

Aparna Chandramowlishwaran

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Department of Electrical Engineering and Computer Science

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Research Areas

AI for Physics, Scientific Machine Learning, High-Performance Computing, Parallel Algorithms

Education

- 2007 – 2013 **Georgia Institute of Technology**, Atlanta, GA
M.S/Ph.D., Computational Science and Engineering
Dissertation: *The Fast Multipole Method at Exascale.*
- 2003 – 2007 **Anna University**, Chennai, India
B.E., Computer Science and Engineering.

Professional Experience

- 2026 - present **University of California**, Irvine, CA
Professor, EECS.
- 2020 - 2026 **University of California**, Irvine, CA
Associate Professor, EECS.
- 2015 - 2020 **University of California**, Irvine, CA
Assistant Professor, EECS.
- Summer 2019 **Argonne National Lab**, Lemont, IL
Visiting Scientist.
- Summer 2016 **Microsoft Research**, Redmond, WA
Visiting Researcher.
- 2013 - 2014 **Massachusetts Institute of Technology**, Cambridge, MA
Research Scientist, CSAIL.

Research Honors and Awards

- 2018 **Google Faculty Research Award**
- 2018 **NSF CAREER Award**
- 2018 **Best Poster Award**, *IEEE Int'l Conf. Parallel and Distributed Systems (ICPADS).*
- 2017-2018 **Innovation in Teaching award**, *UCI School of Engineering.*
- 2010 **Gordon Bell Prize**, *ACM/IEEE Supercomputing (SC).*

- 2010 **Best Paper Award**, *IEEE Int'l. Parallel and Distributed Processing Symposium (IPDPS)*.
- 2010 **Outstanding Graduate Research Assistant award**, *College of Computing, Georgia Institute of Technology*.
- 2009 **Best Paper Finalist**, *ACM/IEEE Supercomputing (SC)*.
- 2007 **Best all-round performer award**, *Undergraduate class of Computer Science and Engineering*.

Fellowships

- 2012-2013 **Intel PhD Fellowship**
- 2011 **Microsoft Research PhD Fellowship Finalist**
- 2010-2011 **ACM/IEEE George A. Michael Memorial HPC Fellowship**

Publications

The names that appear in **boldface** are directly supervised undergraduate, graduate (MS, PhD) and postdoctoral students at UCI.

Journal Articles

- [J12] Sanghyeon Chang, **Srikar Arani**, Nishant Sai Nuthalapati, Youngjoon Suh, Nicholas Choi, Siavash Khodakarami, Md Rakibul Hasan Roni, Nenad Miljkovic, Aparna Chandramowlishwaran, and Yoonjin Won. Eventflow: Real-time neuromorphic event-driven classification of two-phase boiling flow regimes. *Droplet*, page e70066, 2026.
- [J11] Wael Fatnassi, **Arthur Feeney**, Valen Yamamoto, Aparna Chandramowlishwaran, and Yasser Shoukry. BERN-NN-IBF: Enhancing Neural Network Bound Propagation Through Implicit Bernstein Form and Optimized Tensor Operations. *IEEE Transactions on Computer-Aided Design of Integrated Circuits and Systems*, 43(11):4334–4345, 2024.
- [J10] Youngjoon Suh, Aparna Chandramowlishwaran, and Yoonjin Won. Recent progress of artificial intelligence for liquid-vapor phase change heat transfer. *npj Computational Materials*, 10(1):1–14, 2024.
- [J9] **Hengjie Wang**, Robert Planas, Aparna Chandramowlishwaran, and Ramin Bostanabad. Mosaic flows: A transferable deep learning framework for solving pdes on unseen domains. *Computer Methods in Applied Mechanics and Engineering*, 389:114424, 2022.
- [J8] **Behnam Pourghassemi**, Ardalan Amiri Sani, and Aparna Chandramowlishwaran. Only relative speed matters: Virtual causal profiling. *ACM SIGMETRICS Performance Evaluation Review*, 48(3):113–119, 2021.
- [J7] **Rohit Zambre**, Damodar Sahasrabudhe, Hui Zhou, Martin Berzins, Aparna Chandramowlishwaran, and Pavan Balaji. Logically Parallel Communication for Fast MPI+Threads Applications. *IEEE Transactions on Parallel and Distributed Systems*, 32(12):3038–3052, 2021.
- [J6] **Shu-Mei Tseng**, Bogdan Nicolae, Franck Cappello, and Aparna Chandramowlishwaran.

Demystifying asynchronous I/O Interference in HPC applications. *The International Journal of High Performance Computing Applications*, 35(4):391–412, 2021.

- [J5] **Behnam Pourghassemi, Jordan Bonecutter**, Zhou Li, and Aparna Chandramowlishwaran. adPerf: Characterizing the Performance of Third-party Ads. *Proceedings of the ACM on Measurement and Analysis of Computing Systems*, 5(1):1–26, 2021. SIGMETRICS Acceptance rate: [38/315=12%].
- [J4] Damodar Sahasrabudhe, **Rohit Zambre**, Aparna Chandramowlishwaran, and Martin Berzins. Optimizing the hypre solver for manycore and GPU architectures. *Journal of Computational Science*, 49:101279, 2021.
- [J3] **Behnam Pourghassemi**, Ardalan Amiri Sani, and Aparna Chandramowlishwaran. What-if analysis of page load time in web browsers using causal profiling. *Proceedings of the ACM on Measurement and Analysis of Computing Systems (POMACS)*, 3(2):27, June 2019. **Nominated for Best Paper**. SIGMETRICS Acceptance rate: [50/317=15.8%].
- [J2] Zhihao Yao, Zongheng Ma, Yingtong Liu, Ardalan Amiri Sani, and Aparna Chandramowlishwaran. Sugar: Secure gpu acceleration in web browsers. *ACM SIGPLAN Notices*, 53(2):519–534, 2018. ASPLOS Acceptance rate: [56/319=17.6%].
- [J1] Ilya Lashuk, Aparna Chandramowlishwaran, Harper Langston, Tuan-Ahn Nguyen, Rahul Sampath, Aashay Shringarpure, Richard Vuduc, Lexing Ying, Denis Zorin, and George Biros. A massively parallel adaptive Fast Multipole Method on heterogeneous architectures. *Communications of the ACM (CACM)*, 55(5):101–109, May 2012.
Paper [J1] is from research prior to joining UCI.

Conference Publications

- [C31] **Arthur Feeney, Xianwei Zou, Sheikh Md Shakeel Hassan, Siddhartha Rachabathuni**, and Aparna Chandramowlishwaran. NUCLEUS: A unified model of boiling with mixture of experts. In *Proceedings of the ACM SIGKDD Conference on Knowledge Discovery and Data Mining (KDD)*, 2026.
- [C30] **Xianwei Zou, Sheikh Md Shakeel Hassan, Arthur Feeney**, and Aparna Chandramowlishwaran. History-bootstrapped flow matching for inverse boiling reconstruction. In *Proceedings of the International Conference on Machine Learning (ICML)*, 2026. Acceptance rate: [6352/23918=26.6%].
- [C29] **Sheikh Md Shakeel Hassan, Xianwei Zou**, Akash Dhruv, Vishwanath Ganesan, and Aparna Chandramowlishwaran. Bubbleformer: Forecasting Boiling with Transformers. *Advances in Neural Information Processing Systems*, 2025. **Spotlight**. NeurIPS Oral+Spotlight Acceptance rate: 3.2%.
- [C28] **Zitong Li** and Aparna Chandramowlishwaran. Fused3S: Fast Sparse Attention on Tensor Cores. In *Proceedings of the 39th ACM International Conference on Supercomputing (ICS)*, pages 104–118, 2025. Acceptance rate: [83/320=26%].
- [C27] **Sheikh Md Shakeel Hassan, Arthur Feeney**, Akash Dhruv, Jihoon Kim, Youngjoon Suh, Jaiyoung Ryu, Yoonjin Won, and Aparna Chandramowlishwaran. BubbleML: A

multiphase multiphysics dataset and benchmarks for machine learning. *Advances in Neural Information Processing Systems*, 36:418–449, 2023. **Spotlight**. NeurIPS Oral+Spotlight Acceptance rate: $[445/12343=3.6\%]$.

- [C26] **Arthur Feeney, Zitong Li**, Ramin Bostanabad, and Aparna Chandramowliswaran. Breaking Boundaries: Distributed Domain Decomposition with Scalable Physics-Informed Neural PDE Solvers. In *SC23: International Conference for High Performance Computing, Networking, Storage and Analysis*, pages 1–15, 2023. Acceptance rate: $[90/376=23.9\%]$.
- [C25] **Octavi Obiols-Sales**, Abhinav Vishnu, Nicholas Malaya, and Aparna Chandramowliswaran. ADARNet: Deep Learning Predicts Adaptive Mesh Refinement. In *Proceedings of the 52nd International Conference on Parallel Processing (ICPP)*, pages 524–534, 2023. Acceptance rate: $[82/282=29.1\%]$.
- [C24] **Rohit Zambre** and Aparna Chandramowliswaran. Lessons learned on MPI+ threads communication. In *SC22: International Conference for High Performance Computing, Networking, Storage and Analysis*, pages 1–16. IEEE, 2022. Acceptance rate: $[75/320=23.4\%]$.
- [C23] **Octavi Obiols-Sales**, Abhinav Vishnu, Nicholas P Malaya, and Aparna Chandramowliswaran. SURFNet: Super-resolution of Turbulent Flows with Transfer Learning using Small Datasets. In *30th International Conference on Parallel Architectures and Compilation Techniques (PACT)*, pages 331–344, 2021. Acceptance rate: 19%.
- [C22] **Hengjie Wang** and Aparna Chandramowliswaran. Pencil: A Pipelined Algorithm for Distributed Stencils. In *Proceedings of the International Conference for High Performance Computing, Networking, Storage and Analysis (SC)*, pages 1–16, 2020. Acceptance rate: $[95/378=25.1\%]$.
- [C21] **Behnam Pourghassemi**, Chenghao Zhang, Joo Hwan Lee, and Aparna Chandramowliswaran. On the Limits of Parallelizing Convolutional Neural Networks on GPUs. In *Proceedings of the 32nd ACM Symposium on Parallelism in Algorithms and Architectures (SPAA)*, 2020.
- [C20] **Rohit Zambre**, Aparna Chandramowliswharan, and Pavan Balaji. How I learned to stop worrying about user-visible endpoints and love MPI. In *Proceedings of the 34th ACM International Conference on Supercomputing (ICS)*, pages 1–13, 2020. Acceptance rate: $[40/132=30\%]$.
- [C19] **Octavi Obiols-Sales**, Abhinav Vishnu, Nicholas Malaya, and Aparna Chandramowliswharan. CFDNet: A deep learning-based accelerator for fluid simulations. In *Proceedings of the 34th ACM International Conference on Supercomputing (ICS)*, pages 1–12, 2020. Acceptance rate: $[40/132=30\%]$.
- [C18] **Shu-Mei Tseng**, Bogdan Nicolae, George Bosilca, Emmanuel Jeannot, Aparna Chandramowliswaran, and Franck Cappello. Towards portable online prediction of network utilization using MPI-level monitoring. In *Proc. 25th International Conference on Parallel and Distributed Computing (EuroPar)*, Goettingen, Germany, August 2019. Acceptance rate: $[38/144=26.4\%]$.

- [C17] **Rohit Zambre**, Megan Grodowitz, Aparna Chandramowliswaran, and Pavel Shamis. Breaking band: A breakdown of high-performance communication. In *Proc. 48th International Conference on Parallel Processing (ICPP)*, Kyoto, Japan, August 2019. Acceptance rate: [106/405=26%].
- [C16] **Hengjie Wang** and Aparna Chandramowliswaran. Multi-criteria partitioning of multi-block structured grids. In *Proc. ACM International Conference on Supercomputing (ICS)*, pages 261–271, Phoenix, AZ, USA, June 2019. Acceptance rate: [45/193=23.3%].
- [C15] **Laleh Aghababaie Beni**, **Saikiran Ramanan**, and Aparna Chandramowliswaran. Portal: A high-performance language and compiler for parallel N-body problems. In *Proc. 33rd IEEE Int’l. Parallel and Distributed Processing Symp. (IPDPS)*, Rio de Janeiro, Brazil, May 2019. Acceptance rate: [103/372=27.7%].
- [C14] **Rohit Zambre**, Aparna Chandramowliswaran, and Pavan Balaji. Scalable communication endpoints for MPI+Threads applications. In *Proc. IEEE 24th International Conference on Parallel and Distributed Systems (ICPADS)*, pages 803–812, Singapore, December 2018. **Best Poster**.
- [C13] **Bahareh Mostafazadeh**, **Ferran Marti**, Feng Liu, and Aparna Chandramowliswaran. Roofline guided design and analysis of a multi-stencil CFD solver for multicore performance. In *Proc. 32nd IEEE Int’l. Parallel and Distributed Processing Symp. (IPDPS)*, pages 753–762, Vancouver, British Columbia, Canada, May 2018. Acceptance rate: [113/461=24.5%].
- [C12] **Behnam Pourghassemi** and Aparna Chandramowliswaran. cudaCR: An in-kernel application-level checkpoint/restart scheme for CUDA-enabled GPUs. In *Proc. IEEE International Conference on Cluster Computing (CLUSTER)*, Hawaii, USA, September 2017.
- [C11] **Laleh Aghababaie Beni** and Aparna Chandramowliswaran. PASCAL: A Parallel Algorithmic SCALable framework for N-body problems. In *Proc. 23rd International Conference on Parallel and Distributed Computing (EuroPar)*, pages 482–496, Santiago de Compostela, Spain, August 2017. Acceptance rate: [50/176=28.4%].
- [C10] **Bahareh Mostafazadeh Davani**, Ferran Marti, Behnam Pourghassemi, Feng Liu, and Aparna Chandramowliswaran. Unsteady Navier-Stokes flow on GPU architectures. In *Proc. 23rd AIAA Computational Fluid Dynamics Conference*, Denver, CO, USA, June 2017.
- [C9] **Rohit Zambre**, Lars Bergstrom, **Laleh A. Beni**, and Aparna Chandramowliswaran. Parallel performance-energy predictive modeling of browsers: Case study of Servo. In *Proc. IEEE Int’l Conf. on High Performance Computing, Data, and Analytics (HiPC)*, Hyderabad, India, December 2016. Acceptance rate: [40/160=25%].
- [C8] Aparna Chandramowliswaran, Jee Whan Choi, Kamesh Madduri, and Richard Vuduc. Brief Announcement: Towards a communication optimal Fast Multipole Method and its implications at exascale. In *Proc. ACM Symposium on Parallel Algorithms and Architectures (SPAA)*, Pittsburgh, PA, June 2012.
- [C7] Aparna Chandramowliswaran, Kamesh Madduri, and Richard Vuduc. Diagnosis, tuning, and redesign for multicore performance: A case study of the Fast Multipole Method. In

Proc. ACM/IEEE Conf. Supercomputing (SC), New Orleans, LA, USA, November 2010. Acceptance rate: [51/253=20.2%].

- [C6] Abtin Rahimian, Ilya Lashuk, Dhairya Malhotra, Aparna Chandramowliswaran, Logan Moon, Rahul Sampath, Aashay Shringarpure, Shravan Veerapaneni, Jeffery Vetter, Richard Vuduc, Denis Zorin, and George Biros. Petascale direct numerical simulation of blood flow on 200k cores and heterogeneous architectures. In *Proc. ACM/IEEE Conf. Supercomputing (SC)*, New Orleans, LA, USA, November 2010. **Gordon Bell Prize**. Acceptance rate: [51/253=20.2%].
- [C5] Aparna Chandramowliswaran, Samuel Williams, Leonid Oliker, Ilya Lashuk, George Biros, and Richard Vuduc. Optimizing and tuning the Fast Multipole Method for state-of-the-art multicore architectures. In *Proc. IEEE Int'l. Parallel and Distributed Processing Symp. (IPDPS)*, Atlanta, GA, USA, April 2010. Acceptance rate: [127/527=24.1%].
- [C4] Aparna Chandramowliswaran, Kathleen Knobe, and Richard Vuduc. Performance evaluation of Concurrent Collections on high-performance multicore computing systems. In *Proc. IEEE Int'l. Parallel and Distributed Processing Symp. (IPDPS)*, Atlanta, GA, USA, April 2010. **Best Paper (software track)**. Acceptance rate: [127/527=24.1%].
- [C3] Aparna Chandramowliswaran, Kathleen Knobe, and Richard Vuduc. Applying the Concurrent Collections programming model to asynchronous parallel dense linear algebra. In *Proc. ACM SIGPLAN Symp. Principles and Practice of Parallel Programming (PPoPP)*, Bangalore, India, January 2010. (poster). Acceptance rate: [Papers+posters: 45/173=26.1%].
- [C2] Ilya Lashuk, Aparna Chandramowliswaran, Harper Langston, Tuan-Anh Nguyen, Rahul Sampath, Aashay Shringarpure, Richard Vuduc, Lexing Ying, Denis Zorin, and George Biros. A massively parallel adaptive Fast Multipole Method on heterogeneous architectures. In *Proc. ACM/IEEE Conf. Supercomputing (SC)*, Portland, OR, USA, November 2009. **Finalist, Best Paper**. Acceptance rate: [59/261=22.6%].
- [C1] David A. Bader, Aparna Chandramowliswaran, and Virat Agarwal. On the design of fast pseudo-random number generators for the Cell Broadband Engine and an application to risk analysis. In *Proc. 37th Int'l. Conf. Parallel Processing (ICPP)*, Portland, OR, USA, September 2008. Acceptance rate: [81/263=30.8%].

Papers [C1]-[C8] are from research prior to joining UCI.

Workshop Publications (Peer-reviewed)

- [W7] Jee Whan Choi, Aparna Chandramowliswaran, Kamesh Madduri, and Richard Vuduc. A CPU-GPU hybrid implementation and model-driven scheduling of the Fast Multipole Method. In *Proc. 7th Wkshp. on General-purpose Processing using GPUs (GPGPU-7)*, Salt Lake City, UT, USA, March 2014. ACM.
- [W6] Richard Vuduc, Kenneth Czechowski, Aparna Chandramowliswaran, and Jee Whan Choi. Courses in high-performance computing for scientists and engineers. In *Proc. NSF/TCPP Workshop on Parallel and Distributed Computing Education (EduPar)*, Shanghai, China, May 2012.

- [W5] Kenneth Czechowski, Casey Battaglini, Chris McClanahan, Aparna Chandramowliswaran, and Richard Vuduc. Balance principles for algorithm-architecture co-design. In *Proc. USENIX Wkshp. on Hot Topics in Parallelism (HotPar)*, Berkeley, CA, USA, May 2011.
 - [W4] Richard Vuduc, Aparna Chandramowliswaran, Jee Whan Choi, Murat Efe Guney, and Aashay Shringarpure. On the limits of GPU acceleration. In *Proc. USENIX Wkshp. on Hot Topics in Parallelism (HotPar)*, Berkeley, CA, USA, June 2010.
 - [W3] Zoran Budimlić, Aparna Chandramowliswaran, Kathleen Knobe, Geoff Lowney, Vivek Sarkar, and Leo Treggiari. Multi-core implementations of the Concurrent Collections programming model. In *Proc. Wkshp. Compilers for Parallel Computing (CPC)*, Zürich, Switzerland, January 2009.
 - [W2] Zoran Budimlić, Aparna Chandramowliswaran, Kathleen Knobe, Geoff Lowney, Vivek Sarkar, and Leo Treggiari. Declarative aspects of memory management in the Concurrent Collections parallel programming model. In *Workshop on Declarative Aspects of Multicore Programming (DAMP)*, Savannah, GA, USA, January 2009.
 - [W1] Aparna Chandramowliswaran, Abhinav Karhu, Ketan Umare, and Richard Vuduc. Numerical algorithms with tunable parallelism. In *Proc. Wkshp. Software Tools for Multicore Systems (STMCS), at IEEE/ACM Int'l. Symp. Code Generation and Optimization (CGO)*, Boston, MA, USA, April 2008.
- Papers [W1]-[W7] are from research prior to joining UCI.*

Poster Presentations (Peer-reviewed)

- [P10] **Arthur Feeney**, Ying Wai Li, and Aparna Chandramowliswaran. GPU Kernels for Mixture of Experts. In *ACM/IEEE Conf. Supercomputing (SC)*, November 2025.
- [P9] **Sebastian Barschkis**, **Zitong Li**, Hengjie Wang, and Aparna Chandramowliswaran. Neural Domain Decomposition for Variable Coefficient Poisson Solvers. In *ACM/IEEE Conf. Supercomputing (SC)*, November 2023.
- [P8] **Rohit Zambre**, Abdelhalim Amer, Aparna Chandramowliswaran, and Pavan Balaji. Evaluating multiple endpoints for MPI with libibverbs. In *EuroMPI Conference*, Chicago, IL, USA, September 2017.
- [P7] **Bahareh Mostafazadeh**, Ferran Marti, Feng Liu, and Aparna Chandramowliswaran. Laminar unsteady Navier-Stokes flow on multicore architectures. In *ACM/IEEE Conf. Supercomputing (SC)*, Salt Lake City, UT, USA, November 2016.
- [P6] Travis Bartley, Mona Elkoussy, Anima Anandkumar, and Aparna Chandramowliswaran. Minimizing communication for tensor decompositions. In *ACM/IEEE Conf. Supercomputing (SC)*, Salt Lake City, UT, USA, November 2016.
- [P5] **Rohit Zambre**, Lars Bergstrom, **Laleh A. Beni**, and Aparna Chandramowliswaran. Parallel performance-energy predictive modeling of browsers: Case study of servo. In *ACM/IEEE Conf. Supercomputing (SC)*, Salt Lake City, UT, USA, November 2016.
- [P4] **Bahareh Mostafazadeh**, Ferran Marti, Feng Liu, and Aparna Chandramowliswaran. Parallel algorithms for unsteady Navier-Stokes flow on GPU architectures. In *GPU Technology Conference*, Silicon Valley, CA, USA, March 2016.

- [P3] **Laleh A. Beni** and Aparna Chandramowliswaran. PEAK: Parallel EM Algorithm using Kd-tree. In *ACM/IEEE Conf. Supercomputing (SC)*, Austin, TX, USA, November 2015. **Best Poster Finalist.**
- [P2] Aparna Chandramowliswaran and Richard Vuduc. Communication-optimal parallel n-body solvers. In *Proc. 26th IEEE Int'l. Parallel and Distributed Processing Symp. (IPDPS)*, Shanghai, China, May 2012.
- [P1] Aparna Chandramowliswaran. Parallel random number generation on the Cell Broadband Engine. In *SIAM Conf. on Parallel Processing for Scientific Computing*, Atlanta, GA, March 2008.
- Posters [P1]-[P2] are from research prior to joining UCI.*

Other Publications

- [O5] **Arthur Feeney, Kuei-Hsiang Huang**, and Aparna Chandramowliswaran. Mondrian: Transformer Operators via Domain Decomposition. *arXiv preprint arXiv:2506.08226*, 2025.
- [O4] Aparna Chandramowliswaran. Artificial Intelligence and High-Performance Computing: The Drivers of Tomorrow's Science. *SIAM News*, 53(8), October 2020.
- [O3] **Kasra Moazzemi**, Rainer Doemer, and Aparna Chandramowliswaran. A SystemC model for N-body problems and its parallel design space exploration. Technical Report 16-09, University of California, Center for Embedded and Cyber-Physical Systems, Irvine, CA, USA, November 2016.
- [O2] Aparna Chandramowliswaran, Kathleen Knobe, and Richard Vuduc. Performance evaluation of Concurrent Collections on high-performance multicore computing systems. Technical Report GT-CSE-10-01, Georgia Institute of Technology, Atlanta, GA, USA, February 2010.
- [O1] Aparna Chandramowliswaran. Multi-core implementations of the Concurrent Collections parallel programming model. In *CRA-W/CDC Programming Languages, Operating Systems, & Architecture Workshop (PLOS)*, Washington, DC, March 2009. (poster).
- Papers [O1]-[O2] are from research prior to joining UCI.*

Grants and Contracts

- July '25 - June '30 ProperAI: Engineering+ Society Institute on AI
Samueli School of Engineering, UCI
 Core PIs: Athina Markopoulou, Yasser Shoukry, Aparna Chandramowliswaran, Salma Elmalaki, Hyounjun Kwon, Zhou Li, Yanning Shen, Sameer Singh, and Alexandra Voloshina.
 Awarded: \$2.5M
- Aug '24 - July '29 ML4HEAT: Fundamentals of Machine Learning for Phase Change Heat Transfer
Office of Naval Research, MURI
 PIs: Yoonjin Won, Aparna Chandramowliswaran, Jiajun Wu, Matteo Bucci, Nenad Miljkovic, and William King.
 Awarded: \$6M

- June '24 - June '26 Designing and Constructing Next-Generation Hardware Acceleration for Program Analysis
ICS Research Award, UCI
 PIs: Joshua Garcia, Aparna Chandramowlishwaran, Sang-Woo Jun, Ian Harris, and Alberto Krone-Martins.
 Awarded: \$82,500
- June '22 - May '26 OAC Core: Geometry-aware and Deep Learning-based Cyberinfrastructure for Scalable Modeling of Solids and Fluids
National Science Foundation, Award 2211908
 PIs: Ramin Bostanabad and Aparna Chandramowlishwaran.
 Awarded: \$600,000
- Dec '21 - Dec '24 Learning and predicting flow boiling principles: A deep learning perspective
Office of Naval Research, N00014-22-1-2063
 PIs: Yoonjin Won and Aparna Chandramowlishwaran.
 Awarded: \$520,000
- Oct '19 - Sept '20 Exploring design strategies for MPI scalable endpoints
Argonne National Laboratory, DOE sub-contract 7F-30219
 PI: Aparna Chandramowlishwaran.
 Awarded: \$140,287
- Sept '19 - Aug '21 EAGER: N-Body Algorithms for Mobile and Social Data
National Science Foundation, Award 1939237
 PIs: Athina Markopoulou, Aparna Chandramowlishwaran, and Carter Butts.
 Awarded: \$300,000
- 2018 Scalable Tools for Profiling Web browsers
Google Faculty Research Award
 PI: Aparna Chandramowlishwaran.
 Awarded: \$75,000
- Oct '18 - Sept '21 MRI: Acquisition of a High-Performance Computing Cluster for Research and Teaching at UC Irvine
National Science Foundation, Award 1828779
 PIs: Aparna Chandramowlishwaran, Filipp Furche, and Dana Roode.
 Awarded: \$400,000, UCI cost share: \$171,429, Total: \$571,429
- Mar '18 - May '24 CAREER: HiPer: A CFD solver for High-Performance Turbulent Flow Simulations on Massively Parallel Machines
National Science Foundation, Award 1750549
 PI: Aparna Chandramowlishwaran.
 Awarded: \$516,000
- Oct '17 - Sept '19 Optimization Techniques for Network Fabric Resource Utilization
Argonne National Laboratory, DOE sub-contract 7F-30219
 PI: Aparna Chandramowlishwaran.
 Awarded: \$123,649

- 2016 Parallelizing the Web Browser for Performance and Energy-efficiency
Mozilla Research Grants
 PI: Aparna Chandramowliswaran.
 Awarded: \$76,078
- Sept '15 - Aug '16 What is the best on-chip architecture for N-body simulations?
Kane Kim Collaborative Fellowship
 PIs: Aparna Chandramowliswaran and Rainer Döemer.
 Awarded: \$50,000
- July '15 - June '18 XPS: EXPL: DSD: Portal: A Language and Compiler for Parallel N-body Computations
National Science Foundation, Award 1533917
 PI: Aparna Chandramowliswaran.
 Awarded: \$316,000

Invited Talks, Panels, Lectures, and Presentations

- Jan '27 A Foundation Model for Two-Phase Boiling. **Keynote Talk** at *Gordon Research Conference*.
- Oct '26 Foundation Models for Boiling: Benchmarks, Generalization, and Physics-Constrained Prediction. **Keynote Talk** at *ASME InterPACK 2026 Conference*.
- Oct '26 AI, Simulation, and the Future of Thermal Engineering: Practical Applications from Chips to Data Centers. **Invited Panelist** at *ASME InterPACK 2026 Conference*.
- Oct '25 Unstructured Sparsity Meets Tensor Cores: Lessons from Sparse Attention and MoE. **Invited Attendee and Speaker** at *Managing Parallelism Workshop*, Simons Institute for the Theory of Computing.
- Sept '25 Learning Boiling Physics: From Prediction to Forecasting. **Invited Talk** at *UCI-TAU Engineering + Society Conference*, Beckman Center at the National Academy of Sciences.
- May '25 Learning Boiling Dynamics with Transformers: From Prediction to Forecasting. **Invited Seminar** at *PDE and Applied Math seminar at UC Riverside*.
- Apr '25 Scaling AI for Scientific Discovery: Faster Kernels, Efficient Models, Better Physics. **Invited Seminar** at *Sandia National Lab*.
- Apr '25 Scaling AI for Scientific Discovery: Faster Kernels, Efficient Models, Better Physics. **Invited Seminar** at *Los Alamos National Lab*.
- May '24 Domain Decomposition meets Neural Operators: AI4Science at Scale. **Invited Talk** at *IAP AI and Cloud Workshop*.
- Mar '24 Domain Decomposition Methods for Neural PDE Solvers. **Contributed Talk** at *SIAM Conference on Parallel Processing for Scientific Computing*.
- Nov '23 TCHPC Career Panel. **Invited Panelist** at *Supercomputing Conference*.
- June '22 Deep Learning Surrogates: Transferability for Scalable Modeling of Fluids. **Keynote Talk** at *Micro Flow and Interfacial Phenomena (μ FIP) Conference*.

- June '21 Transferable Deep Learning Surrogates for PDEs. *Invited Seminar* at UCI Fluid Dynamics seminar.
- May '21 Transferable Deep Learning Surrogates for Solving PDEs. *Invited Seminar* at SPCL_Bcast at ETH Zurich, Online.
- Nov '20 Workshop on Artificial Intelligence and Machine Learning for Scientific Applications. *Invited Panelist* at AI4S at SC, Online.
- Feb '20 Accelerating Turbulent Fluid Simulations. *Keynote Talk* at the 11th International Workshop on Programming Models and Applications for Multicores and Manycores (co-held with PPoPP), San Diego, CA.
- Jan '20 Accelerating Turbulent Flow Simulations. *Invited Seminar* at Lawrence Berkeley National Lab, Berkeley, CA.
- Jan '20 AI-enhanced Turbulent Flow Simulations. *Invited Attendee and Speaker* at the Workshop on Future Directions in Extreme Scale Computing for Scientific Grand Challenges (NSF Frontera project), Austin, TX.
- June '19 Infrastructure: what scientists need from HPC, Clouds, and Big Data/ML systems. *Invited Panelist* at ScienceCloud 2019, Phoenix, AZ.
- November '18 Portal: A new domain-specific language for big data analytics. *Invited Speaker* at Intelligence 2025, Tel-Aviv, Israel.
- July '18 Introduction to Parallel Computing. *Distinguished Speaker* at UCI COSMOS – California State Summer School for Mathematics and Science, Irvine, CA.
- April '18 Life as an engineer/scientist. *Guest Speaker* at Athena Olympiad for Middle and High-School Girls, Irvine, CA.
- March '18 Roofline guided design and analysis of a multi-stencil CFD solver. *Invited Seminar* at Argonne National Laboratory, Argonne, IL.
- December '17 A Parallel Framework for Generalized N-body Problems. *Invited Seminar* at Imperial College, London.
- October '17 Should I port my code to a DSL?. *Invited Talk* at Dagstuhl Seminar 17431: Performance Portability in Extreme Scale Computing: Metrics, Challenges, Solutions, Germany.
- September '17 PASCAL: A Parallel Algorithmic SCALable Framework for N-body Problems. *23rd International Conference on Parallel and Distributed Computing (EuroPar)*, Santiago de Compostela, Spain.
- August '17 Design and Optimization of a Multi-stencil CFD Solver. *Invited Talk* at the 4th workshop on Programming Abstractions for Data Locality (PADAL), Chicago, IL.
- May '16 Performance and Productivity of N-body Solvers. *Invited Seminar* at the AI/ML Seminar, University of California, Irvine, CA.
- April '14 Performance and Productivity of N-body Solvers at Exascale and Beyond. *EECS Seminar*, University of California, Irvine, CA.
- March '13 FMM in CnC. *SIAM Conf. on Computational Science and Engineering*, Boston, MA.

- December '12 Fast Algorithms at Exascale and Beyond. *Invited Talk* at *International Workshop on Software for Petascale Numerical Simulation*, Kyoto, Japan.
- December '12 Fast Algorithms at Exascale and Beyond. *Invited Talk* at *Tokyo University*, Tokyo, Japan.
- October '12 Fast Algorithms at Exascale and Beyond. *IBM T. J. Watson Research Center*, Yorktown, NY.
- October '12 Fast Algorithms at Exascale and Beyond. *Invited Talk* at *Intel Corporation*, Hudson, MA.
- September '12 Fast Algorithms at Exascale and Beyond. *CS Seminar, The University of Chicago*, Chicago, IL.
- August '12 Performance Tuning and Analysis: Case Study of the Fast Multipole Method. *Invited Talk* at *DOE CSADS Workshop on Libraries and Autotuning for Extreme-scale Applications*, Snowbird, UT.
- June '12 Brief Announcement: Towards a Communication Optimal Fast Multipole Method and its Implications at Exascale. *ACM Symp. on Parallelism in Algorithms and Architectures (SPAA)*, Pittsburgh, PA.
- February '12 Performance Tuning and Analysis of the Fast Multiple Method from Multicore to Exascale. *Invited Seminar* at *CSE Seminar, Georgia Institute of Technology*, Atlanta, GA.
- February '12 Intra-node Performance Tuning and Analysis of Fast N-body methods from Multicore to Exascale. *SIAM Conf. on Parallel Processing*, Savannah, GA.
- November '11 Performance Tuning and Analysis of the Fast Multipole Method from Multicore to Exascale. *Award Talk* at *ACM/IEEE Conf. Supercomputing (SC)*, Seattle, WA.
- February '11 Diagnosis, Tuning, and Redesign for Multicore. *SIAM Conf. on Computational Science and Engineering*, Reno, NV.
- February '11 CnC for HPC. *SIAM Conf. on Computational Science and Engineering*, Reno, NV.
- January '11 Performance Evaluation of the 48-core Single Chip Cloud Computer. *International Center for Computational Sciences (ICCS) Workshop*, Berkeley, CA.
- November '10 Diagnosis, tuning, and redesign for multicore performance: A case study of the Fast Multipole Method. *ACM/IEEE Conf. Supercomputing (SC)*, New Orleans, LA.
- October '10 CnC for HPC. *The Second Annual Concurrent Collections Workshop, Rice University*, Houston, TX.
- April '10 Performance evaluation of Concurrent Collections on high-performance multicore computing systems. *IEEE Int'l. Parallel and Distributed Processing Symp. (IPDPS)*, Atlanta, GA.
- April '10 Optimizing and tuning the fast multipole method for state-of-the-art multicore architectures. *IEEE Int'l. Parallel and Distributed Processing Symp. (IPDPS)*, Atlanta, GA.

- February '10 Optimizing and Tuning the Fast Multipole Method for Multicore and Accelerator Systems. *SIAM Conf. on Parallel Processing*, Seattle, WA.
- August '09 Summer student presentation. *Lawrence Berkeley National Laboratory*, Berkeley, CA.
- July '09 Applying the Concurrent Collections Programming Model to Asynchronous Parallel Dense Linear Algebra. *First Concurrent Collections Workshop*, Intel Corporation, Hudson, MA.
- July '09 Hierarchical representation and reuse of computation in CnC. *First Concurrent Collections Workshop*, Intel Corporation, Hudson, MA.
- Fall '08 & '09 Concurrent Collections: A model for Parallel Programming. **Guest lecture** for Prof. Rich Vuduc's *HPC Tools and Applications* class.
- September '08 On the Design of Fast Pseudo-Random Number Generators for the Cell Broadband Engine and an Application to Risk Analysis. *The 37th International Conference on Parallel Processing (ICPP)*, Portland, OR.

Membership in Professional Societies

Member, ACM, IEEE, SIAM, and SIGHPC.

Conference/Journal Committee Activities

- 2026 **Reviewer**, *International Conference on Machine Learning (ICML)*.
- 2025-present **Inaugural Editorial Board**, *ACM Transactions on AI for Science (TAIS)*.
- 2025 **Program Committee**, *ACM International Conference on Supercomputing (ICS)*.
- 2024 **Technical Papers Co-Chair**, *ACM/IEEE Conf. Supercomputing (SC)*.
- 2024 **Organizing Committee and Panel Chair**, *SIAM Conference on Parallel Processing for Scientific Computing (PP)*.
- 2023-2026 **Reviewer**, *Neural Information Processing Systems (NeurIPS)*.
- 2023 **Performance Measurement, Modeling, and Tools Area Co-Chair**, *ACM/IEEE Conf. Supercomputing (SC)*.
- 2023 **Panel Chair, Scientific Machine Learning Panel**, *AI for Thermal Energy Science Workshop*.
- 2023 **Organizing Committee**, *AI for Thermal Energy Science Workshop*.
- 2022 **Research Posters Chair**, *ISC High Performance*.
- 2021-2025 **Editorial Board**, *IEEE Computing in Science and Engineering*.
- 2021 **ML for HPC Area Vice-Chair**, *ACM/IEEE Conf. Supercomputing (SC)*.
- 2021 **Invited Talks Committee**, *ACM/IEEE Conf. Supercomputing (SC)*.
- 2021 **ML, AI, and Emerging Technologies Track Chair**, *ISC High Performance*.
- 2021 **Research Posters Deputy Chair**, *ISC High Performance*.
- 2021 **General Co-Chair**, *IEEE Int'l. Parallel and Distributed Processing Symposium (IPDPS)*.

- 2021 **Minisymposium Organizer**, *SIAM Conference on Computational Science and Engineering*.
- 2021 **Program Committee**, *ACM SIGPLAN Symposium on Principles and Practice of Parallel Programming (PPoPP)*.
- 2020 **Panel Chair**, **Is AI transforming HPC or HPC transforming AI?**, *SIAM Conference on Parallel Processing for Scientific Computing (PP)*.
- 2020 **Program Committee, Algorithms track**, *ACM/IEEE Conf. Supercomputing (SC)*.
- 2020 **Program Committee**, *IEEE/ACM International Symposium on Cluster, Cloud, and Grid Computing (CCGrid)*.
- 2020 **Program Committee**, *ACM SIGMETRICS*.
- 2020 **Program Committee and Publicity Chair (Americas)**, *ACM SIGPLAN Symposium on Principles and Practice of Parallel Programming (PPoPP)*.
- 2019-2021 **Associate Editor**, *ACM Transactions on Parallel Computing (TOPC)*.
- 2019 **Program Committee**, *Int'l Conf. on Parallel Architectures and Compilation Techniques (PACT)*.
- 2019 **Program Committee, Applications track**, *ACM/IEEE Conf. Supercomputing (SC)*.
- 2019 **Program Committee, Panels**, *ACM/IEEE Conf. Supercomputing (SC)*.
- 2019 **Program Committee, Application and Algorithms track**, *HPC Asia*.
- 2019 **Program Committee**, *IEEE International Conference on Data Science and Systems (DSS)*.
- 2019 **External Review Committee**, *ACM International Conference on Supercomputing (ICS)*.
- 2019 **Program Committee**, *10th Workshop on Scientific Cloud Computing (ScienceCloud)*.
- 2019 **Program Committee**, *4th International Workshop on Scalable Computing For Real-Time Big Data Applications (SCRAMBL)*.
- 2019 **Program Committee, Experiments track**, *IEEE Int'l. Parallel and Distributed Processing Symposium (IPDPS)*.
- 2019 **Program Committee**, *ACM SIGPLAN Symposium on Principles and Practice of Parallel Programming (PPoPP)*.
- 2018 **Program Committee, Applications track**, *ACM/IEEE Conf. Supercomputing (SC)*.
- 2018 **Program Committee, Posters**, *ACM/IEEE Conf. Supercomputing (SC)*.
- 2018 **Program Committee, Algorithms track**, *IEEE Int'l. Parallel and Distributed Processing Symposium (IPDPS)*.
- 2018 **Program Committee**, *ACM SIGPLAN Symposium on Principles and Practice of Parallel Programming (PPoPP)*.

- 2018 **Program Committee, ACM student research competition**, *ACM Int'l. Conf. on Architectural Support for Programming Languages and Operating Systems (ASPLOS)*.
- 2018 **Program Committee, Algorithms Track**, *IEEE Int'l Conf. on High Performance Computing, Data and Analytics (HiPC)*.
- 2018 **Program Committee, Application, Algorithms, and Libraries**, *IEEE International Conference on Cluster Computing (CLUSTER)*.
- 2018 **Program Co-Chair**, *Fifth Annual Chapel Implementers and Users Workshop (CHI UW)*.
- 2018 **Program Committee**, *Supercomputing Asia conference*.
- 2017 **Program Committee, Applications Track**, *IEEE Int'l Conf. on High Performance Computing, Data and Analytics (HiPC)*.
- 2017 **Program Committee, Applications track**, *ACM/IEEE Conf. Supercomputing (SC)*.
- 2017 **Area Co-Chair, Application, Algorithms, and Libraries**, *IEEE International Conference on Cluster Computing (CLUSTER)*.
- 2016 **Program Committee, Applications Track**, *IEEE Int'l Conf. on High Performance Computing, Data and Analytics (HiPC)*.
- 2016 **Program Committee, Programming Systems**, *ACM/IEEE Conf. Supercomputing (SC)*.
- 2016 **Program Committee, Panels**, *ACM/IEEE Conf. Supercomputing (SC)*.
- 2016 **Extended Review Committee**, *Int'l Conf. on Parallel Architectures and Compilation Techniques (PACT)*.
- 2016 **Program Committee, Performance track**, *The 45th International Conference on Parallel Processing (ICPP)*.
- 2016 **Extended Review Committee**, *ACM SIGPLAN Symposium on Principles and Practice of Parallel Programming (PPoPP)*.
- 2015 **Program Chair**, *Concurrent Collections (CnC) Workshop at LCPC*.
- 2015 **Program Committee**, *IEEE International Symposium on Workload Characterization (IISWC)*.
- 2015 **Program Committee, Algorithms track**, *The 44th International Conference on Parallel Processing (ICPP)*.
- 2015 **Reviewer**, *ACM Transactions on Architecture and Code Optimization (TACO)*.
- 2014, 2015 **Program Committee**, *International Symposium on Computer Architecture and High Performance Computing (SBAC-PAD)*.
- 2014 **Program Committee, Applications track**, *IEEE Int'l. Parallel and Distributed Processing Symposium (IPDPS)*.
- 2014 **Program Committee**, *Workshop on Architecture, Languages, Compilation and Hardware support for Emerging Manycore systems (ALCHEMY) at ICCS*.

- 2014 **External Reviewer**, *Int'l Symp. on Code Generation and Optimization (CGO)*.
- 2013, 2015 **Reviewer**, *Journal Parallel Computing (ParCo)*.
- 2013 **Sub-reviewer**, *ACM Int'l conference on Computing Frontiers (CF)*.
- 2012 **Reviewer**, *IEEE Transactions on Parallel and Distributed Systems (TPDS)*.
- 2009, 2011-12 **External reviewer**, *ACM/IEEE Conf. Supercomputing (SC)*.
- 2012 **External reviewer**, *Innovative Parallel Computing Conference (InPar)*.
- 2010-12 **External reviewer**, *IEEE Int'l. Parallel and Distributed Processing Symposium (IPDPS)*.
- 2008, 2010 **External reviewer**, *Int'l Conference on Parallel Processing (ICPP)*.
- 2008, 2011 **External reviewer**, *ACM Symposium on Parallelism in Algorithms and Architectures (SPAA)*.
- 2008 **External reviewer**, *The Second Int'l Frontiers of Algorithmics Workshop (FAW)*.
- 2008 **External reviewer**, *Journal for Parallel and Distributed Computing (JPDC)*.

UC Irvine Activities and Service

- Fall 2024 Acting Associate Dean, SSoE Graduate and Professional Studies
- 2023-24 The Institute for Meaningful Engagement (TIME) Champion
- 2023 SSoE Review Committee for the UCI-LANL Fellowships
- 2023 EECS CAO Hiring Committee
- 2023 MECPS Fellowship Committee
- 2022-2025 EECS Graduate Advisor
- 2022-2025 SSoE Graduate Studies Committee
- 2021-2022 CpE Preliminary Exam Chair
- 2021-2022 EECS Faculty Search Committee
- 2019-2020 NSF Scholarships in Science, Technology, Engineering, and Mathematics (S-STEM) Program Faculty Mentor
- 2017-present UCI Research Cyberinfrastructure Center (RCIC) Executive Committee
- 2017-present UCI Research Cyberinfrastructure Center (RCIC) Advisory Committee
- 2017-2018 CSE Steering Committee
- 2017-2018 Microsoft Research Ph.D. Fellowship Program Faculty Review Committee
- 2016-2017 CSE Steering Committee - Vice Chair
- 2016-2017 CpE Lecturer with Security Of Employment (LSOE) Search Committee
- 2015-2017 EECS Strategic Planning Committee
- 2015-2016 Faculty Mentor Program (FMP) Fellowship Committee
- 2015-2016 President's Dissertation Year (PDY) Fellowship Committee
- 2015-2016 CSE Steering Committee
- 2015-2016 UCI Research Cyberinfrastructure (RCI) Vision workgroup

2015-2021 CpE Preliminary Exam (Algorithms)