JAMES AUSTIN HARRIS *Curriculum vitae*

CONTACT INFORMATION

Computational Scientist
National Center for Computational Sciences
Oak Ridge National Laboratory
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RESEARCH INTERESTS

Nuclear Astrophysics: supernova ejecta and nucleosynthesis, core-collapse supernova explosion mechanism, formation and evolution of massive stars

Computational Astrophysics: nuclear reaction kinetics, spectral neutrino transport, astrophysical fluid dynamics

High-Performance Computing: hybrid architectures, code optimization and parallelization, computational strategies for exascale

EDUCATION

The University of Tennessee, Knoxville, TN
Ph.D. in Physics, Department of Physics & Astronomy August 2015
- Thesis title: *Nucleosynthesis in Self-Consistent Core-Collapse Supernova Models using Multidimensional Chimera Simulations*
- Thesis committee: Dr. William "Raph" Hix (adviser), Dr. O. E. "Bronson" Messer, Dr. Michael W. Guidry, Dr. Thomas Papenbrock, Dr. Jack Dongarra
- Area of study: Nuclear and computational Astrophysics
- Interdisciplinary Graduate Minor in Computational Science

M.S. in Physics, Department of Physics & Astronomy July 2012

Murray State University, Murray, KY
B.S. in Engineering Physics, Department of Engineering and Physics May 2009
- *Summa Cum Laude*
- Second major in Mathematics & Statistics

PROFESSIONAL EXPERIENCE

Computational Scientist January 2019 to present
Science Engagement, National Center for Computational Sciences, Oak Ridge National Laboratory
- Exascale Computing Project (ECP):
  - *ExaStar: Exascale Models of Stellar Explosions: Quintessential Multi-Physics Simulation*
  - PI: Dr. Daniel N. Kasen
- ORNL lead for OLCF-5 Scientific & Math Libraries
- INCITE co-PI: Long term simulations of core-collapse supernovae

Postdoctoral Research Associate April 2017 to December 2018
Science Engagement, National Center for Computational Sciences, Oak Ridge National Laboratory
- Supervisor: Dr. Judith Hill
- Mentor: Dr. O. E. "Bronson" Messer
- Center for Accelerated Application Readiness (CAAR) project:

- *Using FLASH for Astrophysics Simulations at an Unprecedented Scale*
- PI: Dr. O. E. "Bronson" Messer
- Utilize GPUs in the FLASH supernova code to enable increased physical fidelity and connect core-collapse supernova simulations to observational signatures

- Exascale Computing Project (ECP):
  - (*ExaStar*) Develop and implement shared multi-physics interfaces for FLASH5

Postdoctoral Research Fellow September 2015 to April 2017

Nuclear Science Division, Lawrence Berkeley National Laboratory

- Supervisors: Dr. Daniel N. Kasen, Dr. Wick C. Haxton
- Exascale Computing Project (ECP):
  - (*ExaStar*) Develop new software ecosystem to exploit exascale systems to provide ground-breaking simulations of stellar explosions
- Establish framework for extending supernova simulations with multiple codes
- Effects of mass loss on supernova progenitor structure and explosion dynamics

Graduate Research Assistant January 2011 to August 2015

Department of Physics & Astronomy, University of Tennessee

- Supervisors: Dr. William "Raph" Hix (August 2013–August 2015), Dr. O. E. "Bronson" Messer (May 2012–July 2013), Dr. Michael W. Guidry (January 2011–April 2012)
- Core-collapse supernova nucleosynthesis

AWARDS

2022 R&D 100 Winner: Flash-X, a Multiphysics Simulation Software

The University of Tennessee

- Paul Stelson Fellowship for Professional Promise, 2013

REFEREED PUBLICATIONS

[1] Rivas, F., **Harris, J. A.**, Hix, W. R., Messer, O. E. B. The Impact of Resolution on Double-Detonation Models for Type Ia Supernovae. *Astrophysical Journal*, 937, 2, 2022. doi:10.3847/1538-4357/ac8b06

[2] Dubey, A., Weide, K., O'Neal, J., Dhruv, A., Couch, S., **Harris, J. A.**, Klosterman, T., Jain, R., Rudi, J., Messer, O. E. .B., Pajkos, M., Carlson, J., Chu, R., Wahib, M., Chawdary, S., Ricker, P. M., Lee, D., Antypas, K., Riley, K. M., Daley, C., Ganapathy, M., Timmes, F. X., Townsley, D. M., Vanella, M., Bachan, J., Rich, P., Kumar, S., Endeve, E., Hix, W. R., Mezzacappa, A., Papatheodore, T. Flash-X: A multiphysics simulation software instrument. *SoftwareX*, 19, 101168, 2022. doi:10.1016/j.softx.2022.101168

[3] Sandoval, M. A., Hix, W. R., Messer, O. E. B., Lentz, E. J., **Harris, J. A.** Three-dimensional Core-collapse Supernova Simulations with 160 Isotopic Species Evolved to Shock Breakout. *Astrophysical Journal*, 921, 2, 113, 2021. doi:10.3847/1538-4357/ac1d49

[4] **Harris, J. A.**, Chu, R., Couch, S. M., Dubey, A., Endeve, E., Georgiadou, A., Jain, R., Kasen, D., Laiu, M. P., Messer, O. E. B., O'Neal, J., Sandoval, M. A., Weide, K. Exascale models of stellar explosions: Quintessential multi-physics

simulation. *International Journal of High Performance Computing Applications*, 2021. doi:10.1177/10943420211027937

[5] Laiu, M. P., Endeve, E., Chu, R., **Harris, J. A.**, Messer, O. E. B. A DG-IMEX method for two-moment neutrino transport: Nonlinear solvers for neutrino–matter coupling. *Astrophysical Journal Supplement*, 253, 2, 52, 2021. doi:10.3847/1538-4365/abe2a8

[6] Laiu, M. P., **Harris, J. A.**, Chu, R., Endeve, E. thornado-transport: Anderson- and GPU-accelerated nonlinear solvers for neutrino-matter coupling. *Journal of Physics: Conference Series*, 1623, 012013, 2020. doi:10.1088/1742-6596/1623/1/012013

[7] Mezzacappa, A., Marronetti, P., Landfield, R. E., Lentz, E. J., Yakunin, K. N., Bruenn, S. W., Hix, W. R., Messer, O. E. B., Endeve, E., Blondin, J. M., **Harris, J. A.** Gravitational wave signature of of a core-collapse supernova explosion of a 15 $M_\odot$ star. *Physical Review D*, 102, 023027, 2020. doi:10.1103/PhysRevD.102.023027

[8] Luo, L., Straatsma, T. P., Suarez, L. E. A., Broer, R., Bykov, D., D'Azevedo, E. F., Faraji, S. S., Gottiparthi, K. C., De Graaf, C., **Harris, J. A.**, Havenith, R. W. A., Jensen, H. J. .A., Joubert, W., Kathir, R. K., Larkin, J., Li, Y. W., Lyakh, D. I., Messer, O. E., B., Norman, M. R., Oefelein, J. C., Sankaran, R., Tillack, A. F., Barnes, A. L., Visscher, L., Wells, J. C., Wibowo, M. Pre-exascale accelerated application development: The ORNL Summit experience. *IBM Journal of Research & Development*, 64, 11, 2020. doi:10.1147/JRD.2020.2965881

[9] Cassanova, J., Endeve, E., Lentz, E. J., Messer, O. E., B., Hix, W. R., **Harris, J. A.**, Bruenn, S. W. On the character of turbulent-like flows in self-consistent models of core-collapse supernovae. *Physica Scripta*, 95, 6, 2020. doi:10.1088/1402-4896/ab7dd1

[10] Bruenn, S. W., Blondin, J. M., Hix, W. R., Lentz, E. J., Messer, O. E. B., Mezzacappa, A., Endeve, E., **Harris, J. A.**, Marronetti, P., Budiardja, R. D., Chertkow, M. A., Lee, C. -T. Chimera: A massively parallel code for core-collapse supernova simulation. *Astrophysical Journal Supplement*, 248, 11, 2020. doi:10.3847/1538-4365/ab7aff

[11] Dubey, A., Chawdhary, S., **Harris, J. A.**, Messer, O. E. B. Simulation Planning Using Component Based Cost Model. In: *2019 IEEE International Parallel and Distributed Processing Symposium Workshops (IPDPSW)*, Rio De Janeiro, Brazil, May 20–24, 2019. doi:10.1109/IPDPSW.2019.00116

[12] Hix, W. R., **Harris, J. A.**, Lentz, E. J., Bruenn, S. W., Messer, O. E. B., Mezzacappa, A. Learning about Nucleosynthesis from Multi-dimensional simulations of Core-Collapse Supernovae. In: *Proceedings of the 15th Symposium on Nuclei in the Cosmos (NIC 2018)*, L'Aquila, Italy, June 24–29, 2018. doi:10.1007/978-3-030-13876-9_19

[13] Messer, O. E. B., **Harris, J. A.**, Hix, W. R., Lentz, E. J., Bruenn, S. W., Mezzacappa, A. Multi-dimensional Simulations of Core-collapse Supernova Explosions

with CHIMERA. In: *Proceedings of the 14th International Symposium on Origin of Matter and Evolution of Galaxies (OMEG 2017)*, Daejeon, Korea, June 27–30, 2017. *AIP Conference Proceedings*, 1947, 020017, 2018. doi:10.1063/1.5030821

[14] Sieverding, A., Martínez-Pinedo, G., Langanke, K., **Harris, J. A.**, Hix, W. R. The ν process in the innermost supernova ejecta. In: *Proceedings of the 8th International Conference of Nuclear Physics in Astrophysics (NPA8 2017)*, Catania, Italy, June 18–23, 2017. *EPJ Web of Conferences*, 165, 01045, 2017. doi:10.1051/epjconf/201716501045

[15] Yakunin, K. N., Endeve, E., Mezzacappa, A., Szczpanczyk, M., Zanolin, M., Marronetti, P., Lentz, E. J., Bruenn, S. W., Hix, W. R., Messer, O. E. B., Blondin, J. M., **Harris, J. A.** Gravitational wave signals from multi-dimensional core-collapse supernova explosion simulations. In: *Proceedings of the 52nd Rencontres de Moriond on Gravitation (Moriond Gravitation 2017)*, La Thuile, Italy, March 25–April 1, 2017. C17-03-25, p.37-42

[16] **Harris, J. A.**, Hix, W. R., Chertkow, M. A., Lee, C. -T., Lentz, E. J., Messer, O. E. B. Implications for Post-Processing Nucleosynthesis of Core-Collapse Supernova Models with Lagrangian Particles. *Astrophysical Journal*, 843, 2, 2017. doi:10.3847/1538-4357/aa76de

[17] Hix, W. R., **Harris, J. A.** The Multidimensional Character of Nucleosynthesis in Core-Collapse Supernovae. *Handbook of Supernovae*, 2016. doi:10.1007/978-3-319-20794-0_77-1

[18] Bruenn, S. W., Lentz, E. J., Hix, W. R., Mezzacappa, A., **Harris, J. A.**, Messer, O. E. B., Endeve, E., Blondin, J. M., Chertkow, M. A., Lingerfelt, E. J., Marronetti, P., Yakunin, K. N. Development of Explosions in Axisymmetric Ab Initio Core-Collapse Supernova Simulations of 12-25 $M_\odot$ Stars. *Astrophysical Journal*, 818, 123, 2016. doi:10.3847/0004-637X/818/2/123

[19] Hix, W. R., Lentz, E. J., Bruenn, S. W., Mezzacappa, A., Messer, O. E. B., Endeve, E., Blondin, J. M., **Harris, J. A.**, Marronetti, P., Yakunin, K. N. The Multi-dimensional Character of Core-collapse Supernovae. In: *Proceedings of the 34th Mazurian Lakes Conference on Physics (MLCP 2015)*, Piaski, Poland, September 6–13, 2015. *Acta Physica Polonica B*, 47, 645, 2016. doi:10.5506/APhysPolB.47.645

[20] Yakunin, K. N., Mezzacappa, A., Marronetti, P., Yoshida, S., Bruenn, S. W., Hix, W. R., Lentz, E. J., Messer, O. E.., **Harris, J. A.**, Endeve, E., Blondin, J. M., Lingerfelt, E. J. Gravitational wave signatures of ab initio two-dimensional core collapse supernova explosion models for 12-25 $M_\odot$ stars. *Physical Review D*, 92, 084040, 2015. doi:10.1103/PhysRevD.92.084040

[21] Mezzacappa, A., Bruenn, S. W., Lentz, E. J., Hix, W. R., Messer, O. E. B., **Harris, J. A.**, Lingerfelt, E. J., Endeve, E., Yakunin, K. N., Blondin, J. M., Marronetti, P. A Three-Dimensional Neutrino-Driven Core Collapse Supernova Explosion of a 15 $M_\odot$ Star. In: *Proceedings of the 9th Annual International Conference on Numerical Modeling of Space Plasma Flows (ASTRONUM 2014)*, Long Beach, CA, June 23–27, 2014. *ASP Conference Series*, 498, 108, 2015. ASPC:498-0108

[22] Lentz, E. J., Bruenn, S. W., Hix, W. R., Mezzacappa, A., Messer, O. E. B., Endeve, E., Blondin, J. M., **Harris, J. A.**, Blondin, J. M., Marronetti, P., Yakunin, K. N. Three-dimensional Core-collapse Supernova Simulated Using a 15 $M_{\odot}$ Progenitor. *Astrophysical Journal Letters*, 807, L31, 2015. doi:10.1088/2041-8205/807/2/L31

[23] Mezzacappa, A., Bruenn, S. W., Lentz, E. J., Hix, W. R., **Harris, J. A.**, Messer, O. E. B., Endeve, E., Chertkow, M. A., Blondin, J. M., Marronetti, P., Yakunin, K. N. Recent Progress on Ascertaining the Core Collapse Supernova Explosion Mechanism. In: *Proceedings of the 32nd International Symposium on Lattice Field Theory (LATTICE2014)*, New York, NY, June 23–28, 2014. doi:10.22323/1.214.0010

[24] Mezzacappa, A., Bruenn, S. W., Lentz, E. J., Hix, W. R., Messer, O. E. B., **Harris, J. A.**, Lingerfelt, E. J., Endeve, E., Yakunin, K. N., Blondin, J. M., Marronetti, P. Two- and Three-Dimensional Multi-Physics Simulations of Core Collapse Supernovae: A Brief Status Report and Summary of Results from the "Oak Ridge" Group. In: *Proceedings of the 8th Annual International Conference on Numerical Modeling of Space Plasma Flows (ASTRONUM 2013)*, Biarritz, France, July 1–5, 2013. *ASP Conference Series*, 488, 102, 2014. ASPC:488-0102

[25] Hix, W. R., Lentz, E. J., Endeve, E., Baird, M., Chertkow, M. A., **Harris, J. A.**, Messer, O. E., Mezzacappa, A., Bruenn, S., Blondin, J. Essential ingredients in core-collapse supernovae. *AIP Advances*, 4, 041013, 2014. doi:10.1063/1.4870009

[26] **Harris, J. A.**, Hix, W. R., Chertkow, M. A., Bruenn, S. W., Lentz, E. J., Messer, O. E. B., Mezzacappa, A., Blondin, J. M., Marronetti, P. Yakunin, K. N. Advancing Nucleosynthesis in Self-consistent, Multidimensional Models of Core-Collapse Supernovae. In: *Proceedings of the 13th Symposium on Nuclei in the Cosmos (NIC 2014)*, Debrecen, Hungary, July 7–11, 2014. doi:10.22323/1.204.0099

[27] Hix, W. R., **Harris, J. A.**, Lentz, E. J., Bruenn, S. W., Chertkow, M. A., Messer, O. E. B., Mezzacappa, A., Blondin, J. M., Endeve, E., Marronetti, P. Yakunin, K. N. Multidimensional simulations of core-collapse supernovae and implications for nucleosynthesis. In: *Proceedings of the 13th Symposium on Nuclei in the Cosmos (NIC 2014)*, Debrecen, Hungary, July 7–11, 2014. doi:10.22323/1.204.0019

[28] Dong, T., Haidar, A., Luszczek, P., **Harris, J. A.**, Tomov, S., Dongarra, J. LU Factorization of Small Matrices: Accelerating Batched DGETRF on the GPU. In: *Proceedings of the 16th IEEE International Conference on High Performance Computing and Communications (HPCC 2014)*, Paris, France, August 20–22, 2014. *High Performance Computing and Communications*, 157, 2014. doi:10.1109/HPCC.2014.30

[29] Guidry, M. W. and **Harris, J. A.** Explicit Integration of Extremely-Stiff Reaction Networks: Quasi-Steady-State Methods. *Computational Science & Discovery*, 6, 015002, 2013. doi:10.1088/1749-4699/6/1/015002

[30] Messer, O. E. B., **Harris, J. A.**, Parete-Koon, S., Chertkow, M. A. Multicore and Accelerator Development for a Leadership-Class Stellar Astrophysics Code. In: *Proceedings of the 11th International Conference on Applied Parallel and Scientific Computing (PARA 2012)*, Helsinki, Finland, June 10–13, 2012. *Lecture Notes in Computer Science*, 7782, 92, 2013. doi:10.1007/978-3-642-36803-5_6

[31] Lentz, E. J., Bruenn, S. W., **Harris, J. A.**, Chertkow, M. A., Hix, W. R., Mezzacappa, A., Messer, O. E. B., Blondin, J. M., Marronetti, P., Mauney, C. M., Yakunin, K. N. Two- and three-dimensional simulations of core-collapse supernovae with CHIMERA. In: *Proceedings of the 12th Symposium on Nuclei in the Cosmos (NIC 2012)*, Cairns, Australia, August 5–12, 2012. doi:10.22323/1.146.0208

INVITED TALKS

[32] **Harris, J. A.** Introduction to GPU Computing Presented at: *3rd JETSCAPE Winter School and Workshop*, Knoxville, TN, March 16–20, 2020

[33] **Harris, J. A.** The multidimensional character of nucleosynthesis in core-collapse supernovae. Presented at: *University of Minnessota Nuclear Physics Seminar*, Minneapolis, MN, March 28, 2019

[34] **Harris, J. A.** The multi-D character of nucleosynthesis in core-collapse supernovae. Presented at: *Microphysics in Computational Relativistic Astrophysics 2017 (MICRA 2017)*, East Lansing, MI, July 17–21, 2017

[35] **Harris, J. A.**, Hix, W. R., Bruenn, S. W., Lentz, E. J., Messer, O. E. B., Mezzacappa, A. Predicting nucleosynthesis observables in CCSNe with self-consistent simulations. Presented at: *F. O. E. Fifty-One Erg: International conference on the physics and observations of sueprnovae and supernova remnants (FOE 2015)*, Raleigh, NC, June 1–5, 2015

CONTRIBUTED TALKS AND POSTERS

[36] **Harris, J. A.**, Endeve, E. thornado: a GPU-optimized application for spectral neutrino transport using OpenACC and OpenMP. Presented at: *OpenACC and Hackathons Summit 2022*, Online Virtual Meeting, August 2–4, 2022

[37] **Harris, J. A.**, Laiu, M. P., Chu, R., Endeve, E. OpenMP BOF - Early Experience: thornado (ExaStar). Presented at: *ECP Annual Meeting 2022*, Online Virtual Meeting, May 2–6, 2022

[38] **Harris, J. A.**, Laiu, M. P., Chu, R., Endeve, E. OpenMP BOF - Early Experience: thornado (ExaStar). Presented at: *ECP Annual Meeting 2021*, Online Virtual Meeting, April 12–16, 2021

[39] **Harris, J. A.**, Laiu, M. P., Chu, R., Endeve, E. OpenMP BOF - Early Experience: thornado (ExaStar). Presented at: *ECP Annual Meeting 2020*, Houston, TX, February 3–7, 2020

[40] **Harris, J. A.** Summit Experiences and Lessons Learned. Presented at: *AMD PathForward Deep Dive*, Austin, TX, September 17–19, 2019

[41] **Harris, J. A.** Towards Exascale Simulations of Stellar Explosions with FLASH. Presented at: *Supercomputing Conference 2018*, Dallas, TX, November 11–16, 2018

[42] **Harris, J. A.** Accelerated Simulations of Stellar Explosions with FLASH: Towards Exascale Capability. Presented at: *GPU Technology Conference 2018*, San Jose, CA, March 26–29, 2018. S8926

[43] Stevenson, T., Ohstrom, V., **Harris, J. A.**, Hix, W. R. Nucleosynthesis in Core-Collapse Supernovae. Poster presented at: *231st Meeting of the American Astronomical Society*, Washington D. C., January 8–12, 2018. 446.02

[44] Klion, H., Messer, O. E. B., **Harris, J. A.**, Papatheodore, T. Optimizing Gravity and Nuclear Physics in FLASH for Exascale. Poster presented at: *Supercomputing Conference 2017*, Denver, CO, November 12–17, 2017. P26

[45] Yakunin, K., Mezzacappa, A., Marronetti, P., Lentz, E. J., Bruenn, S. W., Hix, W. R., Messer, O. E. B., Endeve, E., Blondin, J. M., **Harris, J. A.** Gravitational Wave Signals from Core-Collapse Supernova Explosions. Presented at: *American Physical Society April Meeting 2017*, Washington, DC, January 28–31, 2017. C3.00002

[46] Elliot, C., Hix, W. R., **Harris, J. A.**, Manneschmidt, A. Nucleosynthesis in Type II Supernova Explosions. Poster presented at: *2016 Fall Meeting of the APS Division of Nuclear Physics*, Vancouver, Canada, October 13–16, 2016. EA.00123

[47] **Harris, J. A.**, Hix, W. R., Chertkow, M. A., Bruenn, S. W., Lentz, E. J., and Kasen, D. Nucleosynthesis in self-consistent, multi-dimensional simulations of CCSNe. Poster presented at: *American Physical Society April Meeting 2016*, Salt Lake City, UT, April 16–19, 2016. L1.00011

[48] Yakunin, K., Mezzacappa, A., Marronetti, P., Bruenn, S. W., Hix, W. R., Lentz, E. J., Messer, O. E. B., **Harris, J. A.**, Endeve, E., Blondin, J. M. Gravitational Wave Signals from 2D and 3D Core Collapse Supernova Explosions. Presented at: *American Physical Society April Meeting 2016*, Salt Lake City, UT, April 16–19, 2016. H15.00008

[49] **Harris, J. A.**, Hix, W. R., Chertkow, M. A., Bruenn, S. W., Lentz, E. J., Messer, O. E. B., Mezzacappa, A., Blondin, J. M., Marronetti, P., Yakunin, K. N. Nucleosynthesis in Axisymmetric Ab Initio Core-Collapse Supernova Simulations of 12-25 $M_{\odot}$ Stars. Presented at: *225th Meeting of the American Astronomical Society*, Seattle, WA, January 4–8, 2015. 121.07D

[50] Lentz, E. J., Bruenn, S. W., Hix, W. R., Messer, O. E. B., Mezzacappa, A., Blondin, J. M., Endeve, E., **Harris, J. A.**, Marronetti, P., Yakunin, K. Impact of the third dimension on simulations of core-collapse supernovae. Presented at: *225th Meeting of the American Astronomical Society*, Seattle, WA, January 4–8, 2015. 121.08

[51] **Harris, J. A.**, Hix, W. R., Chertkow, M. A., Bruenn, S. W., Lentz, E. J., Messer, O. E. B., Mezzacappa, A., Blondin, J. M., Marronetti, P., Yakunin, K. N. Nucleosynthesis in Multi-D Models of Core-Collapse Supernovae. Presented at: *2014 International Summer School on AstroComputing (ISSAC 2014)*, San Diego, CA, July 21–August 1, 2014

[52] **Harris, J. A.**, Hix, W. R., Chertkow, M. A., Bruenn, S. W., Lentz, E. J., Messer, O. E. B., Mezzacappa, A., Blondin, J. M., Marronetti, P., Yakunin, K. N. Advancing Nucleosynthesis in Core-Collapse Supernova Models Using 2D CHIMERA Simulations. Poster presented at: *223rd Meeting of the American Astronomical Society*, Washington D. C., January 5–9, 2014. 354.07

[53] Lentz, E. J., Bruenn, S. W., Yakunin, K., Endeve, E., Blondin, J. M., **Harris, J. A.**, Hix, W. R., Marronetti, P., Messer, O. E. B., Mezzacappa, A. Multidimensional simulations of core-collapse supernovae with CHIMERA. Poster presented at: *223rd Meeting of the American Astronomical Society*, Washington D. C., January 5–9, 2014. 354.08

[54] Yakunin, K., Marronetti, P., Messer, O. E. B., Mezzacappa, A., Lentz, E. J., Bruenn, S. W., Hix, W. R., **Harris, J. A.**, Blondin, J. M. 3D Core-Collapse Supernova Models: Gravitational and Neutrino Signatures. Poster presented at: *223rd Meeting of the American Astronomical Society*, Washington D. C., January 5–9, 2014. 354.09

[55] **Harris, J. A.**, Hix, W. R., Bruenn, S. W., Lentz, E. J., Messer, O. E. B., Mezzacappa, A. Towards Realistic Nucleosynthesis in Core-collapse Supernova Simulations. Poster presented at: *F. O. E. Fifty-One Erg (FOE 2013)*, Raleigh, NC, May 13–17, 2013

Student Advising

Ran Chu
Graduate student in Physics, University of Tennessee; neutrino transport in core-collapse supernovae. Primary adviser: Dr. Eirk Endeve. 2019–present.

Fernando Rivas
Graduate student in Physics, University of Tennessee; helium-shell, double-detonation supernova models. Primary adviser: Dr. Bronson Messer. 2017–present.

Michael Sandoval
Graduate student in Physics, University of Tennessee; extending supernova explosions to the stellar surface. Primary adviser: Dr. William "Raph" Hix. 2017–2021.

Hannah Klion
Graduate student in Physics, University of California, Berkeley; optimizing gravity and nuclear physics in FLASH. Primary adviser: Dr. Bronson Messer. Summer 2017.

Viktoria Ohstrom
Undergraduate student in Physics, University of Tennessee; nucleosynthesis in core-collapse supernovae. Primary adviser: Dr. William "Raph" Hix. Summer 2017.

Taylor Stevenson
Undergraduate student in Physics, University of Tennessee; nucleosynthesis in core-collapse supernovae. Primary adviser: Dr. William "Raph" Hix. Summer 2017.

Amos Manneschmidt
Undergraduate student in Physics, University of Tennessee; visualizing supernova nucleosynthesis. Primary adviser: Dr. William "Raph" Hix. Summer 2014.

PROFESSIONAL ACTIVITIES

Referee for AAS Journals (*ApJ*, *ApJL*, *ApJS*)
Refereee for *MNRAS*
NVIDIA GPU Hackathon Mentor, 2018–present

TECHNICAL SKILLS

Code contributions:

- CASTRO
  - GitHub: https://github.com/AMReX-Astro/Castro
- CHIMERA
- FLASH-X
  - GitHub: https://github.com/Flash-X
- THORNADO
  - GitHub: https://github.com/endeve/thornado
- WEAKLIB
  - GitHub: https://github.com/starkiller-astro/weaklib
- XNET
  - GitHub: https://github.com/starkiller-astro/XNet

Computer Programming:

- Fortran, C, Python, UNIX shell scripting, GNU Make

High-Performance Computing:

- CUDA, HIP, MPI, OpenMP, OpenACC, MAGMA, HDF5

Visualization Software:

- FFmpeg, gnuplot, MATLAB, VisIt