Michael Zingale / Publications and Talks

Refereed Publications

74. *Strong Coupling of Hydrodynamics and Reactions in Nuclear Statistical Equilibrium for Modeling Convection in Massive Stars,* M. Zingale, Z. Chen, E. T. Johnson, M. P. Katz, & A. Smith Clark, 2024, submitted to Astrophysical Journal

73. *Hydrodynamical simulations of proton ingestion flashes in Type I X-ray Bursts,* S. Guichandut, M. Zingale, & A. Cumming, 2024, accepted to Astrophysical Journal

72. *Sensitivity of Simulations of Double Detonation Type Ia Supernova to Integration Methodology,* M. Zingale, Z. Chen, M. Rasmussen, A. Polin, M. Katz, A. Smith Clark, & E. T. Johnson, 2024, ApJ, 966, 150
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71. *Simulating Lateral H/He Flame Propagation in Type I X-ray Bursts,* E. Johnson & M. Zingale, 2024, Journal of Physics: Conference Series, 2742, 1, p. 012005
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70. *pynucastro 2.1: an update on the development of a python library for nuclear astrophysics,* A. Smith Clark, E. T. Johnson, Z. Chen, K. Eiden, M. Zingale, B. Boyd, P. Johnson, & L. Rangel DaCosta, 2024, Journal of Physics: Conference Series, 2742, 1, p. 012003
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69. *Sensitivity of 3D Convective Urca Simulations to Changes in Urca Reactions,* B. Boyd, A. Smith Clark, A. C. Calder, D. M. Townsley, & M. Zingale, 2024, Journal of Physics: Conference Series, 2742, 1, p. 012001
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63. *Neural Networks for Nuclear Reactions in MAESTROeX,*

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    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.

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.

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.
    DOI: 10.1088/1742-6596/180/1/012023

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.
    DOI: 10.1088/1742-6596/125/1/012013

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.
    DOI: 10.1088/1742-6596/78/1/012081

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.
    DOI: 10.1088/1742-6596/78/1/012085

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.
    DOI: 10.1088/1742-6596/46/1/053

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.
    10.1088/1742-6596/16/1/056

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
    DOI: 10.1063/1.1518191

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
    DOI: 10.1063/1.1518190

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.
   DOI: 10.1016/S0375-9474(01)00692-3

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.
   DOI: 10.1063/1.1419598

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.
   DOI: 10.1063/1.1419596

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.
   DOI: 10.1063/1.1405310

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.
   DOI: 10.1063/1.1405337

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

7. Horizons: Nuclear Astrophysics in the 2020s and Beyond,

   H. Schatz et al., 2022, Journal of Physics G Nuclear Physics, 49, 11, 110502
   DOI: 10.1088/1361-6471/ac8890

6. *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)

5. *Nuclear Physics Exascale Requirements Review: An Office of Science review sponsored jointly by Advanced Scientific Computing Research and Nuclear Physics,*

   J. Carlson et al. 2017, US Department of Energy, Washington, DC (United States). Advanced Scientific Computing Research and Nuclear Physics

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 et al. 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. Cavecchi, 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. Różańska, 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

10/09/2024 Invited speaker at APS-DNP 2024 meeting, Mini-Symposium: Nuclear Data in the Cosmos, *pynucastro: A python library for connecting nuclear data to astrophysical simulations*

09/13/2024 IReNA Online Seminar Series, *pynucastro: A python library connecting nuclear experiment data and astrophysics*

08/07/2024 Invited talk at the Rise_Time conference, Purdue University, *Modeling Astrophysical Reacting Flows*

07/30/2024 Modeling Talk seminar series at Google research / x.company, *The Challenges of Modeling Stellar Explosions*

07/04/2024 Invited talk at AstroNum 2024, La Rochelle, France, *Strong Coupling of Hydrodynamics and Reactions in Astrophysical Flows*

04/15/2024 Colloquium at Temple University, *Modeling Stellar Explosions*

03/06/2024 Invited minisymposium talk in the Performance Optimization for Multiphysics Applications on Structured Mesh with Particles minisymposium at the 2024 SIAM Conference on Parallel Processing for Scientific Computing, *Modeling Astrophysical Reactive Flows with Castro at the Exascale*

11/04/2023 Invited talk at APS-MAS, University of Delaware, *Engaging Students in Computational (Astro)Physics Courses and Research*

10/23/2023 Invited talk at the Interfaces and Mixing, Exploration Conference, 23-26 Oct 2023, Kavli Institute for Theoretical Physics, *Convective Mixing in Stellar Reactive Flows*

06/28/2023 Invited talk at AstroNum 2023–15th International Conference on Numerical Modeling of Space Plasma Flows, Pasadena, CA, USA, *Coupling Hydrodynamics and Astrophysical Reaction Networks*

11/21/2022 Invited talk in *Astrophysical Turbulence: Current Understanding and Modeling Challenges* minisymposium at the APS/Division of Fluid Dynamics 2022 meeting, *Modeling Astrophysics Reactions in Turbulent Environments*

11/14/2022 Invited talk a HPC session of the Computing Working Group at the Argonne Town Meeting on Nuclear Structure, Reactions, and Astrophysics, *Blowing Up Stars Over the Next Decade*

07/28/2022 Universiti Malaya (Kuala Lumpur, Malaysia), Department of Physics Colloquium, *Modeling Astrophysical Thermonuclear Explosions*

05/20/2022 FastMath seminar, *Algorithmic Improvements for Coupling Hydrodynamics and Reactions in Astrophysical Flows*

05/04/2022 Invited speaker in the AMReX Breakout Session of the 2022 ECP Annual Meeting, *Castro Developments for Exascale Platforms*

03/16/2022 Invited Focus Session Speaker in *Extreme-Scale Computational Science Discovery in Fluid Dynamics and Related Disciplines*, APS March Meeting, *The Challenges of Modeling Astrophysical Reactive Flows*

11/17/2021 Invited panelist for KITP Transport in Stars workshop on convection (KITP, Santa Barbara, CA)

10/19/2021 Astronomy Society of Ireland Colloquium, *The Challenges of Modeling Astrophysical Reactive Flows*

10/18/2021 Michigan State University, Department of Computational Mathematics, Science and Engineering Colloqium, *The Challenges of Modeling Astrophysical Reactive Flows*

03/02/2021 Invited talk in the *Computational Methods in Explosive Nuclear Astrophysics* session at the SIAM Computational Science and Engineering 2021 meeting, *Modeling Astrophysical Reacting Flows*

01/30/2020 Princeton University, Department of Astrophysical Sciences Thunch talk, *Modeling Stellar Explosions*

01/09/2020 Invited presentation at Texas Advanced Computing Center *Workshop on Future Directions in Extreme Scale Computing for Scientific Grand Challenges* on *Challenges in Modeling Astrophysical Thermonuclear Explosions*

11/06/2019 Stony Brook University, Department of Physics and Astronmomy Colloquium, *Modeling Thermonuclear X-ray Bursts*

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 meeting, *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, Univesity 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 Darthmouth, *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.