007.

M. Bender and C. Phillips, "Scheduling DAGs on asynchronous processors," *Proceedings of the 19th Annual Symposium on Parallelism in Algorithms and Architectures (SPAA)*, 2007, pp. 35–45.

E. Asgeirsson, J. Berry, C. Phillips, D. Phillips, C. Stein, J. Wein "Scheduling an Industrial Production Facility," *Proceedings of the 10th Conference on Integer Programming and Combinatorial Optimization*, Lecture Notes in Computer Science, 3064, Springer, June 2004, 116–131.

V. Leung, E.M. Arkin, M.A. Bender, D. Bunde, J. Johnston, A. Lal, J.S.B. Mitchell, C. Phillips, S. Seiden, "Processor Allocation on Cplant: Achieving General Processor Locality Using One-Dimensional Allocation Strategies," *4th IEEE International Conference on Cluster Computing*, September 2002, pp. 296–304.

Laura P. Swiler, Cynthia Phillips, David Ellis, and Stefan Chakerian "Computer-Attack Graph Generation Tool," *Proceedings of the DARPA Information Survivability Conference and Exposition II, DISCEX'01*, June 12-14, 2001, pp. 307–321.

Jonathan Eckstein, William Hart, and Cynthia Phillips, "PICO: An object-oriented framework for parallel branch and bound," in *Inherently Parallel Algorithms in Feasibility and Optimization and Their Applications*, D. Butnariu, Y. Censor, and S. Reich (editors), Elsevier Science Publishers, Amserdam, The Netherlands, 2001, pp. 219–265.

Robert Carr, Lisa Fleischer, Vitus Leung, and Cynthia Phillips, "Strengthening the Integrality Gaps for Capacitated Network Design and Covering Problems," *Proceedings of the Eleventh Annual ACM/SIAM Symposium on Discrete Algorithms*, January 2000, pp. 106–115.

Cynthia A. Phillips and Laura P. Swiler, "A graph-based system for network-vulnerability analysis," *Proceedings of the New Security Paradigms Workshop*, 1998.

David B. Wilson, David Greenberg, and Cynthia Phillips, "Beyond Islands: Runs in Clone-Probe Matrices," *Proceedings of the First International Conference on Molecular Biology (RECOMB)*, Santa Fe, NM, Jan. 20-23, 1997, pp. 320-329.

Jonathan Eckstein, William E. Hart and Cindy Phillips, "Resource Management in a Parallel Mixed Integer Programming Package," *Proceedings Intel Supercomputer Users Group 13th Annual Conference*, Albuquerque, NM. June 11-13, 1997.

Soumen Chakrabarti, Cynthia A. Phillips, Andreas S. Schulz, David B. Shmoys, Clifford Stein, and Joel Wein, "Improved Scheduling Algorithms for Minsum Criteria," *Proceedings of the 23rd ICALP*, July 1996.

Cynthia A. Phillips, "The Network Inhibition Problem," *Proceedings of the 25th Annual ACM Symposium on the Theory of Computing*, May 16-18, 1993, pp.776-785.

James K. Park and Cynthia A. Phillips, "Finding Minimum-Quotient Cuts in Planar Graphs," *Proceedings of the 25th Annual ACM Symposium on the Theory of Computing*, May 16-18, 1993, pp.766-775.

Cynthia A. Phillips, "Parallel graph contraction," *First ACM Symposium on Parallel Algorithms and Architectures (SPAA)*, Santa Fe, NM, June 18-21, 1989, pp.148-157.

Ajit Agrawal, Guy E. Blelloch, Robert L. Krawitz, and Cynthia A. Phillips, "Four Matrix-Vector Primitives," *Proceedings of the First ACM Symposium on Parallel Algorithms and Architectures (SPAA)*, Santa Fe, NM, June 18-21, 1989, pp.292-302.

Other Selective, but not Refereed Conference Publications

W. Hart, R. Murray, C. Phillips, "Minimize Impact or Maximize Benefit: the Role of Objective Function in Approximately Optimizing Sensor Placement for Municipal Water Distribution Networks," World Water and Environmental Resources Congress, 2011.

D. Hart, W. Hart, S. McKenna, R. Murray, C. Phillips, "Integrating event detection system operating characteristics into sensor placement optimization," *12th Water Distribution Systems Analysis Symposium*, September, 2010.

J. Berry, E. Boman, C. Phillips, L. A. Riesen, "Low-memory Lagrangian relaxation methods for sensor placement in municipal water networks," World Water and Environmental Resources Congress, 2008.

W.E. Hart, J.W. Berry, R. Murray, C. Phillips, L. A. Riesen, J.-P. Watson, "The TEVA-SPOT toolkit for drinking water contaminant warning system design," World Water and Environmental Resources Congress, 2008.

J. W. Berry, R.D. Carr, W.E. Hart, C.A. Phillips, "Scalable water network sensor placement via aggregation," World Water and Environmental Resources Congress, 2007.

Jon Berry, Erik Lauer, Henry Lin, Cynthia Phillips, "Scheduling manual sampling for contamination detection in municipal water networks," Symposium on Water Distribution Systems Analysis, 2006

Jon Berry, Robert Carr, William Hart, Vitus Leung, Cynthia Phillips, and Jean-Paul Watson, "On the placement of imperfect sensors in municipal water networks," Symposium on Water Distribution Systems Analysis, 2006

Jon Berry, William Hart, Cynthia Phillips, James Uber, Thomas Walski, "Water Quality Sensor Placement in Water Networks with Budget Constraints," World Water and Environmental Resources Congress 2005.

Jon Berry, William Hart, Cynthia Phillips, James Uber, Jean-Paul Watson, "Validation and Assessment of Integer Programming Sensor Placement Models," World Water and Environmental Resources Congress 2005.

Jon Berry, William Hart, Cynthia Phillips, Jean-Paul Watson, "Scalability of Integer Programming Computations for Sensor Placement in Water Networks," World Water and Environmental Resources Congress 2005.

Carr, R., Greenberg, H., Hart, W., and Phillips, C. (2004) Addressing Modeling Uncertainties in Sensor Placement for Community Water Systems. Critical Transitions in Water and Environmental Resources Management: pp. 1-10.

Significant Other Publications

R. Murray, T. Haxton, R. Janke, W. E. Hart, J. W. Berry, and C. A. Phillips (2010). "Sensor Network Design for Contamination Warning Systems: A Compendium of Research Results and Case Studies Using the TEVA-SPOT Software." U. S. Environmental Protection Agency, Office of Research and Development, National Homeland Security Research Center, Cincinnati OH. EPA/600/R-09/141.

Selected Invited Presentations/Participation

Institute for Mathematics and its Applications, Workshop on Algorithms for Parallel Processing, Sept. 1996.

Workshop on Combinatorial Approximation Algorithms, Schloss Dagstuhl, August 1997

Workshop on Scheduling in Computer and Manufacturing Systems, Schloss Dagstuhl, October, 1999, June 2002, June 2004.

Center for Discrete Mathematics and Computer Science (DIMACS) workshop on Computing Approximate Solutions to NP-hard Problems, Februrary, 2000.

ACM Symposium on Parallel Algorithms and Architectures, July, 2000.

International Symposium on Mathematical Programming, August, 2000, 2009.

Workshop on Algorithm Engineering and Experiments (ALENEX), January, 2002.

Workshop on Network Interdiction and Stochastic Programming, March, 2002.

Workshop on Experimental Algorithmics, Schloss Dagstuhl, September, 2000, September 2002.

Workshop on Parallelism in Algorithms and Architectures, March, 2003.

Workshop on Women of Applied Mathematics: Research and Leadership, senior invited participant.

SIAM Conference on Parallel Processing for Scientific Computing, plenary speaker, 2004.

Principal Lecturer, DIMACS Reconnect Workshop, "Experimental algorithmics with a focus on branch and bound for discrete optimization problems," June 2004.

Eighth Seminar on the Latest Advances in Computer Science (LACS), also called UAI 2004 (Últimos Avances en Informática), La Laguna University, Tenerife,Spain, November 2004.

Workshop on Scheduling for New Emerging Applications, Centre International de Recontres Mathematiques (C.I.R.M), Luminy-Marseille, France, June 2006.

DIMACS Workshop on COIN-OR, July, 2006.

Operations Research 2007 (GOR 2007), Saarbrucken, Germany, semi-plenary speaker.

Workshop on New Challenges in Scheduling Theory, Centre International de Recontres Mathematiques (C.I.R.M), Luminy-Marseille, France, May 2008, and follow on in Frejus, France, September 2010, October 2012; Aussois, France April 2014, March 2016, April 2018

Senior invited speaker/mentor, Advanced Career Mentoring Workshop (CAPP-L), CRA-W, November, 2008.

Workshop on Mixed-Integer Nonlinear Optimization: Algorithmic Advances and Applications, Institute for Mathematics and its Applications, November, 2008

Workshop on Algorithms and Data Structures, Bertinoro, Italy, June, 2009, 2011

Semi-plenary invited talk SIAM Annual Meeting, July 2009

CRA-W Distinguished lecture, University of Texas at San Antonio, March, 2010

Bay Area Discrete Math Day, April 2010 (invited major speaker)

MILCOM 2011, invited talk

Graph Exploitation Seminar (Lincoln Labs), April 2011

NSF Workshop on Research Directions in the Principles of Parallel Computation, 2012, invited speaker

CRA-W Distinguished lecture, UTEP/NMSU, April 2013

Network Inference Workshop, Santa Fe Institute, May 2013

Workshop on Parallel and Distributed Algorithms for Inference and Optimization, Simons Institute for the Theory of Computing, October 2013

Nebraska Conference on Undergraduate Women in Mathematics, invited plenary speaker, February, 2014.

Conference on Data Analysis, invited speaker, March 2014

Invited plenary speaker, SIAM Conference on Optimization, May 2014

Invited keynote speaker, Workshop on Education for High-Peformance Computing (EduHPC) 2015, a workshop at SuperComputing 2015.

Invited speaker, New York City Theory Day, April, 2016

Distinguished lecture, University of Tennessee division of Engineering, March 2017.

Invited talk, First Data Institute SF Annual Conference (DSCO17), October 2017

Invited talk, Chesapeake Large-Scale Analytics Conference (CLSAC 2017), October 2017

Invited talk, Conference on Data Analysis (CoDA 2018), March 2018

Workshop on High-Performance Graph Algorithms, Schloss Dagstuhl, June 2018

Seminar on Theoretical Foundations of Storage Systems, Schloss Dagstuhl, March, 2019

Jack Kilby Lecture (plenary), Government Microcircuit Applications & Critical Technology Conference (GOMACTech), March, 2019.

Keynote talk, IEEE Workshop on Parallel and Distributed Scientific Engineering Computing (PDSEC) [part of IPDPS], May 2019.

NSF Institute Planning Workshop, "Planning a sustainable ecosystem for incorporating parallel and distributed computing into undergraduate education", 2019.

Workshop on Topics in Graph Algorithms and their Applications TRIPODS workshop (run by Tufts NSF Tripods Institute in Foundations of Data Science), invited talk, 2021

Symposium on Algorithmic Principles of Computer Systems (APoCS), invited talk, 2022.

Symposium on Experimental Algorithms (SEA), invited talk, 2022.

Seminar on Scalable Data Structures, Schloss Dagstuhl, May, 2023