

Michael Zingale / Publications and Talks

Refereed Publications

53. *MAESTROeX: A Massively Parallel Low Mach Number Astrophysical Solver*,
D. Fan, A. Nonaka, A. S. Almgren, A. Harpole, & M. Zingale
2019, submitted to ApJ
52. *AMReX: a framework for block-structured adaptive mesh refinement*,
W. Zhang, A. Almgren, V. Beckner, J. Bell, J. Blaschke, C. Chan, M. Day, B. Friesen, K. Gott,
D. Graves, M. P. Katz, A. Myers, T. Nguyen, A. Nonaka, M. Rosso, S. Williams, & M. Zingale
2019, Journal of Open Source Software, 4, 37, 1370
51. *Numerical Stability of Detonations in White Dwarf Simulations*,
M. P. Katz & M. Zingale
2019, ApJ, 874, 169
50. *pyro: a framework for hydrodynamics explorations and prototyping*,
A. Harpole, M. Zingale, I. Hawke, & T. Chegini
2019, Journal of Open Source Software, 4, 34, p. 1265
49. *Toward Resolved Simulations of Burning Fronts in Thermonuclear X-ray Bursts*,
M. Zingale, K. Eiden, Y. Cavecchi, A. Harpole, J. B. Bell, M. Chang, I. Hawke, M. P. Katz,
C. M. Malone, A. J. Nonaka, D. E. Willcox, & W. Zhang
2019, Journal of Physics: Conference Series, 1225, p. 012005
48. *Thermonuclear (Type Ia) Supernovae and Progenitor Evolution*,
A. C. Calder, D. E. Willcox, C. J. DeGrendele, D. Shangase, M. Zingale, & D. M. Townsley
2019, Journal of Physics: Conference Series, 1225, p. 012002
47. *Turbulence-driven thermal and kinetic energy in the atmospheres of hot Jupiters*,
T. Ryu, M. Zingale, & R. Perna
2018, Monthly Notices of the Royal Astronomical Society, 481, 4, 5517–5531
46. *pynucastro: an interface to nuclear reaction rates and code generator for reaction network equations*,
D. E. Willcox & M. Zingale
2018, Journal of Open Source Software, 3 (23), 588; DOI: <https://doi.org/10.21105/joss.00588>
45. *Observatory science with eXTP*,
J. J. M. in 't Zand et al.
2018, Science China Physics, Mechanics & Astronomy, 62, 29506

44. *Meeting the Challenges of Modeling Astrophysical Thermonuclear Explosions: Castro, Maestro, and the AMReX Astrophysics Suite*,
M. Zingale, A. S. Almgren, M. G. Barrios Sazo, V. E. Beckner, J. B. Bell, B. Friesen, A. M. Jacobs, M. P. Katz, C. M. Malone, A. J. Nonaka, D. E. Willcox, & W. Zhang
2018, Journal of Physics: Conference Series, 1031, 1, p. 012024
43. *Best Practices in Running Collaborative GPU Hackathons: Advancing Scientific Applications with a Sustained Impact*,
S. Chandrasekaren, G. Juckeland, M. Otten, M. Lin, J. E. Stone, M. Zingale, & F. Foertter
2018, Computing in Science and Engineering, 20, 4, 95–106
42. *Toward Simulating Black Widow Binaries with Castro*,
P. Karpov, M. Barrios Sazo, M. Zingale, W. Zhang, & A. C. Calder
2017, Journal of Computational Science Education, 8, 25–29
41. *Review: White paper on nuclear astrophysics and low energy nuclear physics Part 1: Nuclear astrophysics*,
A. Arcones, D. Bardayan, T. Beers, L. Bernstein, J. Blackmon, M. Bronson, A. Brown, E. Brown, C. Brune, A. Champagne, A. Chieffi, A. Couture, P. Danielewicz, R. Diehl, M. El-Eid, J. Escher, B. Fields, C. Frohlich, F. Herwig, W. R. Hix, C. Iliadis, W. Lynch, G. McLaughlin, B. Meyer, A. Mezzacappa, F. Nunes, B. O'Shea, M. Prakash, B. Pritychenko, S. Reddy, E. Rehm, G. Rogachev, R. Rutledge, H. Schatz, M. Smith, I. Stairs, A. Steiner, T. Strohmayer, F. Timmes, D. Townsley, M. Wiescher, R. Zegers, & M. Zingale
2017, Progress in Particle and Nuclear Physics, 94, 1
40. *Low Mach Number Modeling of Convection in Helium Shells on Sub-Chandrasekhar White Dwarfs II: Bulk Properties of Simple Models*,
A. M. Jacobs, M. Zingale, A. Nonaka, A. S. Almgren, & J. B. Bell
2016, ApJ, 827, 84
39. *Double White Dwarf Mergers on Adaptive Meshes I. Methodology and Code Verification*,
M. P. Katz, M. Zingale, A. C. Calder, F. D. Swesty, A. S. Almgren, W. Zhang
2016, ApJ, 819, 94
38. *Comparisons of Two- and Three-Dimensional Convection in Type I X-ray Bursts*
M. Zingale, C. M. Malone, A. Nonaka, A. S. Almgren, & J. B. Bell
2015, ApJ, 807, 60
37. *On the Piecewise Parabolic Method for Compressible Flow with Stellar Equations of State*,
M. Zingale & M. P. Katz
2015, ApJS, 216, 31

36. *pyro: A teaching code for computational astrophysical hydrodynamics*,
M. Zingale
2014, *Astronomy & Computing*, 6, 52
35. *Multidimensional Modeling of Type I X-ray Bursts. II. Two-Dimensional Convection in a Mixed H/He Accretor*,
C. M. Malone, M. Zingale, A. Nonaka, A. S. Almgren, & J. B. Bell
2014, *ApJ*, 788, 115
34. *The Deflagration Stage of Chandrasekhar Mass Models For Type Ia Supernovae: I. Early Evolution*,
C. M. Malone, A. Nonaka, S. E. Woosley, A. S. Almgren, J. B. Bell, S. Dong, & M. Zingale
2014, *ApJ*, 782, 11
33. *Low-Mach Number Modeling of Core Convection in Massive Stars*,
C. Gilet, A. S. Almgren, J. B. Bell, A. Nonaka, S. E. Woosley, & M. Zingale
2013, *ApJ*, 773, 137
32. *Low Mach Number Modeling of Convection in Helium Shells on Sub-Chandrasekhar White Dwarfs. I. Methodology*,
M. Zingale, A. Nonaka, A. S. Almgren, J. B. Bell, C. M. Malone, & R. J. Orvedahl
2013, *ApJ*, 764, 97
31. *High-Resolution Simulations of Convection Preceding Ignition in Type Ia Supernovae Using Adaptive Mesh Refinement*,
A. Nonaka, A. J. Aspden, M. Zingale, A. S. Almgren, J. B. Bell, & S. E. Woosley
2012, *ApJ*, 745, 73
30. *The Convective Phase Preceding Type Ia Supernovae*,
M. Zingale, A. Nonaka, A. S. Almgren, J. B. Bell, C. M. Malone, & S. E. Woosley
2011, *ApJ*, 740, 8
29. *Multidimensional Modeling of Type I X-ray Bursts. I. Two-Dimensional Convection Prior to the Outburst of a Pure He Accretor*,
C. M. Malone, A. Nonaka, A. S. Almgren, J. B. Bell, & M. Zingale
2011, *ApJ*, 728, 118
28. *CASTRO: A New Compressible Astrophysical Solver. I. Hydrodynamics and Self-Gravity*,
A. S. Almgren, V. E. Beckner, J. B. Bell, M. S. Day, L. H. Howell, C. C. Joggerst, M. J. Lijewski, A. Nonaka, M. Singer, & M. Zingale
2010, *ApJ*, 715, 1221

27. *MAESTRO: An Adaptive Low Mach Number Hydrodynamics Algorithm for Stellar Flows*,
A. Nonaka, A. S. Almgren, J. B. Bell, M. J. Lijewski, C. Malone, & M. Zingale
2010, *ApJS*, 188, 358
26. *Low Mach Number Modeling of Type Ia Supernovae. IV. White Dwarf Convection*,
M. Zingale, A. S. Almgren, J. B. Bell, A. Nonaka, & S. E. Woosley
2009, *ApJ*, 704, 196
25. *A New Low Mach Number Approach in Astrophysics*,
A. S. Almgren, J. B. Bell, A. Nonaka, & M. Zingale
2009, *CiSE*, 11, 24
24. *Turbulence-Flame Interactions in Type Ia Supernovae*,
A. J. Aspden, J. B. Bell, M. S. Day, S. E. Woosley, & M. Zingale
2008, *ApJ*, 689, 1173
23. *Low Mach Number Modeling of Type Ia Supernovae. III. Reactions*,
A. S. Almgren, J. B. Bell, A. Nonaka, & M. Zingale
2008, *ApJ* 684, 449
22. *Propagation of the First Flames in Type Ia Supernovae*,
M. Zingale and L. J. Dursi
2007, *ApJ*, 656, 333
21. *Low Mach Number Modeling of Type Ia Supernovae. II. Energy Evolution*,
A. S. Almgren, J. B. Bell, C. A. Rendleman, & M. Zingale
2006, *ApJ*, 649, 927
20. *Low Mach Number Modeling of Type Ia Supernovae. I. Hydrodynamics*,
A. S. Almgren, J. B. Bell, C. A. Rendleman, & M. Zingale
2006, *ApJ*, 637, 922
19. *Three-Dimensional Numerical Simulations of Rayleigh-Taylor Unstable Flames in Type Ia Supernovae*,
M. Zingale, S. E. Woosley, C. A. Rendleman, M. S. Day, & J. B. Bell
2005, *ApJ*, 632, 1021
18. *Validating an Astrophysical Simulation Codes*,
A. C. Calder, L. J. Dursi, B. Fryxell, T. Plewa, V. G. Weirs, T. Dupont, H. F. Robey, R. P. Drake,
B. A. Remington, G. Dimonte, J. Hayes, J. M. Stone, P. M. Ricker, F. X. Timmes, M. Zingale,
& K. Olson
2004, *CiSE*, 6, 10

17. *Direct Numerical Simulations of Type Ia Supernovae Flames II: The Rayleigh-Taylor Instability*,
J. B. Bell, M. S. Day, C. A. Rendleman, S. E. Woosley, & M. Zingale
2004, ApJ, 608, 883
16. *Direct Numerical Simulations of Type Ia Supernovae Flames I: The Landau-Darrieus Instability*,
J. B. Bell, M. S. Day, C. A. Rendleman, S. E. Woosley, & M. Zingale
2004, ApJ, 606, 1029
15. *On the Nonlinear Evolution of Wind-driven Gravity Waves*,
A. Alexakis, A. C. Calder, L. J. Dursi, R. Rosner, J. W. Truran, B. Fryxell, M. Zingale, F. X. Timmes,
K. Olson, & P. Ricker
2004, Phys. of Fluids, 16, 9, 3256
14. *Adaptive Low Mach Number Simulations of Nuclear Flames*,
J. B. Bell, M. S. Day, C. A. Rendleman, S. E. Woosley, & M. Zingale
2004, JCP, 195, 2, 677
13. *A Comparative Study of the Turbulent Rayleigh-Taylor Instability Using High-Resolution Three-Dimensional Numerical Simulations: The Alpha-Group Collaboration*,
G. Dimonte, D. L. 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, & M. Zingale
2004, Phys. of Fluids, 16, 5, 1668
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, & K. Olson
2004, ApJ, 602, 931
11. *Morphology of Rising Hydrodynamic and Magneto-hydrodynamic Bubbles from Numerical Simulations*,
K. Robinson, L. J. Dursi, P. M. Ricker, R. Rosner, A. C. Calder, M. Zingale, T. Linde, A. Caceres,
B. Fryxell, K. Olson, K. Riley, A. Siegel, J. W. Truran, & N. Vladimirova
2004, ApJ, 601, 621
10. *Parallel netCDF: A High-Performance Scientific I/O Interface*,
J. Li, W.-k. Laio, A. Choudhary, R. Ross, R. Thakur, R., W. Gropp, R. Latham, A. Siegel,
B. Gallagher, & M. Zingale
2003, technical paper, SC2003

9. *The Response of Astrophysical Thermonuclear Flames to Curvature and Stretch*,
L. J. Dursi, M. Zingale, A. Calder, B. Fryxell, F. X. Timmes, N. Vladimirova, R. Rosner, A. Caceres, D. Q. Lamb, K. Olson, P. M. Ricker, K. Riley, A. Siegel, & J. W. Truran
2003, ApJ, 595, 955
8. *Mapping Initial 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, & N. Vladimirova
2002, ApJS, 143, 539
7. *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, & H. M. Tufo
2002, ApJS, 142, 201
6. *A Case Study in Application I/O on Linux Clusters*,
R. Ross, D. Nurmi, A. Cheng, & M. Zingale
2001, technical paper, SC2001
5. *Helium Detonations on Neutron Stars*,
M. Zingale, F. X. Timmes, B. Fryxell, D. Q. Lamb, K. Olson, A. C. Calder, L. J. Dursi, P. Ricker, R. Rosner, P. MacNeice, & H. Tufo
2001, ApJS, 133, 195
4. *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, H. M. Tufo, J. W. Truran, & M. Zingale
2000, Gordon Bell Prize winner/Special category, technical paper, SC2000
3. *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, & R. Rosner
2000, ApJ, 543, 938
2. *FLASH: An Adaptive Mesh Hydrodynamics Code for Modeling Astrophysical Thermonuclear Flashes*,
B. Fryxell, K. Olson, P. Ricker, F. X. Timmes, M. Zingale, D. Q. Lamb, P. MacNeice, R. Rosner, & H. Tufo
2000, ApJS, 131, 273

1. *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. Truran, H. Tufo, Y. Young, M. Zingale, E. Lusk, & R. Stevens
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Conference Proceedings

24. *The LOFT mission concept: a status update*,
M. Feroci et al.
2016, Proc. SPIE 9905, Space Telescopes and Instrumentation 2016: Ultraviolet to Gamma
Ray, 99051R, July 25, 2016
23. *Understanding Ignition in Type Ia Supernovae*,
M. Zingale, A. Jacobs, A. S. Almgren, J. B. Bell, A. Nonaka, C. Malone, & S. Woosley
2015, extended abstract for the 25th International Colloquium on the Dynamics of Explosions
and Reactive Systems, Leeds, UK, Aug. 2–7, 2015
22. *Low Mach Number Modeling of Stratified Flows*,
A. S. Almgren, J. B. Bell, A. Nonaka, & M. Zingale
2014, in Finite Volumes for Complex Applications VII: Methods, Theoretical Aspects—FVCA
7, Berlin, June 2014, ed. Fuhrmann, J., Ohlberger, M., & Rohde, C., 3–15
Proceedings of the FVCA7 - The International Symposium of Finite Volumes for Complex
Applications VII Berlin, June 15–20, 2014
21. *From Convection to Explosion: End-to-End Simulation of Type Ia Supernovae*,
A. Nonaka, A. S. Almgren, J. B. Bell, H. Ma, S. E. Woosley, & M. Zingale
2011, Proceedings of SciDAC 2011, Denver, CO, July 10–14, 2011, <http://press.mcs.anl.gov/scidac2011/>
20. *MAESTRO, CASTRO, and SEDONA — Petascale Codes for Astrophysical Applications*,
A. Almgren, J. Bell, D. Kasen, M. Lijewski, A. Nonaka, P. Nugent, C. Rendlement, R. Thomas,
& M. Zingale
2010, Proceedings of the 2010 Scientific Discovery through Advanced Computing (SciDAC)
Conference. Chattanooga, Tennessee, July 11–15, 2010. Oak Ridge National Laboratory.
<http://computing.ornl.gov/workshops/scidac2010/>
19. *Type Ia Supernovae: Advances in Large Scale Simulation*,
H. Ma, M. Zingale, S. E. Woosley, A. J. Aspden, J. B. Bell, A. S. Almgren, A. Nonaka, &
S. Dong
2010, Proceedings of the 2010 Scientific Discovery through Advanced Computing (SciDAC)
Conference. Chattanooga, Tennessee, July 11–15, 2010. Oak Ridge National Laboratory.
<http://computing.ornl.gov/workshops/scidac2010/>

18. *Type Ia Supernovae: Advances in Large Scale Simulation*,
S. E. Woosley, A. S. Almgren, A. J. Aspden, J. B. Bell, D. Kasen, A. R. Kerstein, H. Ma, A. Nonaka, & M. Zingale
2009, Proceedings of SciDAC 2009, Journal of Physics: Conference Series, 180, 012023.
17. *Astrophysical Applications of the Maestro Code*,
M. Zingale, A. S. Almgren, J. B. Bell, C. M. Malone, & A. Nonaka
2008, Proceedings of SciDAC 2008, Journal of Physics: Conference Series, 125, 012013.
16. *Type Ia supernovae*,
S. E. Woosley, A. Almgren, J. B. Bell, G. Glatzmaier, D. Kasen, A. R. Kerstein, H. Ma, P. Nugent, F. Röpke, V. Sankaran, & M. Zingale
2007, Proceedings of SciDAC 2007, Journal of Physics: Conference Series, 78, 012081.
15. *MAESTRO: A Low Mach Number Stellar Hydrodynamics Code*,
A. S. Almgren, J. B. Bell, & M. Zingale
2007, Proceedings of SciDAC 2007, Journal of Physics: Conference Series, 78, 012085.
14. *New Approaches for Modeling Type Ia Supernovae*,
M. Zingale, A. S. Almgren, J. B. Bell, M. S. Day, C. A. Rendleman, & S. E. Woosley
2006, Proceedings of SciDAC 2006, Journal of Physics: Conference Series, 46, 385.
13. *Efficiency Gains from Time Refinement on AMR Meshes and Explicit Timestepping*,
L. J. Dursi & M. Zingale
2005, Adaptive Mesh Refinement—Theory and Applications, Proceedings of the Chicago Workshop on Adaptive Mesh Refinement Methods, Sept. 3–5, 2003 Series: Lecture Notes in Computational Science and Engineering, Vol. 41 Plewa, Tomasz; Linde, Timur; Weirs, V. Gregory (Eds.) 2005, XIV, 554
12. *The Physics of Flames in Type Ia Supernovae*,
M. Zingale, S. E. Woosley, J. B. Bell, M. S. Day, & C. A. Rendleman
2005, Proceedings of SciDAC 2005, Journal of Physics: Conference Series, 16, 405.
11. *Simulations of Rising Hydrodynamic and Magnetohydrodynamic Bubbles*,
P. M. Ricker, K. Robinson, L. J. Dursi, R. Rosner, A. C. Calder, M. Zingale, J. W. Truran, T. Linde, A. Caceres, B. Fryxell, K. Olson, K. Riley, K. A. Siegel, & N. Vladimirova
2004, 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.
10. *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, & F. X. Timmes

- 2002, 3D Stellar Evolution, ASP Conference Proceedings, Vol. 293, 22–26 July 2002 at UC Davis, Livermore, CA, Ed. by S. Turcotte, S. C. Keller, & R. M. Cavallo.
9. *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, & K. Olson
2002, Classical Nova Explosions: International Conference on Classical Nova Explosions. AIP Conference Proceedings, Vol. 637. Sitges, Spain, 20–24 May, 2002. Edited by M. Hernanz & J. Jose
8. *Mixing by Non-linear Gravity Wave Breaking on a White Dwarf Surface*,
A. C. Calder, A. Alexakis, L. J. Dursi, R. Rosner, J. W. Truran, B. Fryxell, P. Ricker, M. Zingale, K. Olson, F. X. Timmes, & P. MacNeice
2002, Classical Nova Explosions: International Conference on Classical Nova Explosions. AIP Conference Proceedings, Vol. 637. Sitges, Spain, 20–24 May, 2002. Edited by M. Hernanz & J. Jose
7. *Mixing by Wave Breaking at the Surface of a White Dwarf*,
J. W. Truran, A. Alexakis, A. C. Calder, L. J. Dursi, M. Zingale, B. Fryxell, P. Ricker, F. X. Timmes, K. Olson, & R. Rosner
2002, Proceedings of the 11th Workshop on “Nuclear Astrophysics”, Ringberg Castle, Tegernsee, Germany, February 11–16, 2002 / Wolfgang Hillebrandt and Ewald Müller (Eds.). MPA/P13, Garching b. München, Germany: Max-Planck-Institut für Astrophysik, 186.
6. *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, & H. Tufo
2001, Nuclear Physics A, 688, 172.
5. *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. Ricker, R. Rosner, J. W. Truran, & P. MacNeice
2001, 20th Texas Symposium on Relativistic Astrophysics, Austin, Texas, 10–15 Dec. 2000, Melville, NY: AIP Conference Proceedings, Vol. 586. Edited by J. C. Wheeler & H. Martel, also AIP Conference Series 586, 490–492.
4. *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, & H. M. Tufo
2001, 20th Texas Symposium on Relativistic Astrophysics, Austin, Texas, 10–15 Dec. 2000, Melville, NY: AIP Conference Proceedings, Vol. 586. Edited by J. C. Wheeler & H. Martel.

3. *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
Proceedings of the VII International Workshop on Advanced Computing and Analysis Techniques in Physics Research (ACAT 2000), Fermilab, October 16–20, 2000.
2. *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
Proceedings of the VII International Workshop on Advanced Computing and Analysis Techniques in Physics Research (ACAT 2000), Fermilab, October 16–20, 2000.
1. *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, & H. Tufo
Proceedings of the 10th Workshop on “Nuclear Astrophysics”, Ringberg Castle, Tegernsee, Germany, March 20–25 2000.

Open Books

2. *Teaching and Learning with Jupyter*,
L. A. Barba, L. J. Barker, D. S. Blank, J. Brown, A. B. Downey, T. George, L. J. Heagy, K. T. Mandli, J. K. Moore, D. Lippert, K. E. Niemeyer, R. R. Watkins, R. H. West, E. Wickes, C. Willing, & M. Zingale
<https://jupyter4edu.github.io/jupyter-edu-book/>
1. *Introduction to Computational Astrophysical Hydrodynamics*,
M. Zingale
https://github.com/Open-Astrophysics-Bookshelf/numerical_exercises

White Papers

5. MMA SAG: Thermonuclear Supernovae,
M. Zingale, C. Fryer, A. Hungerford, S. Safi-Harb, R. Trappitsch, R. Fisher, A. Calder, & K. Shen
Astro2020: Decadal Survey on Astronomy and Astrophysics, science white papers, no. 259; Bulletin of the American Astronomical Society, Vol. 51, Issue 3, id. 259 (2019)
4. *The Importance of Computation in Astronomy Education*,
M. Zingale, F. X. Timmes, R. Fisher, & B. W. O’Shea
2016, white paper submitted to the AAS Education Taskforce call
(<https://aas.org/posts/opportunity/2016/04/aas-task-force-education-begins-its-work>)

3. *White Paper on Nuclear Astrophysics,*

A. Arcones, D. Bardayan, T. Beers, L. Bernstein, J. Blackmon, M. Bronson, A. Brown, E. Brown, C. Brune, A. Champagne, A. Chieffi, A. Couture, P. Danielewicz, R. Diehl, M. El-Eid, J. Escher, B. Fields, C. Frohlich, F. Herwig, W. R. Hix, C. Iliadis, W. Lynch, G. McLaughlin, B. Meyer, A. Mezzacappa, F. Nunes, B. O'Shea, M. Prakash, B. Pritychenko, S. Reddy, E. Rehm, G. Rogachev, R. Rutledge, H. Schatz, M. Smith, I. Stairs, A. Steiner, T. Strohmayer, F. Timmes, D. Townsley, M. Wiescher, R. Zegers, & M. Zingale

2016, Community white paper based on 2012 JINA Town Meeting in Detroit, MI, and 2014 APS Town Meeting in College Station, TX

2. *Modeling Astrophysical Explosions with Sustained Exascale Computing,*

M. Zingale, A. C. Calder, C. M. Malone, & F. X. Timmes

2015, Response to RFI NOT-GM-15-122: *Science Drivers Requiring Capable Exascale High Performance Computing*

1. *The LOFT perspective on neutron star thermonuclear bursts,*

J. J. M. in 't Zand, D. Altamirano, D. R. Ballantyne, S. Bhattacharyya, E. F. Brown, Y. Cavechi, D. Chakrabarty, J. Chenevez, A. Cumming, N. Degenaar, M. Falanga, D. K. Galloway, A. Heger, J. José, L. Keek, M. Méndez, S. Mahmoodifar, M. Linares, C. M. Malone, M. C. Miller, F. B. S. Paerels, J. Poutanen, A. Rózańska, H. Schatz, M. Serino, V. F. Suleimanov, T. E. Strohmayer, F.-K. Thielemann, A. L. Watts, N. N. Weinberg, S. E. Woosley, W. Yu, S. Zhang, & M. Zingale

2015, White Paper in Support of the Mission Concept of the Large Observatory For x-ray Timing

Invited Lectures / Seminars / Colloquia

- 07/05/2019 Invited talk at AstroNum 2019—14th International Conference on Numerical Modeling of Space Plasma Flows, Paris, France, *Improved Coupling of Hydrodynamics and Nuclear Burning in Astrophysical Flows using SDC*
- 02/26/2019 Invited talk in the *Spectral Deferred Correction Methods for Temporal Integration* session at the SIAM Computational Science and Engineering 2019 meetin, *Improved Coupling of Hydrodynamics and Nuclear Burning in Astrophysical Flows using SDC*
- 10/12/2018 Flatiron Institute Center for Computational Astrophysics Colloquium, *Algorithmic Demands for Modeling X-ray Bursts and Type Ia Supernovae*
- 08/23/2018 Talk at the TEAMS Collaboration meeting, *StarKiller Microphysics*
- 06/26/2018 Invited talk at AstroNum 2018—13th International Conference on Numerical Modeling of Space Plasma Flows, Panama City, Florida, *Modeling X-ray Bursts with the AMReX Astrophysics Suite*
- 08/10/2017 Seminar at LLNL High Energy Density Science Center, LLNL, *Modeling Stellar Explosions with the AMReX Astrophysics Suite*
- 07/27/2017 Seminar at Computational Science Initiative, BNL, *The AMReX Astrophysics Suite: Simulating the Stars at the Exascale*

- 06/30/2017 Invited talk at AstroNum 2017—12th International Conference on Numerical Modeling of Space Plasma Flows, St. Malo, France, *Computational Challenges of Modeling X-ray Bursts and Type Ia Supernovae*
- 06/02/2017 Invited participant / overview talk at Stellar Hydro Days, University of Victoria, *Modeling Stellar Convection and Explosions with Maestro, Castro, and the BoxLib/AMReX Astrophysics Suite*
- 04/05/2017 Astronomy Seminar at Michigan State University, *Computational Challenges of Modeling X-ray Bursts and Type Ia Supernovae*
- 02/23/2017 Seminar at Stony Brook Institute for Advanced Computational Science, *Computational Challenges of Modeling X-ray Bursts and Type Ia Supernovae*
- 06/15/2016 Case study talk at DOE Nuclear Physics / ASCR Exascale Requirements Review, Gaithersburg, MD, *Thermonuclear Transients*
- 04/29/2016 Seminar at Oak Ridge National Laboratory, *Modeling Stellar Explosions with Maestro, Castro, and the BoxLib Astrophysics Suite*
- 03/17/2016 Talk at the 18th Workshop on Nuclear Astrophysics, Ringberg Castle, Tegernsee, Germany, *Models of convection in X-ray bursts and pre-SNe Ia white dwarfs*
- 02/26/2016 Seminar at the U. S. Naval Research Laboratory, *Computational Challenges of Modeling X-ray Bursts and Type Ia Supernovae*
- 08/02/2015 Invited talk at the International Colloquium on the Dynamics of Explosions and Reactive Systems (ICDERS), Leeds, UK, *Understanding Ignition in Type Ia Supernovae*
- 06/22/2015 Invited talk at the OLCF User's Meeting, ORNL, Oak Ridge, TN, *Computation Challenges of Modeling Astrophysical Explosions*
- 06/03/2015 Invited talk at the Fifty One Ergs meeting, NCSU, *Modeling the Early Phases of Type Ia Supernovae*
- 05/24/2015 "Setting the Stage" talk on *Stellar Hydrodynamics* at the JINA GNASH: The anomalous metal-poor stars and convective-reactive nuclear astrophysics workshop, Victoria, BC, Canada, <http://jina-cee.phys.uvic.ca/gnash-workshop/talks-and-contributions/monday/setting-the-stage>
- 04/08/2015 Seminar at U Mass Dartmouth, *Algorithmic Developments for Modeling Stellar Explosions*
- 01/15/2015 CCS-2 Seminar at Los Alamos National Laboratory, *The Challenges of Modeling Type Ia Supernovae and X-ray Bursts*
- 09/15/2014 Invited talk at the *Type Ia Supernovae: progenitors, explosions, and cosmology* conference, Chicago, IL, *Modeling the Early Phases of SNe Ia*, <https://kicp-workshops.uchicago.edu/sn2014/presentations.php>
- 04/30/2014 Invited presentation at *Large Scale Computing and Storage Requirements for Nuclear Physics (NP): Target 2017 meeting*, *Convection in X-ray Bursts*
- 02/28/2014 Astronomy Seminar at the Center for Cosmology and Particle Physics, New York University, *Modeling Convective Burning in Type Ia Supernovae and X-ray Bursts*
- 09/27/2013 Nuclear Theory Seminar at Brookhaven National Lab, *Modeling Convective Burning in Type Ia Supernovae and X-ray Bursts*

- 07/09/2013 Seminar at the Flash Center, University of Chicago, *Modeling Convective Burning in Type Ia Supernovae and X-ray Bursts*
- 10/10/2012 Astro Computation working group at 2012 Nuclear Astrophysics Town Meeting, *Thermonuclear Driven Events*
- 04/04/2012 Nuclear Astrophysics Seminar at Ohio University entitled *The Challenges of Modeling Explosive Phenomena*
- 07/28/2010 Invited talk at the Lorentz Center Workshop on *X-ray Bursts and Burst Oscillations* entitled *The Algorithmic Challenges of Multidimensional Models of X-ray Bursts*, <http://www.lorentzcenter.nl/lc/web/2010/408/info.php3?wsid=408>
- 05/13/2010 Joint NRAO / UVa Dept. of Astronomy Colloquium (Charlottesville, VA) entitled *Modeling Convection and Ignition in Type Ia Supernovae*
- 03/31/2010 Center for the Study of Cosmic Evolution Seminar, Dept. of Physics and Astronomy, Michigan State University (E. Lansing, MI), entitled: *Modeling Convection and Ignition in Type Ia Supernovae*
- 05/12/2009 Astronomy Seminar at the American Museum of Natural History (New York, NY), entitled: *Modeling Convection and Ignition in Type Ia Supernovae*
- 09/30/2008 Astronomy Seminar at the Institute for Advanced Studies (Princeton, NJ), entitled: *New Methods for Modeling Type Ia Supernovae*
- 07/15/2008 Invited Poster at the SciDAC 2008 conference (Seattle, WA), entitled: *Astrophysical Applications of the Maestro Code* (with co-authors: A. S. Almgren, J. B. Bell, C. M. Malone, & A. J. Nonaka)
- 04/06/2007 Astronomy Seminar at Rutgers University (New Brunswick, NJ), entitled: *The Challenges of Modeling Type Ia Supernova*
- 10/31/2006 Astronomy Colloquia at McGill University (Montreal, CA), entitled: *Understanding Type Ia Supernovae*
- 06/27/2006 Invited talk at the SciDAC 2006 conference (Denver, CO), entitled: *The Challenges of Modeling Type Ia Supernovae*
- 10/03/2005 T-13 Seminar, Los Alamos National Laboratory, entitled: *Simulations of Thermonuclear Flames in Type Ia Supernovae*
- 06/26/2005 Invited poster at the SciDAC 2005 conference (San Francisco, CA), *The Physics of Thermonuclear Flames in Type Ia Supernovae*
- 03/01/2005 Astronomy Seminar at SUNY Stony Brook, *Flame Instabilities in Type Ia Supernovae*
- 02/23/2005 N Division Seminar, Lawrence Livermore National Laboratory, *Flame Instabilities in Type Ia Supernovae*
- 12/17/2003 Astrophysics Seminar, Institute for Advanced Study, Princeton, NJ, *Flame Instabilities in Type Ia Supernovae*

Popular Press Features

How Stars Explode, Forbes.com, Oct. 1, 2009

(<http://www.forbes.com/2009/09/30/supernovae-universe-science-technology-breakthroughs-stars.html>)

Unveiled: The First Full 3-D Model of a Star Going Supernova, Popular Science Online, Sept. 24, 2009
(<http://www.popsci.com/military-aviation-amp-space/article/2009-09/first-3-d-models-white-dwarf-supernova>)

Flash Upon a Neutron Star, American Scientist, Sept.–Oct. 2000, vol. 88, no. 5, p. 400.

Popular Press Mentions

Stars Go Kaboom, Spilling Cosmic Secrets, Science News, 2009, Vol. 176, #4 (Aug. 15, 2009)
(see also http://www.sciencenews.org/view/feature/id/46029/title/Stars_go_kaboom,_spilling_cosmic_secrets)

Supernova explosion simulated in exquisite detail, New Scientist Online, July 2006
(<http://www.newscientist.com/article/dn9604-supernova-explosion-simulated-in-exquisite-detail.html>)

Life-or-Death Question: How Supernovas Happen? NY Times, Nov. 9, 2004.

Physics Today cover, Feb. 2002.