

Paul Milton Ricker

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Personal

U. S. citizen.

Education

Ph. D. Physics, University of Chicago.	1996
Advisor: Prof. Donald Q. Lamb, Dept. of Astronomy and Astrophysics	
Thesis: "Off-Center Collisions between Clusters of Galaxies"	
M. S. Physics, University of Chicago.	1993
B. S. Physics with Distinction and with Honors in Astronomy (Minor in Mathematics), Pennsylvania State University.	1991

Fellowships and Honors

Presidential Early Career Award for Scientists and Engineers (PECASE).	2002
U. S. Dept. of Energy Defense Programs Early Career Award.	2002
Gordon Bell Prize.	2000
NASA Graduate Student Researchers Program (GSRP) Fellowship, High Performance Computing and Communications Focus.	1994–1996
U. S. Dept. of Education GAANN Teaching Fellowship.	1991–1993
Phi Beta Kappa Honor Society.	1991
Sigma Pi Sigma Physics Honor Society.	1991
Phi Beta Kappa (Lambda of Pennsylvania) Senior Thesis Prize.	1990
National Science Foundation Fellowship, Research Experience for Undergraduates Program, Pennsylvania State University.	1990, 1991
Braddock Scholarship, Pennsylvania State University.	1987–1991

Positions Held

Assistant Professor, Department of Astronomy, University of Illinois and Research Scientist, National Center for Supercomputing Applications (NCSA).	2002–present
Research Scientist, Department of Astronomy and Astrophysics and Accelerated Strategic Computing Initiative (ASCI) Center for Astrophysical Thermonuclear Flashes, University of Chicago.	2001–2002
Research Associate, Department of Astronomy and Astrophysics and Accelerated Strategic Computing Initiative (ASCI) Center for Astrophysical Thermonuclear Flashes, University of Chicago.	1999–2001
Research Associate, Department of Astronomy and Virginia Institute for Theoretical Astrophysics (VITA), University of Virginia.	1996–1998
Graduate Research Assistant, Enrico Fermi Institute, University of Chicago.	1993–1996
Graduate Teaching Fellow, Department of Physics, University of Chicago.	1991–1993
Research Assistant, Applied Research Laboratory, Pennsylvania State University.	1988–1989

Visiting and Adjunct Positions

Visiting Scientist, Mathematics and Computer Science Division, Argonne National Laboratory.	1999–2003
Associate Professor, Department of Chemistry, Physics, and Astronomy, Indiana University Northwest.	1996

Professional Societies

American Astronomical Society (Division: High Energy Astrophysics)
American Physical Society (Divisions: Astrophysics, Computational Physics)
Society for Industrial and Applied Mathematics
Sigma Xi

Grants as Principal Investigator

- National Science Foundation, Office of Cyberinfrastructure. “Multicore Optimization of an Astrophysical Simulation Code using Performance Annotations.” 2008-2009
\$85,000.
- Department of Energy, Los Alamos National Laboratory, Institute for Geophysics and Planetary Physics (IGPP). “Cosmological Hydrodynamics with Adaptive Mesh Refinement.” Co-PI with Salman Habib. \$102,000. 2004-2007
- Department of Energy, Lawrence Livermore National Laboratory. “Presidential Early Career Award for Scientists and Engineers (PECASE).” LLL B532720, \$250,000. 2003-2008

Fellowships as Principal Investigator or Advisor

- Hsiang-Yi Yang: NASA Earth and Space Sciences Graduate Fellowship (NESSF), 2008-2009
\$26,900 (first year of three)
- Paul M. Sutter: Department of Energy Computational Sciences Graduate Fellowship (CSGF), \$170,000 2007-2010

Grants as Co-Investigator

- Department of Energy, Los Alamos National Laboratory, Laboratory Directed Research and Development - Directed Research (LDRD-DR) Program. “Dark Energy and the Cosmic Web.” PI: Katrin Heitmann. 20070005DR, \$3,900,000. 2007-2010
- National Aeronautics and Space Administration, XMM AO-5. “A Systematic Study of Fossil Groups.” PI: Christopher Miller. NNX06AG57G, \$99,066. 2006-2007
- National Aeronautics and Space Administration, Earth and Space Sciences Project. “Development of an Interoperability-Based Environment for Adaptive Meshes (IBEAM) with Application to Radiation-Hydrodynamic Models of Gamma-Ray Bursts.” PI: Paul Saylor. CAN-00-OES-026, \$1,800,000. 2001-2004
- National Aeronautics and Space Administration, Chandra AO-2. “Merger Shocks in Clusters of Galaxies.” PI: Craig Sarazin. CXC GO1-2123X, \$59,885. 2001-2002
- National Aeronautics and Space Administration, XMM AO-1. “Merger Shocks in Clusters of Galaxies.” PI: Craig Sarazin. NAG5-10075, \$38,700. 2000-2002

National Aeronautics and Space Administration, Chandra AO-1. “Subcluster Mergers, Radio Relics, and the Cooling Flow in Abell 85.” PI: Craig Sarazin. CXC GO0-1173X, \$47,480. 2000-2001

Allocations as Principal Investigator

National Science Foundation, National Center for Supercomputing Applications (NCSA). “Studies in Common Envelope Evolution.” (TG-AST040034N) TACC Sun Constellation Cluster (250,000 service units). 2008

Department of Energy, National Center for Computational Sciences (NCCS), Oak Ridge National Laboratory. “Galaxy Cluster Radio Halos over Cosmic Time.” (AST010) NCCS Cray XT3/XT4 (500,000 service units). 2007

National Science Foundation, National Center for Supercomputing Applications (NCSA). “Effects of Nongravitational Physics on the Structure and Evolution of Galaxy Clusters.” (MCA05S029) NCSA SGI Altix (250,000 service units); NCSA Xeon Linux Supercluster (650,000 service units). 2005, 2007

National Science Foundation, National Center for Supercomputing Applications (NCSA). “Adaptive-Mesh Simulations of Large-Scale Structure Formation.” (AST030003) NCSA Xeon Linux Supercluster (62,000 service units). 2004

National Science Foundation, National Center for Supercomputing Applications (NCSA). “Adaptive-Mesh Simulations of Large-Scale Structure Formation.” (AST030003) NCSA Origin 2000 (64,000 service units); NCSA IA-32 cluster (10,000 service units). 2003

National Science Foundation, National Partnership for Advanced Computational Infrastructure (NPACI). “Merger-Driven Turbulence in Clusters of Galaxies.” UVA207. San Diego Cray T3E (40,000 service units). 1999–2000

National Science Foundation, Pittsburgh Supercomputing Center (PSC) and National Partnership for Advanced Computational Infrastructure (NPACI). “Cooling Flow Evolution in Clusters of Galaxies.” PSC AST970002P/NPACI UVA207. PSC Cray T3E (33,500 service units), Texas Cray T3E (9,000 service units), San Diego Cray T3E (11,000 service units). 1997–1999

Courses Taught

- ASTR 350, "Introduction to Cosmology" (undergraduate) University of Illinois at Urbana-Champaign. 2005, 7, 8
- ASTR 100, "Perspectives in Astronomy" (undergraduate) University of Illinois at Urbana-Champaign. 2003
- ASTR 496/596CAC, "Computational Astrophysics and Cosmology" (graduate) University of Illinois at Urbana-Champaign. 2003, 2006
- AST 200, "Introduction to Cosmology" (undergraduate) Indiana University Northwest. 1996

Public and Professional Service

“The Bullet Cluster 1E0657-56.” University of Illinois Astronomical Society talk, University of Illinois, Urbana, IL	2007
Astrophysics Data Program (ADP) peer review for NASA, Towson, MD	2006
Graduate program director, Astronomy Department, University of Illinois	2006–
Dark Energy Task Force white papers: “Dark Energy Studies: Challenges to Computational Cosmology.” Annis, J., et al. (astro-ph/0510194); “An X-ray Galaxy Cluster Survey for Investigations of Dark Energy.” Haiman, Z., et al. (astro-ph/0507013)	2005
Undergraduate academic advisor, Astronomy Department, University of Illinois	2004–
“The Formation of the Largest Objects in the Universe.” CTA Saturday Honors Astrophysics Lecture, University of Illinois, Urbana, IL	2004
“Simulating the Evolution of Clusters of Galaxies.” University of Illinois Astronomical Society talk, University of Illinois, Urbana, IL	2003
Chandra AO5 peer review for NASA, Boston, MA	2003
NCSA cyberinfrastructure software development: Teuthis simulation management tool	2002–
Referee for Developmental Allocation computer time proposals to NCSA	2004–
Peer reviewer for Astrophysical Journal, Astrophysical Journal Letters, Monthly Notices of the Royal Astronomical Society, Astronomy & Astrophysics, Physics of Fluids, Nature, Computing in Science and Engineering	2001–
Co-developer and code architect, ASCI FLASH hydrodynamics code	1999–

Publications

Refereed journal articles

- Yang, H.-Y., **Ricker, P. M.**, and Sutter, P. M. “The Influence of Concentration and Dynamical State on Scatter in the Galaxy Cluster Mass-Temperature Relation.” 2008, ApJ, submitted (arXiv:0808.4099)
- ZuHone, J. A., **Ricker, P. M.**, Lamb, D. Q., and Yang, H.-Y. “A Line-of-Sight Galaxy Cluster Collision: Simulated X-Ray Observations.” 2008, ApJ, submitted (arXiv:0808.0930)
- Heitmann, K., Lukić, Z., Fasel, P., Habib, S., Warren, M. S., White, M., Ahrens, J., Ankeny, L., Armstrong, R., O’Shea, B., **Ricker, P. M.**, Springel, V., Stadel, J., and Trac, H. “The Cosmic Code Comparison Project.” 2008, Comp. Sci. Disc., accepted (arXiv:0706.1270)
- Sutter, P. M. and **Ricker, P. M.** “Detecting Dark Matter-Dark Energy Coupling with the Halo Mass Function.” 2008, ApJ, accepted (arXiv:0804.4172)
- Voevodkin, A., Miller, C. J., Borozdin, K., Heitmann, K., Habib, S., **Ricker, P.**, and Nichol, R. C. “X-Ray Observations of Optically Selected Giant Elliptical-Dominated Galaxy Groups.” 2008, ApJ, accepted (arXiv:0803.3786)
- Wik, D. R., Sarazin, C. L., **Ricker, P. M.**, and Randall, S. W. “The Effect of Galaxy Cluster Mergers on Cosmological Parameter Estimation from Surveys of the Sunyaev-Zel’dovich Effect.” 2008, ApJ, 680, 17
- Ricker, P. M.** “A Direct Multigrid Poisson Solver for Oct-Tree Adaptive Meshes.” 2008, ApJS, 176, 293
- Sutter, P. M. and **Ricker, P. M.** “Structure and Evolution of Zel’dovich Pancakes as Probes of Dark Energy Models.” 2008, ApJ, 674, 1
- Ricker, P. M.** and Taam, R. E. “The Interaction of Stellar Objects within a Common Envelope.” 2008, ApJ, 672, L41
- Lukić, Z., Heitmann, K., Habib, S., Bashinsky, S., and **Ricker, P. M.** “The Halo Mass Function: High Redshift Evolution and Universality.” 2007, ApJ, 671, 1160
- Heitmann, K., Lukić, Z., Habib, S., and **Ricker, P. M.** “Capturing Halos at High Redshifts.” 2006, ApJ, 642, L85
- Heitmann, K., **Ricker, P. M.**, Warren, M. S., and Habib, S. “Robustness of Cosmological Simulations I: Large Scale Structure.” 2005, ApJS, 160, 28
- Brown, E. F., Calder, A. C., Plewa, T., **Ricker, P. M.**, Robinson, K., and Gallagher, J. B. “Type Ia Supernovae: Simulations and Nucleosynthesis.” 2005, Nuc. Phys. A, 758, 451
- Gardini, A. and **Ricker, P. M.** “Simulations of Hot Bubbles in the ICM.” 2004, MPLA, 19, 2317

- Calder, A., Dursi, J., Fryxell, B., Plewa, T., Weirs, G., DuPont, T., Robey, H., Kane, J., Remington, B., Timmes, F., Dimonte, G., Hayes, J., Zingale, M., Drake, P., **Ricker, P.**, Stone, J., and Olson, K. "Validating Astrophysical Simulation Codes." 2004, *CiSE*, 6, 10
- Dimonte, G., Youngs, D. L., Dimitis, A., Weber, S., Marinak, M., Wunsch, S., Garasi, C., Robinson, A., Andrews, M. J., Ramaprabhu, P., Calder, A. C., Fryxell, B., Biello, J., Dursi, L., MacNeice, P., Olson, K., **Ricker, P.**, Rosner, R., Timmes, F., Tufo, H., Young, Y.-N., and Zingale, M. "A Comparative Study of the Turbulent Rayleigh-Taylor Instability using High-Resolution Three-Dimensional Numerical Simulations: The Alpha-Group Collaboration." 2004, *Phys. Fluids*, 16, 1668
- Alexakis, A., Calder, A. C., Heger, A., Brown, E. F., Dursi, L. J., Truran, J. W., Rosner, R., Lamb, D. Q., Timmes, F. X., Fryxell, B., Zingale, M., **Ricker, P. M.**, and Olson, K. "On Heavy Element Enrichment in Classical Novae." 2004, *ApJ*, 602, 931
- Robinson, K., Dursi, L. J., **Ricker, P. M.**, Rosner, R., Linde, T., Zingale, M., Calder, A. C., Fryxell, B., Truran, J. W., Caceres, A., Olson, K., Riley, K., Siegel, A., and Vladimirova, N. "Morphology of Rising Hydrodynamic and Magnetohydrodynamic Bubbles from Numerical Simulations." 2004, *ApJ*, 601, 621
- Dursi, L. J., Zingale, M., Calder, A. C., Fryxell, B., Timmes, F. X., Vladimirova, N., Rosner, R., Caceres, A., Lamb, D. Q., Olson, K., **Ricker, P. M.**, Riley, K., Siegel, A., and Truran, J. W. "The Response of Model and Astrophysical Thermonuclear Flames to Curvature and Stretch." 2003, *ApJ*, 595, 955
- Kempner, J. C., Sarazin, C. L., and **Ricker, P. M.** "*Chandra* Observations of Abell 85: Merger of the South Subcluster." 2002, *ApJ*, 579, 236
- Randall, S. W., Sarazin, C. L., and **Ricker, P. M.** "The Effect of Merger Boosts on the Luminosity, Temperature, and Inferred Mass Functions of Clusters of Galaxies." 2002, *ApJ*, 577, 579
- Zingale, M., Dursi, L. J., ZuHone, J., Calder, A. C., Fryxell, B., Plewa, T., Truran, J. W., Caceres, A., Olson, K., **Ricker, P. M.**, Riley, K., Rosner, R., Siegel, A., Timmes, F. X., and Vladimirova, N. "Mapping Initial Hydrostatic Models in Godunov Codes." 2002, *ApJS*, 143, 539
- Calder, A. C., Fryxell, B., Plewa, T., Rosner, R., Dupont, T., Kane, J. O., Robey, H. F., Remington, B. A., Drake, R. P., Dimonte, G., Zingale, M., Dursi, L. J., Timmes, F. X., Olson, K., **Ricker, P.**, MacNeice, P., and Tufo, H. M. "On Validating an Astrophysical Simulation Code." 2002, *ApJS*, 143, 201
- Ricker, P. M.** and Sarazin, C. L. "Off-Axis Cluster Mergers: Effects of a Strongly Peaked Dark Matter Profile." 2001, *ApJ*, 561, 621
- Zingale, M., Timmes, F. X., Fryxell, B., Lamb, D. Q., Olson, K., Calder, A. C., Dursi, L. J., **Ricker, P.**, Rosner, R., MacNeice, P., and Tufo, H. M. "Helium Detonations on Neutron Stars." 2001, *ApJS*, 133, 195

- Fryxell, B., Zingale, M., Timmes, F. X., Lamb, D. Q., Olson, K., Calder, A. C., Dursi, L. J., **Ricker, P.**, Rosner, R., Truran, J. W., MacNeice, P., and Tufo, H. “Numerical Simulations of Thermonuclear Flashes on Neutron Stars.” 2001, *Nuc. Phys. A*, 688, 172
- Timmes, F. X., Zingale, M., Olson, K., Fryxell, B., **Ricker, P.**, Calder, A. C., Dursi, L. J., Tufo, H., MacNeice, P., Truran, J. W., and Rosner, R. “On the Cellular Structure of Carbon Detonations.” 2000, *ApJ*, 543, 938
- Fryxell, B., Olson, K., **Ricker, P.**, Timmes, F. X., Zingale, M., Lamb, D. Q., MacNeice, P., Rosner, R., Truran, J. W., and Tufo, H. “FLASH: An Adaptive-Mesh Hydrodynamics Code for Modeling Astrophysical Thermonuclear Flashes.” 2000, *ApJS*, 131, 273
- Rosner, R., Calder, A., Dursi, J., Fryxell, B., Lamb, D. Q., Niemeyer, J. C., Olson, K., **Ricker, P.**, Timmes, F. X., Truran, J. W., Tufo, H., Young, Y.-N., Zingale, M., Lusk, E., and Stevens, R. “Flash Code: Studying Astrophysical Thermonuclear Flashes.” 2000, *CiSE*, 2, 33
- Ricker, P. M.**, Dodelson, S., and Lamb, D. Q. “COSMOS: A Hybrid N-Body/Hydrodynamics Code for Cosmological Problems.” 2000, *ApJ*, 536, 122
- Ricker, P. M.** “Off-Center Collisions between Clusters of Galaxies.” 1998, *ApJ*, 496, 670
- Ricker, P. M.** and Meszaros, P. “Starburst and Reflection-Dominated AGN Contributions to the Cosmic X-Ray Background.” 1993, *ApJ*, 418, 49

Conference proceedings

- Taam, R. E. and **Ricker, P. M.** “Common Envelope Evolution.” 2005, in “A Life with Stars: A Meeting in Honor of Ed van den Heuvel,” August 22-26, 2005, Amsterdam, Netherlands, to appear
- Ricker, P. M.**, Robinson, K., Dursi, L. J., Rosner, R., Calder, A. C., Zingale, M., Truran, J. W., Linde, T., Caceres, A., Fryxell, B., Olson, K., Riley, K., Siegel, A., and Vladimirova, N. “Simulations of Rising Hydrodynamic and Magnetohydrodynamic Bubbles.” 2003, in *The Riddle of Cooling Flows in Galaxies and Clusters of Galaxies*, T. H. Reiprich, J. C. Kempner, and N. Soker, eds. (<http://www.astro.virginia.edu/coolflow>)
- Zingale, M., Woosley, S. E., Cumming, A., Calder, A., Dursi, L. J., Fryxell, B., Olson, K., **Ricker, P.**, Rosner, R., and Timmes, F. X. “Investigations of Pointwise Ignition of Helium Deflagrations on Neutron Stars.” 2002, in *Proc. 3D Stellar Evolution Workshop*, S. Turcotte, S. C. Keller, and R. M. Cavallo, eds. (San Francisco: Astronomical Society of the Pacific), 329
- Dursi, L. J., Calder, A. C., Alexakis, A., Truran, J. W., Rosner, R., Zingale, M., Fryxell, B., **Ricker, P. M.**, Timmes, F. X., and Olson, K. “Onset of Convection on a Pre-Runaway White Dwarf.” 2002, in *Proc. Intl. Conf. on Classical Nova Explosions*, M. Hernanz and J. José, eds. (Melville, NY: AIP Press), 139

- Calder, A. C., Alexakis, A., Dursi, L. J., Rosner, R., Truran, J. W., Fryxell, B., **Ricker, P.**, Zingale, M., Olson, K., Timmes, F. X., and MacNeice, P. "Mixing by Non-linear Gravity Wave Breaking on a White Dwarf Surface." 2002, in Proc. Intl. Conf. on Classical Nova Explosions, M. Hernanz and J. José, eds. (Melville, NY: AIP Press), 134
- Truran, J. W., Alexakis, A., Calder, A. C., Dursi, L. J., Zingale, M., Fryxell, B., **Ricker, P.**, Timmes, F. X., Olson, K., and Rosner, R. "Mixing by Wave Breaking at the Surface of a White Dwarf." 2002, in Proc. 11th Workshop on "Nuclear Astrophysics," W. Hillebrandt and E. Müller, eds. (Garching b. München, Germany: MPA/P13), 186
- Kempner, J. C., Sarazin, C. L., and **Ricker, P. M.** "Dynamics of the Multiple Merger Cluster of Galaxies Abell 85." 2002, in X-rays at Sharp Focus: Proceedings of the Chandra Science Symposium, S. Vrtilik, E. M. Schlegel, and L. Kuhi, eds. (San Francisco: Astronomical Society of the Pacific), 383
- Ricker, P. M.** and Sarazin, C. L. "Off-Axis Cluster Mergers." 2001, in Proceedings of the 20th Texas Symposium on Relativistic Astrophysics, J. C. Wheeler and H. Martel, eds. (Melville, NY: AIP Press), 152
- Calder, A. C., Fryxell, B., Rosner, R., Dursi, L. J., Olson, K., **Ricker, P. M.**, Timmes, F. X., Zingale, M., MacNeice, P., and Tufo, H. M. "Simulations of Astrophysical Fluid Instabilities." 2001, in Proceedings of the 20th Texas Symposium on Relativistic Astrophysics, J. C. Wheeler and H. Martel, eds. (Melville, NY: AIP Press), 484
- Zingale, M., Niemeyer, J. C., Timmes, F. X., Dursi, L. J., Calder, A. C., Fryxell, B., Lamb, D. Q., MacNeice, P., Olson, K., **Ricker, P. M.**, Rosner, R., Truran, J. W., and Tufo, H. M. "Quenching Processes in Flame-Vortex Interactions." 2001, in Proceedings of the 20th Texas Symposium on Relativistic Astrophysics, J. C. Wheeler and H. Martel, eds. (Melville, NY: AIP Press), 490
- Ricker, P. M.**, Calder, A. C., Dursi, L. J., Fryxell, B., Lamb, D. Q., MacNeice, P., Olson, K., Rosner, R., Timmes, F. X., Truran, J. W., Tufo, H. M., and Zingale, M. "Large-Scale Simulations of Clusters of Galaxies." 2001, in Proceedings of the VII International Workshop on Advanced Computing and Analysis Techniques in Physics Research (ACAT 2000), P. C. Bhat and M. Kasemann, eds. (Melville, NY: AIP Press), 316
- Calder, A. C., Curtis, B. C., Dursi, L. J., Fryxell, B., Henry, G., MacNeice, P., Olson, K., **Ricker, P.**, Rosner, R., Timmes, F. X., Tufo, H. M., Truran, J. W., and Zingale, M. "High-Performance Reactive Fluid Flow Simulations Using Adaptive Mesh Refinement on Thousands of Processors." 2000, Gordon Bell Prize winner, in Proc. Supercomputing 2000 (<http://www.sc2000.org>)
- Fryxell, B., Zingale, M., Timmes, F. X., Lamb, D. Q., Olson, K., Calder, A. C., Dursi, L. J., **Ricker, P.**, and Rosner, R. "Helium Detonations on Neutron Stars." 2000, in Proc. 10th Workshop on "Nuclear Astrophysics," W. Hillebrandt and E. Müller, eds. (Garching b. München, Germany: MPA/P12), 38

Ricker, P. M. and Meszaros, P. “Starburst and Reflection-Dominated AGN Contributions to the Diffuse X-Ray Background.” 1993, in Proceedings of the Compton Gamma-Ray Observatory Conference, M. Friedlander, N. Gehrels, and D. J. Macomb, eds. (NY: AIP Press), 593

Invited colloquia and conference talks

- “Galaxy Clusters: Hot, Wild, and Out of Equilibrium.” Invited review talk, Santa Fe Cosmology Workshop, July 2008, Santa Fe, NM
- “Galaxy Cluster Radio Halos over Cosmic Time.” Invited talk, Great Lakes Cosmology Workshop 9, June 2008, Carnegie-Mellon University, Pittsburgh, PA
- “Galaxy Clusters as Probes of Dark Energy.” ISR Colloquium, March 2008, Los Alamos National Laboratory, Los Alamos, NM
- “Sources of Scatter in Cluster Mass-Observable Relations.” ASIAA Colloquium, December 2007, Academia Sinica Institute for Astronomy and Astrophysics, Taipei, Taiwan
- “Galaxy Cluster Radio Halos over Cosmic Time.” TIARA Mini-Workshop on Numerical Simulations, December 2007, Academia Sinica Institute for Astronomy and Astrophysics, Taipei, Taiwan
- “Overview and Status of FLASH.” CFD Seminar, November 2007, Academia Sinica Institute for Astronomy and Astrophysics, Taipei, Taiwan
- “Galaxy Cluster Radio Halos over Cosmic Time.” Invited talk, Oak Ridge National Laboratory booth, Supercomputing 07, November 2007, Reno, NV
- “Poisson Solvers in FLASH: Facts and Fiction.” Review talk, Adaptive Mesh Simulations with FLASH, October 2007, Jacobs University, Bremen, Germany
- “Binary Star Evolution within Common Envelopes.” Theoretical Astrophysics Lunch Talk, October 2007, University of Illinois, Urbana, IL
- “FLASH: Overview and Status.” Invited talk, Durham Radiation Transfer Workshop, University of Durham, September 2007, Durham, UK
- “Sources of Scatter in Cluster Mass-Observable Relations.” Invited talk, Great Lakes Cosmology Workshop 8, Ohio State University, May 2007, Columbus, OH
- “Exascale Challenges Posed by Active Galaxy Feedback.” Invited talk, Simulation and Modeling at the Exascale for Energy, Ecological Sustainability, and Global Security (E3SGS) Town Hall Meeting, May 2007, Oak Ridge, TN
- “Scatter in Cluster Mass-Observable Relations.” Los Alamos Dark Universe Project group meeting, March 2007, Los Alamos, NM

- “Using Galaxy Cluster Simulations to Study Dark Energy.” Astrophysics seminar, University of Notre Dame, September 2006, South Bend, IN
- “Early Halo Formation in Cosmological N -Body Simulations.” Invited seminar, Program on the First Stars and Evolution of the Early Universe, June 2006, Institute for Nuclear Theory, University of Washington, Seattle, WA
- “High-Performance Computing Challenges in Numerical Cosmology.” Invited talk, NSF High-Performance Computing Town Hall Meeting, October 2005, Urbana, IL
- “Combining Particle-Mesh Methods with Adaptive Mesh Refinement for Cosmological Simulation.” Los Alamos Computer Science Institute Symposium talk, October 2005, Santa Fe, NM
- “Simulating the Structural Evolution of Galaxy Clusters.” Invited review talk, Santa Fe Cosmology Workshop, July 2005, Santa Fe, NM
- “Simulations of Merging Clusters of Galaxies.” Solicited review talk, 35th COSPAR Scientific Assembly, July 2004, Paris, France
- “Applying FLASH to Cosmological Problems” and “Adaptive-Mesh Simulations of Galaxy Cluster Formation.” Invited talks, Durham FLASH/AMR Cosmology Workshop, June 2004, University of Durham, Durham, UK
- “Galaxy Clusters and Cosmology.” Cosmology Day, April 2004, Los Alamos National Laboratory, Los Alamos, NM
- “Numerical Methods in Large-Scale Structure Simulation.” Electromagnetics Seminar, March 2004, Center for Computational Electromagnetics, University of Illinois, Urbana, IL
- “Simulating the Intracluster Medium.” V Division/IGPP Seminar, February 2004, Lawrence Livermore National Laboratory, Livermore, CA
- “Cosmological Constraints from Clusters of Galaxies.” Physics Department Colloquium, February 2004, University of Kansas, Lawrence, KS
- “Cosmological Constraints from Clusters of Galaxies.” High-Energy Physics Seminar, January 2004, University of Michigan, Ann Arbor, MI
- “Particle Simulation using the FLASH Code.” Invited talk, 2003 CFD-MHD Workshop in Astrophysics: Numerical Methods and Turbulence, Academia Sinica Institute for Astronomy and Astrophysics (ASIAA), December 2003, Taipei, Taiwan
- “Cosmological Constraints from Clusters of Galaxies.” Theoretical Astrophysics Lunch Talk, November 2003, University of Illinois, Urbana, IL
- “Implementing Particles in an Adaptive Mesh Refinement Hydrodynamics Code.” Los Alamos Computer Science Institute Symposium talk, October 2003, Santa Fe, NM

- “Hydrodynamical Simulation of Clusters of Galaxies.” Astrophysics Seminar, October 2003, Ohio University, Athens, OH
- “Cosmological Constraints from Clusters of Galaxies.” Santa Fe Cosmology Workshop, July 2003, Santa Fe, NM
- “The Dynamical Evolution of Clusters of Galaxies.” Astrophysics Seminar, April 2003, Northwestern University, Evanston, IL
- “The Thermal Physics of Galaxy Cluster Mergers.” Astrophysics Seminar, December 2002, Max Planck Institute for Astrophysics, Garching, Germany
- “The Formation of Globular Clusters.” Theoretical Astrophysics Lunch Talk, November 2002, University of Illinois, Urbana, IL
- “Mergers between Clusters of Galaxies.” Physics Department Colloquium, October 2002, University of Minnesota, Minneapolis, MN
- “Dynamical Effects of Mergers between Clusters of Galaxies.” Astronomy Department Colloquium, January 2002, University of Illinois, Urbana, IL
- “The Thermal Physics of Cluster Mergers.” Astrophysics Research Group Seminar, August 2001, Carnegie-Mellon University, Pittsburgh, PA
- “Cosmological Simulation using Adaptive Mesh Refinement.” Cosmological Physics Lunch Seminar, May 2001, University of Chicago, Chicago, IL
- “The Structure of Self-Gravitating Hydrodynamic Turbulence.” Tuesday UVa-NRAO Astronomy talk, February 2001, National Radio Astronomy Observatory, Charlottesville, VA
- “Numerical Simulations of Galaxy Cluster Mergers.” Astronomy Research Group Seminar, March 2000, Queens University, Kingston, ON
- “Numerical Simulations of Galaxy Cluster Mergers.” CITA Seminar, March 2000, Canadian Institute for Theoretical Astrophysics, Toronto, ON
- “Numerical Simulations of Galaxy Cluster Mergers.” Astronomy Department Colloquium, September 1999, University of Maryland, College Park, MD
- “The Origin of the X-ray Cluster Luminosity-Temperature Relationship.” Cluster Lunch talk, February 1999, University of Chicago, Chicago, IL
- “The Origin of the X-ray Cluster Luminosity-Temperature Relationship.” Tuesday UVa-NRAO Astronomy talk, December 1998, National Radio Astronomy Observatory, Charlottesville, VA
- “Cluster Mergers and Cooling Flow Evolution.” ASCI Flash Center Seminar, June 1998, University of Chicago, Chicago, IL

“Off-Center Collisions between Clusters of Galaxies.” Tuesday UVa-NRAO Astronomy talk,
December 1996, National Radio Astronomy Observatory, Charlottesville, VA

Invited lectures

“Computational Astrophysics.” Invited lecture series, 16th Chris Engelbrecht Summer School in
Computational Physics, January 2005, Alpine Heath Resort, Drakensberg,
KwaZulu-Natal, South Africa

“Gravity, Particles, and Cosmology with FLASH.” FLASH Tutorial talk, May 2004, University
of Chicago, Chicago, IL