

Alan Calder's Publication List

Refereed Publications

1. *Tera-scale Turbulence Computation on BG/L Using the FLASH3 Code.* R. Fisher, S. Abarzhi, K. Antypas, S. M. Asida, A. C. Calder, F. Cattaneo, P. Constantin, A. Dubey, I. Foster, J. B. Gallagher, M. K. Ganapathy, C.C. Glendenin, L. Kadanoff, D.Q. Lamb, S. Needham, M. Papka, T. Plewa, L.B. Reid, P. Rich, K. Riley, and D. Sheeler. in prep. to be submitted to the IBM Journal of Research and Development.
2. *Capturing the Fire 2: Hydrodynamic Character of a Multi-Stage Flame Front Model for Deflagrations of Carbon-Oxygen White Dwarfs.* D. Townsley, A. C. Calder, S. M. Asida, T. Jena, A. Zhiglo, I. Seitzzahl, F. Peng, A. Khokhlov, J. Truran, and D. Q. Lamb. in prep. to be submitted to the ApJ.
3. *Capturing the Fire: Flame Energetics and Neutronization for Type Ia Supernovae.* A. C. Calder, D. Townsley, O. E. B. Messer, I. Seitzzahl, F. Peng, E. F. Brown, N. Vlahimirova, J. Truran, and D. Q. Lamb. ApJ., in press. astro-ph/0611009
4. *The Late-Time Behavior of the Single-mode Rayleigh-Taylor Problem.* P. Ramaprabhu, G. Dimonte, A. C. Calder, and B. Fryxell, Phys. Rev. E., in press.
5. *Scientific Applications on the Massively Parallel BG/L Machine.* K. Antypas, A.C. Calder, A. Dubey, R. Fisher, M.K. Ganapathy, J.B. Gallagher, L.B. Reid, K. Riley, D. Sheeler, and N. Taylor, accepted to Parallel and Distributed Processing Techniques and Applications (PDPTA '06).
6. *Laboratory Astrophysics Experiments for Simulation Code Validation: A Case Study.* A. C. Calder, Ap&SS, **298**, 25, 2005.
7. *Type Ia Supernovae: Simulations and Nucleosynthesis.* E. F. Brown, A. C. Calder, T. Plewa, P. M. Ricker, K. Robinson, J. B. Gallagher. Nuclear Physics A, **758**, 451, 2005.
8. *Type Ia Supernova Explosion: Gravitationally Confined Detonation.* T. Plewa, A. C. Calder, and D. Q. Lamb. ApJ, **612**, L37, 2004.
9. *On the Nonlinear Evolution of Wind-driven Gravity Waves.* A. Alexakis, A. C. Calder, L. J. Dursi, R. Rosner. F. X. Timmes, B. Fryxell, M. Zingale, P. M. Ricker, and K. Olson. Phys. Fluids, **16**, No. 9, 3256, 2004.
10. *Validating Astrophysical Simulation Codes.* A. C. Calder, L. J. Dursi, B. Fryxell, T. Plewa, V. G. Weirs, T. Dupont, H. F. Robey, J. O. Kane, R. P. Drake, B. A. Remington, G. Dimonte, J. Hayes, J. M. Stone, P. M. Ricker, F. X. Timmes, M. Zingale, and K. Olson. CiSE **6** No. 5, 10, 2004
11. *A comparison of high-resolution 3D numerical simulations of turbulent Rayleigh-Taylor (RT) instability: Alpha-Group collaboration.* G. Dimonte, D. Youngs, A. Dimits, S. Weber, M. Marinak, S. Wunsch, C. Garasi, A. Robinson, M. J. Andrews, P. Ramaprabhu, A. C. Calder, B. Fryxell, J. Biello, L. Dursi, P. MacNeice, K. Olson, P. Ricker, R. Rosner, F. Timmes, H. Tufo, Y.-N. Young, and M. Zingale. Phys. Fluids, **16**, No. 5, 1668, 2004
12. *On Heavy Element Enrichment in Classical Novae.* A. Alexakis, A. C. Calder, A. Heger, E. F. Brown, L. J. Dursi, J. W. Truran. R. Rosner. D. Q. Lamb, F. X. Timmes, B. Fryxell, M. Zingale, P. M. Ricker, and K. Olson. ApJ, **602** 931, 2004

13. *Morphology of Rising Hydrodynamic and Magneto-hydrodynamic Bubbles from Numerical Simulations.* K. Robinson, L. J. Dursi, P. M. Ricker, R. Rosner, T. Linde, M. Zingale, A. C. Calder, B. Fryxell, J. W. Truran, F. X. Timmes, A. Caceres, K. Olson, K. Riley, A. Siegel, and N. Vladimirova. *ApJ*, **601** 621, 2004
14. *The Response of Model and Astrophysical Thermonuclear Flames to Curvature and Stretch.* L. J. Dursi, M. Zingale, A. C. Calder, B. Fryxell, F. X. Timmes, N. Vladimirova, R. Rosner, A. Caceres, D. Q. Lamb, K. Olson, P. M. Ricker, K. Riley, A. Siegel, and J. W. Truran. *ApJ*, **595** 955, 2003
15. *Mapping Hydrostatic Models in Godunov Codes.* M. Zingale, L. J. Dursi, J. ZuHone, A. C. Calder, B. Fryxell, T. Plewa, J. W. Truran, A. Caceres, K. Olson, P. M. Ricker, K. Riley, R. Rosner, A. Siegel, F. X. Timmes, and N. Vladimirova. *ApJS*, **143** 539, 2002
16. *On Validating an Astrophysical Simulation Code.* A. C. Calder, B. Fryxell, T. Plewa, R. Rosner, L. J. Dursi, V. G. Weirs, T. Dupont, H. F. Robey, J. O. Kane, B. A. Remington, R. P. Drake, G. Dimonte, M. Zingale, F. X. Timmes, K. Olson, P. Ricker, P. MacNeice, and H. M. Tufo. *ApJS*, **143** 201, 2002
17. *Numerical Models of Binary Neutron Star System Mergers II.: Coalescing Models with Post-Newtonian Radiation Reaction Forces.* A. C. Calder and E. Y. M. Wang. *ApJ*, **570** 303, 2002
18. *Interface Imprinting by a Rippled Shock Using an Intense Laser.* J. O. Kane, H. F. Robey B. A. Remington, R. P. Drake, J. Knauer, D. D. Ryutov, H. Louis, R. Teyssier, O. Hurricane, D. Arnett, R. Rosner, and A. Calder. *Phys. Rev. E*, **63**, 055401(R) 2001
19. *Numerical Simulations of Thermonuclear Flashes on Neutron Stars.* B. Fryxell, M. Zingale, F. X. Timmes, D. Q. Lamb, K. Olson, A. C. Calder, L. J. Dursi, P. Ricker, R. Rosner, J. W. Truran, P. MacNeice, and H. Tufo. *Nuclear Physics A*, **688** 172 2001
20. *Helium Detonations on Neutron Stars.* M. Zingale, J. W. Truran, F. X. Timmes, B. Fryxell, D. Q. Lamb, K. Olson, A. C. Calder, L. J. Dursi, P. Ricker, R. Rosner, P. MacNeice, and H. Tufo. *ApJ*, **133** 195, 2001
21. *High-Performance Reactive Fluid Flow Simulations Using Adaptive Mesh Refinement on Thousands of Processors.* A. C. Calder, B. C. Curtis L. J. Dursi, B. Fryxell, G. Henry, P. MacNeice, K. Olson, P. Ricker, R. Rosner, F. X. Timmes, J. W. Truran, H. M. Tufo, and M. Zingale. in *Proc. Supercomputing 2000*, IEEE Computer Soc. 2000, <http://sc2000.org> (Gordon Bell Prize)
22. *On The Cellular Structure of Carbon Detonations.* F. X. Timmes, M. Zingale, K. Olson, B. Fryxell, P. Ricker, A. C. Calder, L. J. Dursi, J. W. Truran, H. Tufo, P. MacNeice, and R. Rosner. *ApJ*, **543** 938, 2000
23. *Numerical Models of Binary Neutron Star System Mergers. I.: Numerical Methods and Equilibrium Data for Newtonian Models.* F. D. Swesty, E. Y. M. Wang, and A. C. Calder. *ApJ*, **541** 937, 2000
24. *Flash Code: Studying Astrophysical Thermonuclear Flashes.* R. Rosner, A. Calder, J. Dursi, B. Fryxell, D. Q. Lamb, J. C. Niemeyer, K. Olson, P. Ricker, F. X. Timmes, J. W. Truran, H. Tufo, Y-N Young, M. Zingale, Ewing Lusk, and Rick Stevens. *CiSE*, **2** No. 2, 33, 2000
25. *An Investigation of Neutrino-Driven Convection and the Core Collapse Supernovae Mechanism Using Multigroup Neutrino Transport.* A. Mezzacappa, A. C. Calder, S. W. Bruenn, J. M. Blondin, M. W. Guidry, M. R. Strayer, and A. S. Umar. *ApJ*, **495** 911, 1998

26. *The Interplay Between Protoneutron Star Convection and Neutrino Transport in Core Collapse Supernovae.* A. Mezzacappa, A. C. Calder, S. W. Bruenn, J. M. Blondin, M. W. Guidry, M. R. Strayer, and A. S. Umar. *ApJ*, **493** 848, 1998
27. *Visualization of the Local Contribution to the Nodal Surface of a Many-Fermion Wave Function.* A. C. Calder, M. R. Curry, R. M. Panoff, and Y. J. Wong. *Phys. Rev. E*, **53**, 5450, 1996

Contributed Papers

1. *A Case Study of Verifying and Validating an Astrophysical Simulation Code.* A. C. Calder, N. T. Taylor, K. Antypas, and D. Sheeler, in press, to appear in proc. Numerical Modeling of Space Plasma Flow held May 27-30 2006, Palm Springs, California.
2. *FLASH: Applications and Future.* K.B. Antypas, A. C. Calder, A. Dubey, J. B. Gallagher, J. Joshi, D. Q. Lamb, T. Linde, E. Lusk, O. E. B. Messer, A. Mignone, H. Pan, M. Papka, F. Peng, T. Plewa, P. M. Ricker, K. Riley, D. Sheeler, A. Siegel, N. Taylor, J. W. Truran, N. Vladimirova, G. Weirs, D. Yu, Z. Zhang. in press, proc. International Conference on Parallel Computational Fluid Dynamics, held May 24-27 2005, University of Maryland.
3. *Deflagrations Evolved from an Off-Center Ignition.* J. W. Truran, A. C. Calder, T. Plewa, N. Vladimirova, and D. Q. Lamb, in Proc. of the 12th Workshop on Nuclear Astrophysics (Ringberg Castle, March 22-27, 2004), MPA/P14, eds. E. Müller and Hans-Thomas Janka, Garching, 2004, p. 96
4. *Breaking Gravity Waves: A Mechanism for Nova Enrichment.* A. C. Calder, A. Alexakis, A. Heger, E. F. Brown, L. J. Dursi, J. W. Truran, R. Rosner, and J. Jose, in Proc. of the 12th Workshop on Nuclear Astrophysics (Ringberg Castle, March 22-27, 2004), MPA/P14, eds. E. Müller and Hans-Thomas Janka, Garching, 2004, p. 69
5. *Simulations of Rising Hydrodynamic and Magnetohydrodynamic Bubbles.* P. M. Ricker, K. Robinson, L. J. Dursi, R. Rosner, T. Linde, M. Zingale, A. C. Calder, B. Fryxell, T. Plewa, J. W. Truran, A. Caceres, K. Olson, K. Riley, A. Siegel, N. Vladimirova. In Proceedings of The Riddle of Cooling Flows in Galaxies and Clusters of Galaxies (held in Charlottesville, VA, May 31 - June 4, 2003), Eds. T. Reiprich, J. Kempner, and N. Soker. Published electronically at <http://www.astro.virginia.edu/coolflow/>
6. *A Case Study of Verifying and Validating an Astrophysical Simulation Code.* A. C. Calder, B. Fryxell, T. Plewa, R. Rosner, L. J. Dursi, V. G. Weirs, T. Dupont, H. F. Robey, J. O. Kane, B. A. Remington, R. P. Drake, G. Dimonte, M. Zingale, A. Siegel A. Caceres, K. Riley, N. Vladimirova, P. Ricker, F. X. Timmes, K. Olson, and H. M. Tufo. Prepared for Foundations 2002, October 22-23, 2002 <http://www.trainingsystems.org/events/31V0>
7. *Investigations of Pointwise Ignition of Helium Deflagrations on Neutron Stars.* M. Zingale, S. E. Woosley, A. Cumming, A. Calder, L. J. Dursi, B. Fryxell, K. Olson, P. Ricker, R. Rosner, and F. X. Timmes in 3-d Stellar Evolution, eds. S Turcotte, S. Keller, and R. Cavallo, ASP conference proceedings vol. 293, ASP, San Francisco, 2003, p. 329
8. *Onset of Convection on a Pre-Runaway White Dwarf.* L. J. Dursi, A. C. Calder, A. Alexakis, J. W. Truran, M. Zingale, B. Fryxell, P. Ricker, F. X. Timmes, and K. Olson. in Classical Nova Explosions, eds. M. Hernanz and J. Jose, AIP, Melville, 2002, p. 139

9. *Mixing by Non-linear Wave Breaking at the Surface of a White Dwarf.* A. C. Calder, A. Alexakis, L. J. Dursi, R. Rosner, J. W. Truran, B. Fryxell, P. Ricker, M. Zingale, K. Olson, F. X. Timmes, and P. MacNeice. in *Classical Nova Explosions*, eds. M. Hernanz and J. Jose, AIP, Melville, 2002, p. 134
10. *Mixing by Wave Breaking at the Surface of a White Dwarf.* J. W. Truran, A. Alexakis, L. J. Dursi, A. C. Calder, M. Zingale, B. Fryxell, P. Ricker, F. X. Timmes, R. Rosner, and K. Olson, in *Proc. of the 11th Workshop on Nuclear Astrophysics (Ringberg Castle, February 11-16, 2002)*, MPA/P13, eds. W. Hillebrandt and E. Müller, Garching, 2002, p. 186
11. *A Semi-analytic Model for the Radiation Reaction Luminosity for post-Newtonian Binary Neutron Star Mergers.* F. D. Swesty and A. C. Calder. in *Relativistic Astrophysics*, eds. J. C. Wheeler and H. Martel, AIP, Melville, 2001, p. 808
12. *Coalescing Binary Neutron Star Systems.* A. C. Calder, F. D. Swesty, and E. Y. M. Wang. in *Relativistic Astrophysics*, eds. J. C. Wheeler and H. Martel, AIP, Melville, 2001, p. 796
13. *Quenching Processes in Flame-Vortex Interactions.* M. Zingale, J. C. Niemeyer, F. X. Timmes, L. J. Dursi, A. C. Calder, B. Fryxell, D. Q. Lamb, K. Olson, P. M. Ricker, R. Rosner, and P. MacNeice. in *Relativistic Astrophysics*, eds. J. C. Wheeler and H. Martel, AIP, Melville, 2001, p. 490
14. *Simulations of Astrophysical Fluid Instabilities.* A. C. Calder, B. Fryxell, R. Rosner, L. J. Dursi, K. Olson, P. M. Ricker, F. X. Timmes, M. Zingale, P. MacNeice, and H. M. Tufo. in *Relativistic Astrophysics*, eds. J. C. Wheeler and H. Martel, AIP, Melville, 2001, p. 484
15. *Adaptive Mesh Simulations of Astrophysical Detonations Using the ASCI Flash Code.* B. Fryxell, A. C. Calder, L. J. Dursi, D. Q. Lamb, P. MacNeice, K. Olson, P. M. Ricker, R. Rosner, F. X. Timmes, J. W. Truran, H. M. Tufo, M. Zingale. 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. AIP Press, Melville, 2001, p. 223
16. *Large-Scale Simulations of Clusters of Galaxies.* P. M. Ricker, A. C. Calder, L. J. Dursi, B. Fryxell, D. Q. Lamb, P. MacNeice, K. Olson, R. Rosner, F. X. Timmes, J. W. Truran, H. M. Tufo, M. Zingale. 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. AIP Press, Melville, 2001, p. 316
17. *Numerical Simulations of Thermonuclear Flashes on Neutron Stars.* B. Fryxell, M. Zingale, F. X. Timmes, D. Q. Lamb, K. Olson, A. C. Calder, L. J. Dursi, P. Ricker, R. Rosner, J. W. Truran, P. MacNeice, and H. Tufo. in *Proc. of the Sixth International Conference on Nuclei in the Cosmos, Aarhus, Denmark, 27 June - 1 July, 2000.* ed. J. Christensen-Dalsgaard and K. Langanke, Elsevier, Amsterdam 2001, p. 172c
18. *What is 29 Doradus?* J. R. Dickel, J. B. Kaler, A. C. Calder, R. F. Webbink, E. Olszewski, D. Welch, E. C. Olson, N. L. Romero, and D. F. Bright. *Mercury*, **29** No. 5, 38, 2000
19. *Helium Detonations on Neutron Stars.* B. Fryxell, M. Zingale, F. X. Timmes, D. Q. Lamb, K. Olson, A. C. Calder, L. J. Dursi, P. Ricker, R. Rosner, J. W. Truran, P. MacNeice, and H. Tufo. in *Proc. of the 10th Workshop on Nuclear Astrophysics (Ringberg Castle, March 20-25, 2000)*, MPA/P12, eds. W. Hillebrandt and E. Müller, Garching, 2000, p. 38
20. *Numerical Models of Newtonian and Post-Newtonian Binary Neutron Star Mergers.* E. Y. M. Wang, F. D. Swesty, and A. C. Calder, in *Stellar Evolution, Stellar Explosions, and Galactic Chemical Evolution*, ed. A. Mezzacappa, IOP Publishing Ltd, Bristol, 1998, p. 723

21. *Numerical Methods for Modeling Binary Neutron Star Systems.* A. C. Calder, F. D. Swesty, and E. Y. M. Wang, in *Stellar Evolution, Stellar Explosions, and Galactic Chemical Evolution*, ed. A. Mezzacappa, IOP Publishing Ltd, Bristol, 1998, p. 715