

Laura C. Carrington

Performance Modeling & Characterization (PMAc) Lab
San Diego Supercomputer Center
University of California, San Diego
9500 Gilman Drive MC0505
La Jolla, California 92093-0505

Office: (858) 534-5063
lcarrington@sdsc.edu
<http://users.sdsc.edu/~lcarrington/>

Current Research

Dr. Carrington is an internationally recognized expert in the field of research in the performance and energy analysis of large-scale scientific applications on High Performance Computing (HPC) systems. Specific research areas include benchmark design and analysis, HPC workload analysis and characterization, cross-architectural development of application performance and power models, analysis and development of performance models of scientific workloads on accelerators (i.e. MIC, FPGAs and GPUs), tools in application and system analysis (i.e. processor and network simulators). Research utilizes performance and power models to analyze the interactions between scientific application and HPC system to reduce overall energy consumption or application-aware energy-efficient computing.

Education

Ph.D., 2000, Chemical Engineering, University of California, San Diego
M.S., 1995, Chemical Engineering, University of California, San Diego
B.S., 1992, Chemical Engineering, Rensselaer Polytechnic Institute

Employment

PMAc Lab Director **San Diego Supercomputer Center** 2012-Present
La Jolla, CA

Direct all research projects within the PMAc lab, which is focused on the advancement of HPC performance and energy analysis to guide scientific code development, improve architectural design, reduce energy consumption of HPC systems, and assist in informed system procurements. Pursue funding opportunities for PMAc research projects and manage funding of all staff and students.

V.P. of Research **EP Analytics** 2009-Present
San Diego, CA

Guide all research projects within the company and establish new funding. EP Analytics is focused on providing HPC application analysis expertise and tools to assess performance and energy benefits of new and current HPC technology for customer's workloads.

PMaC Lab Supervisor & Researcher **San Diego Supercomputer Center** 2000-2011
La Jolla, CA

Supervised and actively participated in the majority of PMaC's research projects, assisted in obtaining funding for the lab, researched performance model development for scientific applications on supercomputers with and without accelerators, and researched energy reduction techniques based on application performance analysis.

Scientific Programmer **San Diego Supercomputer Center** Aug.`97-2000
La Jolla, CA

Researched the performance of scientific applications on High Performance Computing (HPC) platforms in the Performance Modeling and Characterization (PMaC) lab. Worked with users' code to optimize and port to HPC platforms by participating in the Strategic Applications Collaborations (SAC) project. Taught sessions for NPACI training. Coordinated academic as well as industrial support for National Partnership for Advanced Computational Infrastructure (NPACI).

Research Assistant **UCSD Chemical Engineering Dept.** Sept.`92-Jul.`98
La Jolla, CA

Researched the surface reaction of carbon monoxide and oxygen on a supported platinum surface. Developed a kinetic model to numerically simulate the gas and surface concentration gradients of carbon monoxide that appear under the coupled non-linear behavior of adsorption, desorption, reaction and diffusion in a porous platinum catalyst subject to dynamic conditions. Verification of the simulations was carried out by utilizing a unique ultra-high vacuum experimental system capable of measuring gas concentrations at the center of a one-dimensional catalyst pellet.

Associate In Engineering **UCSD Applied Mechanics & Engineering Sciences** Mar.`98-Jun.`98
La Jolla, CA

Course instructor for a large undergraduate class in Quantitative Computer Skills. Responsible for designing the content of the course and lecture. Developed homework, exams, and the final project. Responsible for managing teaching assistants for the course.

Head Teaching Asst. **UCSD Chemical Engineering Dept.** Jan `96-Aug.`97
La Jolla, CA

Responsible for organizing and coordinating teaching assistants for large course. Accountable for developing homework, exams, and the final project for the course. In charge of teaching computer lab sections, monitoring exams, and tabulating final course grades.

Chem. Engr. Intern **Microbial Environmental Services** May `92-Aug.`92
Des Moines, IA

Worked on designing a system to classify soil characteristics needed for in-situ soil decontamination. Conducted various tests on contaminated soil in order to determine applicability of using Microbial's technology to decontaminate the soil.

Research Assistant **Rensselaer Chemical Engr. Dept.** Jan. `90-May`92
Troy, NY

Set-up and operated a reverse osmosis apparatus in an investigation of the recyclability of hazardous hydrofluoric acid waste generated during semiconductor production. Researched the idea of using pulsating flow to reduce polarization of ultrafiltration spiral wound membranes.

Engineering Intern **Xerox Corp.** Chemical Analysis Dept. May `91-Aug.`91
Rochester, NY

Determined the effectiveness of a fiber optics NIR probe for in-line testing of the quality of ink. Designed a process for blending and packaging ink jet heads using formulation robots. Researched the installation of an acoustical probe and monitor for in-line testing of a specific constituent present in metal polymer suspension solutions.

Engineering Intern **Eastman Kodak Co.** Research & Engr. Dept. July `90-Aug. `90
Rochester, NY

Conducted preliminary experiments for problems encountered with an ultrafiltration production process. Analyzed the data, presented results, and recommended further experimentation.

EXTERNAL FUNDING

- PI for UCSD on Institute for Sustained Performance, Energy, and Resilience (SUPER) DoE SciDAC-3 and lead for the energy efficiency thrust for the institute, (DOE-DE-SC0006620), FY11-FY16 (\$1075K).
- PI for UCSD on Intel Parallel Computing Center, (Intel gift fund), FY16, (\$100K).
- PI on INTEL sub contract SDSC Performance Modeling and Characterization, FY14-FY15, (\$430K).
- PI for UCSD on Analysis and Mutual Interference Classification Agent, (LLNL-B608905), FY15, (\$150K).
- Co-PI for UCSD NSF ADAMENT (NSF CCF 1451598), FY15,(\$89K).
- PI on Beyond the Standard Model (BSM) – Modeling of Performance and Power, (PNNL/Sub DOE-DE-AC05-76RL01830), FY13-FY15, (\$500K).
- PI for UCSD on High Performance Computing Research Program Proposal, (DOE GOCO OPERAT/4000069422), FY08-FY13, (\$950K).
- PI on Intel Xstack, (Intel Corporation/Sub DOE-DE-SC0008717), FY13-FY15, (\$585K).
- Co-PI on FLASH-based data-intensive supercomputing for graph analytics, Maya Gokhale PI, FY13-FY15, (\$469K).
- PI on THRIFTY: An Exascale Architecture for Energy Proportional Computing (DOE-DE-SC0005104), FY10-FY14, (\$474K).
- PI on LLNL Performance Modeling and Analysis Study, (LLNL-B600667), FY13, (\$186K).

- PI on Creating a New Paradigm for Computer Architecture and Implementation: the 10x10 Idea (University of Chicago/Sub NSF-OCI-1237524), FY13, (\$80K).
- PI on Prototype I/O Convolver (NSF-OCI-0951583), FY09-FY14, (\$300K).
- PI for EP Analytics on HPCMP HASI with DTRA (sub contract with George Mason), FY15-FY18 (\$735K)
- PI for EP Analytics on HPCMP PETTT Special Project (DoD- 14463-PETTT-PLI), FY10-FY14 (\$2,231K)
- PI for EP Analytics on Systematic Software-Hardware Heterogeneity for Power-efficient Embedded Computing, (DARPA-BAA-12-24), FY13-FY16 (\$720K).
- PI for EP Analytics on Co-Design Approach for Advances in Software and Hardware (Air Force Office of Scientific Research FA9550-12-1-0476), FY13-FY17 (\$1,074K).
- PI for EP Analytics on the HPCMP PETTT Performance Analysis of DoD Application Codes, (DoD-PP-ACE-KY01-KY03), FY10-FY12 (\$397K)
- PI for EP Analytics on HPCMP PETTT HCPMP Workload Analysis for Future Acceleration Hardware, (DoD-PP-ACE-KY01-KY02), FY10-FY11, (\$311K).
- PI on HPC Improvement: IPM-A Performance Monitoring Environment for Petascale High-Performance Computing Systems (NSF-0721397), FY07-FY12 (\$1,963K).
- PI on University of Illinois supplement to Leadership Class Scientific and Engineering Computing (UNIC-20100413), FY10-FY12, (\$409K).
- Co-PI on the Cyberinfrastructure Evaluation Center, (NSF-OCI-0516162) Allan Snively PI, Dan Reed is equal collaborative PI, FY05-FY08, (\$999K UCSD budget).
- Co-PI Performance Engineering Research Center (PERC), (DE-FC02-06ER25760) a DOE SciDAC Integrated Software Infrastructure Center, Robert Lucas PI, Allan Snively Co-PI, FY07-FY12 (\$1,358K UCSD budget).
- Co-PI on the Performance Evaluation Research Institute (PERI) (DE-FC02-01ER2541) a DOE SciDAC Integrated Software Infrastructure Center, Robert Lucas PI, Allan Snively Co-PI, FY02-FY07 (\$541K UCSD budget).

- Co-PI on the High Performance Computing Benchmarks Initiative, a Department of Defense funded effort (via interagency funds transfer to NSF). Allan Snavelly, PI, FY02-FY10, (\$1,605K).

Publications in HPC

1. Laurenzano, M., Tiwari, A., Cauble-Chantrenne, A., Jundt, A., Ward, W., Campbell, R., and Carrington, L. (2016) Characterization and Bottleneck Analysis of a 64-bit ARMv8 Platform. in *2016 IEEE International Symposium on Performance Analysis of Systems and Software*, Uppsala Sweden
2. Cicotti, P., and Carrington, L. (2016) ADAMANT: tools to capture, analyze, and manage data movement. in *International Conference on Computational Science*, San Diego, CA
3. Balaprakash, P., Tiwari, A., Wild, S., Carrington, L., and Hovland, P. (2016) AutoMOMML: Automatic Multi-Objective Modeling with Machine Learning. in *International Supercomputing*, Frankfurt, Germany
4. Tiwari, A., Schulz, M., and Carrington, L. (2015) Predicting Optimal Power Allocation for CPU and DRAM Domains. in *Workshop on Parallel and Distributed Scientific and Engineering Computing*, India
5. Tiwari, A., Keipert, K., Jundt, A., Peraza, J., Leang, S., Laurenzano, M., Gordon, M., and Carrington, L. (2015) Performance and Energy Efficiency Analysis of 64-bit ARM Using GAMESS. in *Hardware-Software Co-Design for High Performance Computing (Co-HPC), 2015*, IEEE
6. Tiwari, A., Jundt, A., Ward, W., Campbell, R., and Carrington, L. (2015) Building Blocks for a System-wide Power and Thermal Management Framework. IEEE, International Conference on Parallel and Distributed Systems (ICPADS'15)
7. Peraza, J., Tiwari, A., Ward, W., Campbell, R., and Carrington, L. (2015) VecMeter: An Easy-to-use Tool to Analyze Vectorization in HPC Codes. in *IEEE CLUSTER*, Chicago, IL
8. Jundt, A., Tiwari, A., Ward, W., Campbell, R., and Carrington, L. (2015) Optimizing Codes on the Xeon Phi: A Case-study with LAMMPS. in *XSEDE Conference: Scientific Advancements Enabled by Enhanced Cyberinfrastructure*, ACM
9. Jundt, A., Cauble-Chantrenne, A., Tiwari, A., Peraza, J., Laurenzano, M., and Carrington, L. (2015) Compute Bottlenecks on the New 64-bit ARM. in *International Workshop on Energy Efficient Supercomputing*, ACM
10. Cicotti, P., Shantharam, M., and Carrington, L. (2015) Tuning Tasks, Granularity, and Scratchpad Size for Energy Efficiency. in *Hardware-Software Co-Design for High Performance Computing (Co-HPC), 2015*, IEEE
11. Cicotti, P., Shantharam, M., and Carrington, L. (2015) Reducing Communication in Parallel Graph Search Algorithms with Software Caches. *special issue on Data-Intensive High Performance Computing with the International Journal of High Performance Computing Applications (IJHPCA)*, 1-13
12. Tiwari, A., Laurenzano, M., Jundt, A., Ward, W., Campbell, R., and Carrington, L. (2014) Adaptive Model-driven Facility-wide Management of Energy

- Efficiency and Reliability. in *Workshop on Modeling and Simulation of Exascale Systems and Applications (MODSIM'14)*, Seattle, WA
13. Tiwari, A., Gamst, A., Laurenzano, M., Schulz, M., and Carrington, L. (2014) Modeling the Impact of Reduced Memory Bandwidth on HPC Applications. in *EuroPar14 nominated top 5 papers*
 14. Suresh, A., Cicotti, P., and Carrington, L. (2014) Evaluation of Emerging Memory Technologies for HPC, Data Intensive Applications. in *IEEE CLUSTER 2014*, Madrid, Spain
 15. Porter, L., Laurenzano, M., Tiwari, A., Jundt, A., Ward, W., Campbell, R., and Carrington, L. (2014) To SMT or not to SMT: Understanding the Impact of Simultaneous Multithreading in HPC. *ACM Transactions on Architecture and Code Optimization*
 16. Laurenzano, M., Tiwari, A., Jundt, A., Peraza, J., Ward, W., Campbell, R., and Carrington, L. (2014) Characterizing the Performance-Energy Tradeoff of Small ARM Cores in HPC Computation. in *EuroPar14*
 17. Cicotti, P., Tiwari, A., and Carrington, L. (2014) Efficient Speed (ES): Adaptive DVFS and Clock Modulation for Energy Efficiency. in *IEEE CLUSTER 2014*, Madrid, Spain
 18. Cicotti, P., Mniszewski, S., and Carrington, L. (2014) An Evaluation of Threaded Models for a Classical MD Proxy Application. in *Hardware-Software Co-Design for High Performance Computing (Co-HPC), 2014*, IEEE
 19. Cicotti, P., and Carrington, L. (2014) Using Caching to Reduce Communication in Graph Search Algorithms. in *International Workshop on Data-Intensive Scalable Computing Systems (DISCS-14)*
 20. Peraza, J., Tiwari, A., Laurenzano, M., Carrington, L., Ward, W., and Campbell, R. (2013) Understanding the Performance of Stencil Computations on Intel's Xeon Phi. in *Cluster Computing 2013*
 21. Peraza, J., Tiwari, A., Laurenzano, M., Carrington, L., and Snaveley, A. (2013) PMAc's Green Queue: A Framework for Selecting Energy Optimal DVFS Configurations in Large Scale MPI Applications. *Concurrency and Computation: Practice and Experience*
 22. Meswani, M., Carrington, L., Unat, D., Peraza, J., Snaveley, A., Baden, S., and Poole, S. (2013) Modeling and Predicting Application Performance on Hardware Accelerators. *International Journal of High Performance Computing Applications* **27**, 89-108
 23. Laurenzano, M., Peraza, J., Carrington, L., Tiwari, A., Ward, W., and Campbell, R. (2013) PEBIL: Binary Instrumentation for Practical Data-Intensive Program Analysis. *Cluster Computing Special Issue on Data-Intensive High Performance Computing*
 24. Laurenzano, M., Carrington, L., Tiwari, A., Peraza, J., Ward, W., and Campbell, R. (2013) Viewing Application/Machine Interactions through Computational Idioms. in *Workshop on Modeling and Simulation of Exascale Systems and Applications (MODSIM'13)*, Seattle, WA
 25. Cicotti, P., Carrington, L., and Chein, A. (2013) Towards Application-Specific Memory Reconfiguration for Energy Efficiency. in *First International Workshop on Energy Efficient Supercomputing (E2SC)*

26. Carrington, L., Laurenzano, M., and Tiwari, A. (2013) Characterizing Large-scale HPC Applications Through Trace Extrapolation. *Speical Issue Parallel Processing Letters*
27. Carrington, L., Laurenzano, M., and Tiwari, A. (2013) Inferring Large-scale Computation Behavior via Trace Extrapolation. in *Large-Scale Parallel Processing workshop as part of IPDPS'13*, Boston, MA
28. Breslow, A. D., Tiwari, A., Schulz, M., Carrington, L., Tang, L., and Mars, J. (2013) Enabling fair pricing on HPC systems with node sharing. in *Proceedings of SC13: International Conference for High Performance Computing, Networking, Storage and Analysis*, ACM
29. Breslow, A., Porter, L., Tiwari, A., Laurenzano, M., Carrington, L., Tullsen, D., and Snaveley, A. (2013) The Case for Colocation of HPC Workloads. *Concurrency and Computation: Practice and Experience*
30. Tiwari, A., Laurenzano, M., Peraza, J., Carrington, L., and Snaveley, A. (2012) Green Queue: Customized Large-scale Clock Frequency Scaling. *Cloud and Green Computing 2012*
31. Tiwari, A., Laurenzano, M., Carrington, L., and Snaveley, A. (2012) Modeling Power and Energy Usage of HPC Kernels. *High Performance Power-Aware Computing (HPPAC12)*
32. Seager, K., Tiwari, A., Laurenzano, M., Peraza, J., Cicotti, P., and Carrington, L. (2012) Efficient HPC Data Motion via Scratchpad Memory. *International Workshop on Data-Intensive Scalable Computing Systems (DISCS-12)*
33. Meswani, M., Carrington, L., Unat, D., Snaveley, A., Baden, S., and Poole, S. (2012) Modeling and Predicting Performance of High Performance Computing Applications on Hardware Accelerators. *Proc. of the 2nd Int'l Workshop on Accelerators and Heterogenous Exascale Systems (AsHES 2012)*
34. Meswani, M., Carrington, L., Snaveley, A., and Poole, S. (2012) Tools for Benchmarking, Tracing, and Simulating SHMEM Applications. *Cray User Group Conference*
35. Laurenzano, M., Peraza, J., Carrington, L., Tiwari, A., Ward, W., and Campbell, R. (2012) A Static Binary Instrumentation Threading Model for Fast Memory Trace Collection. *submitted to International Workshop on Data-Intensive Scalable Computing Systems (DISCS-12)*
36. Tiwari, A., Laurenzano, M., Carrington, L., and Snaveley, A. (2011) Auto-tuning for Energy Usage in Scientific Applications. in *Proceedings of Workshop on Productivity and Performance (PROPER 2011)*, Bordeaux, France
37. Mills, C., Snaveley, A., and Carrington, L. (2011) A tool for characterizing and succinctly representing the data access patterns of applications. *IEEE International Symposium on Workload Characterization (IISWC)*, 126-135
38. Meswani, M., Carrington, L., Unat, D., Peraza, J., Snaveley, A., Baden, S., and Poole, S. (2011) Modeling and Predicting Application Performance on Hardware Accelerators. in *IEEE International Symposium on Workload Characterization (IISWC-2011)*, Austin, TX
39. Laurenzano, M., Meswani, M., Carrington, L., Snaveley, A., Tikir, M., and Poole, S. (2011) Reducing Energy Usage with Memory and Computation-Aware Dynamic Frequency Scaling. in *Euro-Par 2011*, France

40. Carrington, L., Tikir, M., Olschanowsky, C., Laurenzano, M., Peraza, J., Snaveley, A., and Poole, S. (2011) An Idiom-finding Tool for Increasing Productivity of Accelerators. in *25th International Conference on Supercomputing (ICS 2011)*, Tucson, AZ
41. Carrington, L., Ffrench, P., Hawkins, R., and Snaveley, A. (2011) Performance Estimation of HPCMP Applications on General Purpose Graphics Processing Units (GPGPUs). in *UGC2011*, Portland, OR
42. Olschanowsky, C., Meswani, M., Carrington, L., and Snaveley, A. (2010) PIR: A Static Idiom Recognizer. *First International Workshop on Parallel Software Tools and Tool Infrastructures (PSTI 2010)*
43. Olschanowsky, C., Carrington, L., Tikir, M., Laurenzano, M., Rosing, T., and Snaveley, A. (2010) Fine-grained Energy Consumption Characterization and Modeling. in *DoD HPCMP User Group Conference*, Chicago, IL
44. Meswani, M. R., Laurenzano, M. A., Carrington, L., and Snaveley, A. (2010) Modeling and Predicting Disk I/O Time of HPC Applications. *High Performance Computing Modernization Program Users Group Conference (HPCMP-UGC), 2010 DoD*, 478-486
45. Laurenzano, M., Tikir, M., Carrington, L., and Snaveley, A. (2010) PEBIL: Efficient Static Binary Instrumentation for Linux. in *IEEE International Symposium on Performance Analysis of Systems and Software (ISPASS)*, White Plains, NY
46. Bailey, D., Lucas, B., Williams, S., Carrington, L., and Snaveley, A. (eds). (2010) *Performance Tuning of Scientific Applications (Chapter 1: Performance Modeling: Understanding the Present and Pre-dicting the Future)*, CRC Press, Boca Raton, FL
47. Wright, N., Carrington, L., Tikir, M., Laurenzano, M., and Snaveley, A. (2009) Understanding and Achieving Good Performance on TeraGrid Resources: From Simple Performance Monitoring to Sophisticated Performance Models. in *TeraGrid*, Arlington, VA
48. Tikir, M., Laurenzano, M., Carrington, L., and Snaveley, A. (2009) PSINS: An Open Source Event Tracer and Execution Simulator for model prediction. in *HPCMP User Group Conference*, San Diego, CA
49. Tikir, M., Laurenzano, M., Carrington, L., and Snaveley, A. (2009) PSINS: An Open Source Event Tracer and Execution Simulator for MPI Applications. in *Euro-Par*, Delft, The Netherlands
50. Olschanowsky, C., Tikir, M., Carrington, L., and Snaveley, A. (2009) PSnAP: Accurate Synthetic Address Streams Through Memory Profiles. *The 22nd International Workshop on Languages and Compilers for Parallel Computing*
51. Komatitsch, D., Carrington, L., Laurenzano, M., Tikir, M., Michea, D., Le Goff, N., Snaveley, A., and Tromp, J. (2009) High-frequency simulation of seismic wave propagation in the whole Earth on 150,000 processor cores of a petaflop machine. in *Waves*, Pau, France
52. De Supinski, B., Alam, S., Bailey, D., Carrington, L., Daley, C., Dubey, A., Gamblin, T., Gunter, D., Hovland, P., Jagode, H., Karavanic, K., Marin, G., Mellor-Crummey, J., Moore, S., Norris, B., Oliker, L., Olschanowsky, C., Roth, P., Schulz, M., Shende, S., Snaveley, A., Spear, W., Tikir, M., Vetter, J., Worley,

- P., and Wright, N. (2009) Modeling the office of Science Ten Year Facilities Plan: The PERI Architecture Tiger Team. *Journal of Physics: Conference Series - Proceedings of the 2009 SciDAC Conference, June 14-18*
53. Dongarra, J., Graybill, R., Harrod, W., Lucas, R., Lusk, E., Luszczek, P., McMahon, J., Snavey, A., Vetter, J., Yelick, K., Alam, S., Campbell, R., Carrington, L., Chen, T. Y., Khalili, O., Meredith, J., and Tikir, M. (2008) DARPA's HPCS Program - History, Models, Tools, Languages. *Advances in Computers* **72**, 1-100
 54. Chen, T. Y., Khalili, O., Campbell, R., Carrington, L., Tikir, M., and Snavey, A. (2008) Performance Prediction and Ranking of Supercomputers. *Advances in Computers* **72**, 135-172
 55. Carrington, L., Komatitsch, D., Laurenzano, M., Tikir, M., Michéa, D., Le Goff, N., Snavey, A., and Tromp, J. (2008) High-frequency simulations of global seismic wave propagation using SPECSEM3D_GLOBE on 62K processors. in *Proceedings of the 2008 ACM/IEEE conference on Supercomputing*, IEEE Press, Austin, Texas
 56. Tikir, M., Carrington, L., Snavey, A., and Strohmaier, E. (2007) Genetic Algorithm Approach to Modeling the Performance of Memory-bound Codes. *The Proceeding of the ACM/IEEE Conference on High Performance Networking and Computing*
 57. Chen, T., Gunn, M., Simon, B., Carrington, L., and Snavey, A. (2007) Metrics for Ranking the Performance of Supercomputers. *Cyberinfrastructure Technology Watch Journal: Special Issue on High Productivity Computer systems* **2**
 58. Tikir, M., Laurenzano, M., Carrington, L., and Snavey, A. (2006) The PMAc Binary Instrumentation Library for PowerPC. *Workshop on Binary Instrumentation and Applications, San Jose*
 59. Carrington, L., Snavey, A., and Wolter, N. (2006) A performance prediction framework for scientific applications. *Future Generation Computer Systems* **22**, 336-346
 60. Worley, P., Candy, J., Carrington, L., Huck, K., Kaiser, T., Mahinthakumar, G., Maloney, A., Moore, S., Reed, D., Roth, P., Shan, H., Shende, S., Snavey, A., Sreepathi, S., Wolf, F., and Zhang, Y. (2005) Performance Analysis of GYRO: A Tool Evaluation. *Journal of Physics: Conference Series* **16**, 551-555
 61. Carrington, L., Laurenzano, M., A.Snavey, Campbell, R., and Davis, L. (2005) How well can simple metrics represent the performance of HPC applications? *Proceedings of the ACM/IEEE SC2005 Conference on High Performance Networking and Computing*
 62. Carrington, L., Gao, X., Wolter, N., Snavey, A., and Campbell, R. (2005) Performance Sensitivity Studies for Strategic Applications. *Department of Defense Users Group Conference 2005*
 63. Carrington, L., Gao, X., Snavey, A., and Campbell, R. (2005) Profile of AVUS Based on Sampled Memory Tracing of Basic Blocks. *Department of Defense Users Group Conference 2005*
 64. Snavey, A., Gao, X., Lee, C., Carrington, L., Wolter, N., Labarta, J., Gimenez, J., and Jones, P. (2004) Performance Modeling of HPC Applications. *Advances in Parallel Computing*

65. Lee, C., Snaveley, A., Leary, B., Carrington, L., Casanova, H., Bohn, R., Carson, R., Hardy, J., and Y.Schwartzman. (2004) Towards High-Order Performance Objectives for HPC System Scheduling. Technical Report San Diego Supercomputer Center
66. Carrington, L., Wolter, N., Snaveley, A., and Lee, C. (2004) Applying an Automated Framework to Produce Accurate Blind Performance Predictions of Full-Scale HPC Applications. *UGC*
67. Carrington, L., Snaveley, A., Gao, X., and Wolter, N. (2003) A Performance Prediction Framework for Scientific Applications. in *ICCS Workshop on Performance Modeling and Analysis (PMA03) Melbourne*
68. Snaveley, A., Carrington, L., Wolter, N., Labarta, J., Badia, R., and Purkayastha, A. (2002) A Framework for Application Performance Modeling and Prediction. *ACM/IEEE Conference on High Performance Networking and Computing*
69. Carrington, L., Wolter, N., and Snaveley, A. (2002) A Framework for Application Performance Prediction to Enable Scalability Understanding. *Scaling to New Heights Workshop, Pittsburgh*
70. Snaveley, A., Carrington, L., and Wolter, N. (2001) Modeling Application Performance by Convolving Machine Signatures with Application Profiles. in *IEEE Workshop on Workload Characterization, Austin*

Publications in Chemical Engineering

71. Nett-Carrington, L., and Herz, R. (2002) Spatiotemporal patterns within a porous catalyst: dynamic carbon monoxide oxidation in a single-pellet reactor. *Chemical Engineering Science* **57**, 1459-1474
72. Carrington, L. (2000) Modeling of Dynamic Carbon Monoxide Oxidation over a Porous Platinum Catalyst. *Ph.D. Dissertation*
73. Nett (Carrington), L., Cannestra, A., and Herz, R. (1997) Measurement of Gas Composition at the Center of a Porous Pellet during Adsorption and Catalytic Reaction under Dynamic Conditions. *Journal of Catalysis* **172**, 346-354

PROFESSIONAL ACTIVITIES

Invited presentations:

- **Keynote speaker** for 2nd International Workshop on Hardware-Software Co-Design for High Performance Computing (Co-HPC 2015), “Performance and Energy-efficiency Analysis of ARM Processor for HPC Workloads”, Austin, TX.
- ARM TECHCON 2014, Santa Clara, CA.
- Workshop on Modeling Frameworks for Heterogeneous High Performance Computing platforms, Washington, DC.
- **Keynote speaker** for 11th IASTED International Conference on Parallel and Distributed Computing and Networks 2013, Innsbruck, Austria
- SIAM 2013 minisymposium on Challenges of Energy-aware Scientific Computing.
- International Supercomputing Conference (ISC) 2013 Energy-efficiency in HPC.
- Supercomputing (SC) 2013 Experiencing HPC for Undergraduates.

- **Keynote speaker** for Supercomputing 2012 workshop on Extreme-Scale Performance Tools, Salt Lake City, Utah
- Exascale Research Conference 2012 session on Performance Modeling and Metrics.

Program Committees:

- **Global Chair** Performance and Power Modeling, Prediction and Evaluation for 22nd International European Conference on Parallel and Distributed Computing (Euro-Par 2016), Grenoble, France.
- Organizing Committee for Modeling and Simulation Workshop (MODSIM) 2013-2016, Seattle, WA.
- Technical Program Committee International Conference for High Performance Computing, Networking, Storage and Analysis (SC16), Salt Lake City, UT.
- Technical Program Committee 30th IEEE International Parallel & Distributed Processing Symposium (IPDPS2016), Chicago, IL.
- Technical Program Committee 24th High Performance Computing Symposium (HPC2016), Pasadena, CA.
- Technical Program Committee Second International Workshop on Performance Modeling: Methods and Applications (PMMA16), Frankfurt, Germany.
- Technical Program Committee International Symposium on Cluster, Cloud and Grid Computing (CCGrid) 2014-2016.
- Technical Committee in Programming Systems Area for Supercomputing (SC) 2015, Austin, TX.
- Technical Program Committee for workshop on Large-Scale Parallel Processing (LSPP'15) in association with IPDPS'15, Hyderabad, India.
- **Program co-Chair** for workshop on Energy Efficiency for Supercomputing (E2SC'15) in association with Supercomputing 2015, Austin, TX.
- **Organizer** and Technical Program Committee for Second International Workshop on Hardware-Software Co-design for High Performance Computing 2015, Co-HPC15, Austin, TX.
- Technical Program Committee member of the Workshop on High-Performance, Power-Aware Computing (HPPAC'15) Hyderabad, India.
- Technical Program Committee Cluster Computing 2015, Chicago, IL.
- Technical Program Committee Euro-Par 2015, Vienna, Austria.
- Co-Chair Performance Area for Program Committee for Supercomputing 2014.
- Program Committee ACM International Conference on Supercomputing 2014.
- Program Committee IEEE Cluster 2014-2015.
- Program Committee First International Workshop on Hardware-Software Co-Design for High Performance Computing (Co-HPC) 2014.
- ASCAC sub-committee on Advanced Technologies for Exascale Computing 2013.
- Program Committee for workshop on Energy Efficiency for Supercomputing (E2SC) in association with Supercomputing 2013-2014.
- Program Committee for workshop on Large-Scale Parallel Processing in association with IPDPS'13-14.
- Program Committee of OpenSHMEM 2013.

- Advisory Chair member of the International Conference on Advanced Communication and Computation (INFOCOMP 2011-2014).
- Technical Program Committee member of the Workshop on High-Performance, Power-Aware Computing (HPPAC'12-HPPAC'14).
- Technical Program Committee member of power-aware systems and architectures (PASA'12).
- Technical Program Committee member of the International Conference on High Performance Computing and Communications 2006.

Review/Advisory Panels:

- IDC Technical Computing Advisory Panel (2013-2014).
- NSF Review panel, CISE (Washington DC, May 2015, Oct. 2014, Feb. 2011 & Mar. 2008).
- DoE ASCR Panel (Washington DC, Mar. 2014, Jan. 2013, Dec. 2012, Nov. 2011 & Oct. 2009).
- DoD's Distributed Centers High Performance Computing Modernization Program Technical Evaluation Panel (Washington DC, 2000-2003).

Journal Reviewer:

- Parallel Computing
- Journal of Parallel and Distributed Computing
- Transactions on Parallel and Distributed Systems
- ACM Transactions on Modeling and Performance Evaluation of Computing Systems
- Editor: Special Issue of the International Journal of Supercomputing Applications on Hardware-software Co-Design for High Performance Computing

HONORS AND AWARDS

John C. Jubin '38-ARCO Scholar	UCSD Certificate for Exceptional Teaching Assistant
UCSD Regent's Fellowship	UCSD Certificate for Outstanding Teaching Assistant
AASERT-AMES Fellowship	RPI Dean's List of Distinguished Students: '88-'92
Patrisha Harris Fellowship	Olympia: Rensselaer's Athletic Honorary Society
Rensselaer Scholar	Phi Lambda Upsilon Honorary Chemical Society
Rensselaer's H&SS Honors Program	RPI Pi Society (3.14 GPA or greater)
Rensselaer's Honorary Physics Award	Top 15 offensive players in ICAC Women's Soccer