

# Paul R. Brenner, PhD, PE

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## CURRENT RESEARCH

- Transformative technologies for energy efficiency in high performance computing and data center operation
- Novel utilization of autonomous and heterogeneous resources for high performance computational science
- Accelerated parallel sampling algorithms for Monte Carlo based simulation methods

## RESEARCH, ENGINEERING, AND MANAGEMENT EXPERIENCE

- Center for Research Computing, The University of Notre Dame, Indiana 2007 - Present  
High Performance Computing Scientist
- Advance computation based research through HPC system design, deployment, operation, and support
  - Conduct HPC research and grant development to grow computational infrastructure and capabilities
  - HPC user training: hands-on instruction, collaborative wiki documentation, & operational communications
- U.S. Air Force Reserves, Engineering Officer (Traditional Reservist) 1998 - Present  
434<sup>th</sup> Air Wing Civil Engineering Squadron, Grissom ARB, Indiana 2009 - Present  
Engineering Squadron Commander
- Command 145 USAF engineers and technicians to meet operational, training, and mobility taskings
- U.S. DoD MSRC High Performance Computing Center, Wright Patterson AFB, Ohio 2005 - Present  
HPC Infrastructure Planning and Design Consultant
- Research and evaluate developing HPC technologies with respect to multi megawatt infrastructure impacts
- 445<sup>th</sup> Air Wing Civil Engineering Squadron, Wright Patterson AFB, Ohio 1998 - 2009  
Engineering, Mobility, & Training Officer
- Directed teams in project analysis, design, & execution; OIC of Operations (\$85million) Bagram, Afghanistan
- McGill AirClean Corporation, Columbus, Ohio 2000 - 2003  
Manager Civil/Structural Engineering
- Managed structural engineers, designers, and manufacturing planners for efficient project completion

## TEACHING EXPERIENCE

- University of Notre Dame, Notre Dame, IN 2003 – Present  
Concurrent Assistant Professor (2007 – 2008), Graduate Research Assistant (2003 – 2007)  
Instructor – Data Structures, Undergraduate Research, CSE Service Learning (CBR)
- Columbus State Community College, Columbus, Ohio 2001 - 2003  
Adjunct Faculty – Core Physics Sequence

## EDUCATION

- University of Notre Dame, Notre Dame, IN 2007  
Ph.D. Computer Science and Engineering  
Field of Research: Computational Biophysics and High Throughput Distributed Systems
- The Ohio State University, Columbus, OH 2000  
M.S. Materials Science and Engineering  
Field of Research: Intermetallic Mechanical Behavior and Dislocation Mechanisms
- University of Notre Dame, Notre Dame, IN 1998  
B.S. Civil Engineering – Cum Laude

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## PROFESSIONAL CERTIFICATION/ORGANIZATIONS

Registered Professional Engineer, Ohio

Member - Association for Computing Machinery (ACM)

Member - American Society of Heating, Refrigerating, and Air-Conditioning Engineers (ASHRAE)

## RECENT AWARDS

Uptime Institute – IT Lean, Clean, & Green Symposium, Green Enterprise IT Awardee 2009  
• Paper: “Grid Heating Clusters: Transforming Cooling Constraints into Thermal Benefits”  
Notre Dame Rev. William A. Toohy Award for Service and Social Justice 2008  
Notre Dame CSC Ganey Research Grant Recipient 2006  
National Engineering Week – New Faces in Engineering Nominee 2004

## RECENT PUBLICATIONS

P. Brenner, D. Thain, D. Latimer  
Grid Heating Clusters: Transforming Cooling Constraints into Thermal Benefits  
Uptime Institute – IT Lean, Clean, & Green Symposium, Green Enterprise IT Awardee, 2009

P. Brenner, J. M. Wozniak, D. Thain, A. Striegel, J.W. Peng, and J. A. Izaguirre  
Biomolecular Commitor Probability Calculation Enabled by Processing in Network Storage  
Journal of Parallel Computing, 2008

P. Brenner, J. M. Wozniak, D. Thain, A. Striegel, and J. A. Izaguirre  
Biomolecular Path Sampling Enabled by Processing in Network Storage  
Sixth IEEE International Workshop on High-Performance Computational Biology, 2007

J. M. Wozniak, P. Brenner, D. Thain, A. Striegel, and J. A. Izaguirre  
Making the Best of a Bad Situation: Prioritized Storage Management in GEMS  
Journal of Future Generation Computer Systems, 2007

P. Brenner, C. R. Sweet, D. VonHandorf, and J. A. Izaguirre  
Accelerating the Replica Exchange Method Through an Efficient All-pairs Exchange  
Journal of Chemical Physics, 2007

J. M. Wozniak, P. Brenner, D. Thain, A. Striegel, and J. A. Izaguirre  
Access Control for a Replica Management Database  
Proc Workshop on Storage Security and Survivability, ACM, 2006

J. M. Wozniak, P. Brenner, D. Thain, A. Striegel, and J. A. Izaguirre  
Applying Feedback Control to a Replica Management System  
Proc. Southeastern Symposium on System Theory, IEEE Control Systems Society, 2006

D. Thain, S. Klous, J. Wozniak, P. Brenner, A. Striegel, J. Izaguirre  
Separating Abstractions from Resources in a Tactical Storage System  
Supercomputing, 2005

S. Hampton, P. Brenner, A. Wenger, S. Chatterjee, J. Izaguirre  
Biomolecular Sampling: Algorithms, Test Molecules, and Metrics  
Lecture Notes in Computational Science and Engineering, 2005

G. Madey, C. Freeland, P. Brenner  
A Service Learning Program for CSE Students  
35<sup>th</sup> ASEE/IEEE Frontiers in Education Conference Proceedings 2005