David Radice

Curriculum Vitæ • October 4, 2023

Department of Physics
104 Davey Lab, Box 133
The Pennsylvania State University
University Park, PA 16802-6300, USA

david.radice@psu.edu
http://personal.psu.edu/dur566/
Phone: +1 (609) 933 4609
Fax: +1 (814) 863 9608

Education

2010 – 2013 | **PhD in Gravitational Wave Astronomy**
Max Planck Institute for Gravitational Physics
Leibniz Universität Hannover

Supervisor	Prof. Luciano Rezzolla, rezzolla@th.physik.uni-frankfurt.de
	Prof. Bernard F. Schutz, bernard.schutz@aei.mpg.de
Thesis title	*Advanced Numerical Approaches in the Dynamics of Relativistic Flows*
Graduation	Nov. 18, 2013
Grade	Summa cum laude

2006 – 2009 | **Master's degree in Mathematical Engineering**
Department of Mathematics, Politecnico di Milano

Supervisors	Prof. Luciano Rezzolla rezzolla@th.physik.uni-frankfurt.de
	Prof. Giulio Magli, giulio.magli@polimi.it
Thesis title	*Numerical Simulations of Critical Phenomena in Neutron Star Collapse*
Graduation	Dec. 23, 2009
Grade	110/110 cum laude

2003 – 2006 | **Bachelor's degree in Mathematical Engineering**
Department of Mathematics, Politecnico di Milano

Supervisor	Prof. Alessandro Veneziani, ale@mathcs.emory.edu
Thesis title	*Analisi numerica di un nuovo modello di traffico automobilistico* (Numerical Analysis of a New Model of Traffic Flow)
Graduation	Sept. 27, 2006
Grade	108/110

Experience

Aug. 2019 – | **Assistant Professor of Physics**
Institute for Gravitation and the Cosmos
The Pennsylvania State University

- First neutron star merger simulations capturing non-equilibrium neutrino-matter interaction in full general relativity [24, 19, 14].
- Study of the nuclear physics implications of prompt collapse binary neutron star mergers [27, 22].
- Systematic investigation of the impact of QCD phase transition on the multimessenger signature of binary neutron star mergers [32, 15].
- Developer of the next-generation numerical relativity code `GRAthena++` [35].
- First targeted numerical relativity simulations of GW170817 and GW190425 including microphysics and neutrinos [41, 20].
- First study showing the impact of spiral density waves in the postmerger evolution of binary neutron star mergers [54].

Sept. 2016 – Aug. 2019

Associate Research Scholar
Max Planck/Princeton Center for Plasma Astrophysics
Department of Astrophysical Sciences
Princeton University
MENTOR: Prof. Adam Burrows

Member
School of Natural Sciences
Institute for Advanced Study

- First characterization of both the frequency and the amplitude of the gravitational wave signal from core-collapse supernovae using a large family of ab-initio three-dimensional simulations [60].
- First study showing that neutron star mergers could potentially be the source of the positrons producing the 511 keV emission line from the galactic center [61].
- First study to combine gravitational-waves and electromagnetic observations of GW170817 with simulations to derive a joint constraint on the tidal deformability of neutron stars [1, 62].
- First general-relativistic large-eddy simulation of neutron star mergers [76].
- Ab-initio, long-term simulations of low-mass core-collapse supernova explosions with sophisticated microphysics [77].
- First study of the impact and detectability of phase-transitions in the post-merger gravitational wave signal from coalescing neutron stars [78].

Oct. 2013 – Aug. 2016

Walter Burke Fellow in Theoretical Astrophysics and Relativity
Division of Physics, Mathematics and Astronomy
California Institute of Technology
MENTOR: Prof. Christian D. Ott

- First study of the one-armed spiral instability in quasi-circular binary neutron star mergers [82].
- Systematic study of the dynamical mass ejection from neutron star mergers, its nucleosynthetic yields, and its electromagnetic signatures [3].
- First study of the energy radiated in gravitational waves by merging neutron star [83].
- Highest-resolution simulation of neutrino-driven convection in core-collapse supernovae and first simulation to resolve the turbulent cascade [84].
- Discovery of a large-scale dynamo driven by the magnetorotational instability in magnetized, rotating, core-collapse supernovae [4].
- Study of the role of turbulence in the explosion of core-collapse supernovae and the impact of finite-resolution effects in simulations [86, 87].

Jan. 2010 – Sept. 2013

Graduate Student in Gravitational Wave Astronomy
Numerical Relativity Group
Max Planck Institute for Gravitational Physics
SUPERVISORS: Prof. Luciano Rezzolla and Prof. Bernard F. Schutz

- First higher-than-second-order accurate simulation of tidal effects in the late-inspiral of binary neutron star mergers [89].
- Development of the general-relativistic hydrodynamics code `WhiskyTHC`, currently used by several group (Frankfurt, Jena, PSU) to perform neutron star merger simulations [88, 89, 92].
- Design of a new method for radiation transport generalizing and extending popular moment schemes [90].
- First numerical study of the properties of relativistic turbulence [91].
- First general-relativistic hydrodynamics code using discontinuous Galerkin methods, now adopted by several groups (Caltech/Cornell, Frankfurt, Jena) [92].

Apr. 2009 – Dec. 2009 | **Undergraduate Research Fellow**
Numerical Relativity Group
Max Planck Institute for Gravitational Physics
SUPERVISORS: Prof. Luciano Rezzolla and Prof. Giulio Magli

Study of "phase transitions" in families of solutions of the Einstein equations describing fluid bodies at the verge of collapse to black hole [94, 95].

Honors and Awards

Jan. 2023 | **Dean's Climate and Diversity Award**
Penn State's Eberly College of Science

Feb. 2022 | **Sloan Research Fellowship**
Alfred P. Sloan Foundation

Jun. 2020 | **Early Career Research Program Award**
Department of Energy

Nov. 2014 | **Giulio Rampa Thesis Prize for Outstanding Research in Mathematical or Numerical General Relativity**
University of Pavia

Oct. 2013 | **Prize Postroctoral Fellowship in Theoretical Physics and Astrophysics**
California Institute of Technology

Professional Memberships

- Sigma-Xi Member 2020
- Member of the American Physical Society since 2014
- Member of the American Physical Society Division of Gravitational Physics since 2014

Top Five Publications

88 peer-reviewed publications, **6422** citations, h-index **47** (source NASA ADS, retrieved September 4, 2023).

[1] **D. Radice**, A. Perego, F. Zappa, and S. Bernuzzi. *GW170817: Joint Constraint on the Neutron Star Equation of State from Multimessenger Observations*, The Astrophysical Journal Letters **852**, L29 (2018), `arXiv:1711.03647`. [**453 citations**]

[2] **D. Radice**, A. Perego, K. Hotokezaka, S. A. Fromm, S. Bernuzzi, and L. F. Roberts. *Binary Neutron Star Mergers: Mass Ejection, Electromagnetic Counterparts and Nucleosynthesis*, The Astrophysical Journal **869**, 130 (2018), `arXiv:1809.11161`. [**322 citations**]

[3] **D. Radice**, F. Galeazzi, J. Lippuner, L. F. Roberts, C. D. Ott, and L. Rezzolla. *Dynamical Mass Ejection from Binary Neutron Star Mergers*, Monthly Notices of the Royal Astronomical Society **460**, 3255 (2016), arXiv:1601.02426. [**300 citations**]

[4] P. Mösta, C. D. Ott, **D. Radice**, L. Roberts, E. Schnetter, and R. Haas. *A Large Scale Dynamo and Magneto-turbulence in Rapidly Rotating Core-Collapse Supernovae*, Nature **528**, 376 (2015), https://dx.doi.org/10.1038/nature15755. [**221 citations**]

[5] A. Perego, **D. Radice**, and S. Bernuzzi. *AT2017gfo: an anisotropic and three-component kilonova counterpart of GW170817*, The Astrophysical Journal Letters **850**, L37 (2017), arXiv:1711.03982. [**208 citations**]

Other Publications

[6] **D. Radice**, G. Ricigliano, M. Bhattacharya, A. Perego, F. J. Fattoyev, K. Murase, *What if GW190425 did not produce a black hole promptly?*, arXiv:2309.15195

[7] S. Kulkarni, S. Padamata, A. Gupta, **D. Radice**, and R. Kashyap, *Numerical Relativity Estimates of the Remnant Recoil Velocity in Binary Neutron Star Mergers*, arXiv:2308.03955

[8] T. Andrade, J. Trenado, S. Albanesi, R. Gamba, S. Bernuzzi, A. Nagar, J. Calderon-Bustillo, N. Sanchis-Gual, J. A. Font, W. Cook, B. Daszuta, F. Zappa, and **D. Radice**, *Towards Numerical-Relativity Informed Effective-One-Body Waveforms for Dynamical Capture Black Hole Binaries*, arXiv:2307.08697

[9] **D. Radice** and S. Bernuzzi, *Ab-Initio General-Relativistic Neutrino-Radiation Hydrodynamics Simulations of Long-Lived Neutron Star Merger Remnants to Neutrino Cooling Timescales*, arXiv:2306.13709

[10] A. Dhani, **D. Radice**, J. Schütte-Engel, S. Gardner, B. Sathyaprakash, D. Logoteta, A. Perego, and R. Kashyap, *Prospects for Direct Detection of Black Hole Formation in Neutron Star Mergers with Next-Generation Gravitational-Wave Detectors*, arXiv:2306.06177

[11] L. F. L. Micchi, **D. Radice**, and C. Chirenti, *Multimessenger Emission from the Accretion Induced Collapse of White Dwarfs*, Monthly Notices of the Royal Astronomical Society **525**, 6359 (2023), arXiv:2306.04711

[12] S. Curtis, P. Bosch, P. Mösta, **D. Radice**, S. Bernuzzi, A. Perego, R. Haas, and E. Schnetter, *Outflows from Short-Lived Neutron-Star Merger Remnants Can Produce a Blue Kilonova*, arXiv:2305.07738

[13] M. C. Rodriguez, Ignacio F. Ranea-Sandoval, C. Chirenti, and **D. Radice**, *Three Approaches for the Classification of Protoneutron Star Oscillation Modes*, Monthly Notices of the Royal Astronomical Society **523**, 2236 (2023), arXiv:2304.00033

[14] J. Fields, A. Prakash, M. Breschi, **D. Radice**, S. Bernuzzi, and A. Schneider, *Thermal Effects in Binary Neutron Star Mergers*, The Astrophysical Journal Letters **952**, L36 (2023), arXiv:2302.11359

[15] P. Espino, A. Prakash, **D. Radice**, D. Logoteta, *Revealing Phase Transition in Dense Matter with Gravitational Wave Spectroscopy of Binary Neutron Star Mergers*, arXiv:2301.03619

[16] A. Bandopadhyay, B. Reed, S. Padamata, E. Leon, C. J. Horowitz, D. A. Brown, **D. Radice**, F. J. Fattoyev, J. Piekarewicz, *Detectability of Sub-Solar Mass Neutron Stars Through a Template Bank Search*, Physical Review D **107**, 103012 (2023), arXiv:2212.03855

[17] M. K. Bhattacharyya, **D. Radice**, *A Finite Element Method for Angular Discretization of the Radiation Transport Equation on Spherical Geodesic Grids*, Journal of Computational Physics **491**, 112365 (2023), arXiv:2212.01409

[18] A. Gonzalez, F. Zappa, M. Berschi, S. Bernuzzi, **D. Radice**, A. Adhikari, A. Camilletti, S. V. Chaurasia, G. Doulis, S. Padamata, A. Rashti, M. Ujevic, B. Brügmann, W. Cook, T. Dietrich, A. Perego, A. Poudel, W. Tichy, *Second Release of the CoRe Database of Binary Neutron Star Merger Waveforms*, Classical and Quantum Gravity **40**, 085011 (2023), arXiv:2210.16366

[19] F. Zappa, S. Bernuzzi, **D. Radice**, and A. Perego, *Binary Neutron Star Merger Simulations with Neutrino Transport and Turbulent Viscosity: Impact of Different Schemes and Grid Resolution*, Monthly Notices of the Royal Astronomical Society **520**, 1481 (2023), arXiv:2210.11491

[20] A. Camilletti, L. Chiesa, G. Ricigliano, A. Perego, L. C. Lippold, S. Padamata, S. Bernuzzi, **D. Radice**, D. Logoteta, and F. M. Guercilena. *Numerical relativity simulations of the neutron star merger GW190425: microphysics and mass ratio effects*, Monthly Notices of the Royal Astronomical Society **516**, 4760 (2022), arXiv:2204.05336

[21] M. Ryan, **D. Radice**. *Exotic Compact Objects: The Dark White Dwarf*, Physical Review D **105**, 115034 (2022), arXiv:2201.05626

[22] A. Perego, D. Logoteta, **D. Radice**, S. Bernuzzi, R. Kashyap, A. Das, S. Padamata, A. Prakash. *Probing The Incompressibility of Nuclear Matter at Ultra-High Density Through the Prompt Collapse of Asymmetric Neutron Star Binaries*, Physical Review Letters **129**, 032701 (2022), arXiv:2111.05864

[23] S. Curtis, P. Mösta, Z. Wu, **D. Radice**, L. Roberts, G. Ricignano, and A. Perego. *r-process Nucleosynthesis and Kilonovae from Hypermassive Neutron Star Remnants*, Monthly Notices of the Royal Astronomical Society **518**, 5313 (20222), arXiv:2112.00772

[24] **D. Radice**, S. Bernuzzi, A. Perego, and R. Haas. *A New Moment-Based General-Relativistic Neutrino-Radiation Transport Code: Methods and First Applications to Neutron Star Mergers*, Monthly Notices of the Royal Astronomical Society, **512**, 1499 (2022), arXiv:2111.14858

[25] M. Cusinato, F. M. Guercilena, A. Perego, D. Logoteta, **D. Radice**, S. Bernuzzi, and S. Ansoldi. *Neutrino Emission From Binary Neutron Star Mergers: Characterizing Light Curves And Mean Energies*, The European Physical Journal A **58**, 99 (2022), arXiv:2111.13005

[26] Z. Wu, G. Ricigliano, R. Kashyap, A. Perego, and **D. Radice**. *Radiation Hydrodynamics Modeling of Kilonovae with SNEC*, Monthly Notices of the Royal Astronomical Society **512**, 328 (2022), arXiv:2111.06870

[27] R. Kashyap, A. Das, **D. Radice**, S. Padamata, A. Prakash, D. Logoteta, A. Perego, D. A. Godzieba, S. Bernuzzi, I. Bombaci, F. J. Fattoyev, B. T. Reed, and A. Schneider. *Numerical Relativity Simulations Of Prompt Collapse Mergers: Threshold Mass And Phenomenological Constraints On Neutron Star Properties After GW170817*, Physical Review D **105**, 103022 (2022), arXiv:2111.05183

[28] M. Breschi, S. Bernuzzi, D. Godzieba, A. Perego, **D. Radice**. *Constraints on the maximum densities of neutron stars from postmerger gravitational waves with third-generation observations*, Physical Review Letters **128**, 161102 (2022), arXiv:2110.06957

[29] T. Dieselhorst, W. Cook, S. Bernuzzi, and **D. Radice**. *Machine Learning for Conservative-to-Primitive in Relativistic Hydrodynamics*, Symmetry **13**, 2157 (2021), arXiv:2109.02679

[30] D. Godzieba and **D. Radice**. *High-Order Multipole and Binary Love Number Universal Relations*, Universe **7**, 368 (2021), arXiv:2109.01159

[31] A. Sur, W. Cook, **D. Radice**, B. Haskell, S. Bernuzzi. *Long-Term GRMHD Simulations of Magnetic Field in Isolated Neutron Stars*, Monthly Notices of the Royal Astronomical Society **511**, 3983 (2022), arXiv:2108.11858

[32] A. Prakash, **D. Radice**, D. Logoteta, A. Perego, V. Nedora, I. Bombaci, R. Kashyap, S. Bernuzzi, and A. Endrizzi. *Signatures of Deconfined Quark Phases in Binary Neutron Star Mergers*, Physical Review D **104**, 083029 (2021), arXiv:2106.07885

[33] V. Nedora, **D. Radice**, S. Bernuzzi, A. Perego, B. Daszuta, A. Endrizzi, A. Prakash, and F. Schianchi. *Dynamical Ejecta Synchrotron Emission as Possible Contributor to the Rebrightening of GRB170817A*, Monthly Notices of the Royal Astronomical Society **506**, 5908 (2021), arXiv:2104.04537

[34] A. Hajela, R. Margutti, J. S. Bright, K. D. Alexander, B. D. Metzger, V. Nedora, A. Kathirgamaraju, B. Margalit, **D. Radice**, E. Berger, A. MacFadyen, D. Giannios, R. Chornock, I. Heywood, L. Sironi, O. Gottlieb, D. Coppejans, T. Laskar, Y. Cendes, R. Barniol Duran, T. Eftekhari, W. Fong, A. McDowell, M. Nicholl, X. Xie, J. Zrake, S. Bernuzzi, F. S. Broekgaarden, C. D. Kilpatrick, G. Terreran, V. A. Villar, P. K. Blanchard, S. Gomez, G. Hosseinzadeh, D. J. Matthews, and J. C. Rastinejad. *The Emergence Of A New Source Of X-Rays From The Binary Neutron Star Merger GW170817*, The Astrophysical Journal Letters **927**, L17 (2022), arXiv:2104.02070

[35] B. Daszuta, F. Zappa, W. Cook, **D. Radice**, S. Bernuzzi, and V. Morozova. *GRAthena++: Puncture Evolutions on Vertex-Centered Oct-Tree AMR*, The Astrophysical Journal Supplement Series **257**, 25 (2021), arXiv:2101.08289

[36] M. Breschi, A. Perego, S. Bernuzzi, W. Del Pozzo, V. Nedora, **D. Radice**, and D. Vescovi. *AT2017gfo: Bayesian Inference and Model Selection of Multi-Component Kilonovae and Constraints on the Neutron Star Equation of State*, Monthly Notices of the Royal Astronomical Society **505**, 1661 (2021), arXiv:2101.01201

[37] D. Godzieba, R. Gamba, **D. Radice**, and S. Bernuzzi. *Updated Universal Relations for Tidal Deformabilities of Neutron Stars From Phenomenological Equations of State*, Physical Review D **103**, 063036 (2021), arXiv:2012.12151

[38] V. Nedora, F. Schianchi, S. Bernuzzi, **D. Radice**, B. Daszuta, A. Endrizzi, A. Perego, A. Prakash, and F. Zappa. *Mapping Dynamical Ejecta and Disk masses from Numerical Relativity Simulations of Neutron Star Mergers*, Classical and Quantum Gravity **39**, 015008 (2022) arXiv:2011.11110

[39] E. Abdikamalov, G. Pagliaroli, and **D. Radice**. *Gravitational Waves from Core-Collapse Supernovae*, Handbook of Gravitational Wave Astronomy, arXiv:2010.04356

[40] A. Perego, D. Vescovi, A. Fiore, S. Benetti, S. Bernuzzi, M. Branchesi, S. Cristallo, E. Cappellaro, and **D. Radice**. *Production of Very Light Elements in Kilonovae*, The Astrophysical Journal **925**, 22 (2022), arXiv: 2009.08988

[41] V. Nedora, S. Bernuzzi, **D. Radice**, B. Daszuta, A. Endrizzi, A. Perego, A. Prakash, M. Safarzadeh, F. Schianchi, and D. Logoteta. *Numerical Relativity Simulations of the Neutron Star Merger GW170817: Long-Term Remnant Evolutions, Winds, Remnant Disks, and Nucleosynthesis*, The Astrophysical Journal **906**, 98 (2021), arXiv:2008.04333

[42] D. Godzieba, **D. Radice**, and S. Bernuzzi. *On the Maximum Mass of Neutron Stars and GW190814*, The Astrophysical Journal **908**, 122 (2021), arXiv:2007.10999

[43] H. Nagakura, A. Burrows, D. Vartanyan, and **D. Radice**. *Core-Collapse Supernova Neutrino Emission and Detection Informed by State-of-the-Art Three-Dimensional Numerical Models*, Monthly Notices of the Royal Astronomical Society **500**, 696 (2020), arXiv:2007.05000

[44] **D. Radice**. *Binary Neutron Star Merger Simulations with a Calibrated Turbulence Model*, Symmetry **12**, 1249 (2020), arXiv:2005.09002

[45] P. Mösta, **D. Radice**, R. Hass, E. Schnetter, and S. Bernuzzi. *A Magnetar Engine for Short GRBs and Kilonovae*, The Astrophysical Journal Letters **901**, L37 (2020), arXiv:2003.06043

[46] S. Bernuzzi, M. Breschi, B. Daszuta, A. Endrizzi, D. Logoteta, V. Nedora, A. Perego, F. Schianchi, **D. Radice**, F. Zappa, I. Bombaci, N. Ortiz. *Accretion-Induced Prompt Black Hole Formation in Asymmetric Neutron Star Mergers, Dynamical Ejecta and Kilonova Signals*, Monthly Notices of the Royal Astronomical Society **497**, 1488 (2020), arXiv:2003.06015

[47] **D. Radice**, S. Bernuzzi, and A. Perego. *The Dynamics of Binary Neutron Star Mergers and of GW170817*, Annual Reviews in Nuclear and Particle Science **70** (2020), arXiv:2002.03863

[48] H. Nagakura, A. Burrows, **D. Radice**, and D. Vartanyan. *A Systematic Study of Proto-Neutron Star Convection in Three-Dimensional Core-Collapse Supernova Simulations*, Monthly Notices of the Royal Astronomical Society **492**, 5764 (2020), arXiv:1912.07615

[49] A. Hajela, R. Margutti, K. D. Alexander, A. Kathirgamaraju, A. Baldeschi, C. Guidorzi, D. Giannios, W. Fong, Y. Wu, A. MacFadyen, A. Paggi, E. Berger, P. K. Blanchard, R. Chornock, D. L. Coppejans, P. S. Cowperthwaite, T. Eftekhari, S. Gomez, G. Hosseinzadeh, T. Laskar, B. D. Metzger, M. Nicholl, K. Paterson, **D. Radice**, L. Sironi, G. Terreran, V. A. Villar, P. K. G. Williams, X. Xie, and J. Zrake. *Two years of non-thermal emission from the binary neutron star merger GW170817: rapid fading of the jet afterglow and first constraints on the kilonova fastest ejecta*, The Astrophysical Journal Letters **886**, L17 (2019), arXiv:1909.06393

[50] A. Burrows, **D. Radice**, D. Vartanyan, H. Nagakura, M. A. Skinner, and J. Dolence. *The Overarching Framework of Core-Collapse Supernova Explosions as Revealed by 3D Fornax Simulations* Monthly Notices of the Royal Astronomical Society **491**, 2715 (2020), arXiv:1909.04152

[51] M. Breschi, S. Bernuzzi, F. Zappa, M. Agathos, A. Perego, **D. Radice**, and A. Nagar. *kiloHertz Gravitational Waves from Binary Neutron Star Remnants: Time-Domain Model and Constraints on Extreme Matter*, Physical Review D **100**, 104029 (2019), arXiv:1908.11418

[52] M. Agathos, F. Zappa, S. Bernuzzi, A. Perego, M. Breschi, and **D. Radice**. *Inferring Prompt Black-Hole Formation in Neutron Star Mergers from Gravitational-Wave Data*, Physical Review D **101**, 044006 (2020), arXiv:1908.05442

[53] A. Endrizzi, A. Perego, F. M. Fabbri, L. Branca, **D. Radice**, S. Bernuzzi, B. Giacomazzo, F. Pederiva, and A. Lovato. *Thermodynamics Conditions of Matter in the Neutrino Decoupling Region During Neutron Star Mergers*, European Physics Journal A **56**, 15 (2020), arXiv:1908.04952

[54] V. Nedora, S. Bernuzzi, **D. Radice**, A. Perego, A. Endrizzi, and N. Ortiz. *Spiral-wave Wind for the Blue Kilonova*, The Astrophysical Journal Letters **886**, L30 (2019), arXiv:1907.04872

[55] D. Vartanyan, A. Burrows, and **D. Radice**. *Temporal and Angular Variations of 3D Core-Collapse Supernova Emissions and their Physical Correlations*, Monthly Notices of the Royal Astronomical Society **489**, 2227 (2019), arXiv:1906.08787

[56] V. Srivastava, S. Ballmer, D. A. Brown, C. Afle, A. Burrows, **D. Radice**, and D. Vartanyan. *Detection Prospects of Core-Collapse Supernovae with Supernova-Optimized Third-Generation Gravitational-wave Detectors*, Physical Review D **100**, 043026 (2019), arXiv:1906.00084

[57] H. Nagakura, A. Burrows, **D. Radice**, and D. Vartanyan. *Towards an Understanding of the Resolution Dependence of Core-Collapse Supernova Simulations*, Monthly Notices of the Royal Astronomical Society **490**, 4622 (2019), arXiv:1905.03786

[58] A. Perego, S. Bernuzzi, and **D. Radice**. *Thermodynamics Conditions of Matter in Neutron Star Mergers*, European Physics Journal A **55**, 124 (2019), arXiv:1903.07898

[59] A. Burrows, **D. Radice**, and D. Vartanyan. *Three-Dimensional Supernova Explosion Simulations of 9-, 10-, 11-, 12-, and 13-$M_\odot$ Stars*, Monthly Notices of the Royal Astronomical Society **485**, 3153 (2019), arXiv:1902.00547

[60] **D. Radice**, V. Morozova, A. Burrows, D. Vartanyan, and H. Nagakura. *Characterizing the Gravitational Wave Signal from Core-Collapse Supernovae*, The Astrophysical Journal Letters **876**, L9 (2019), arXiv:1812.07703

[61] G. M. Fuller, A. Kusenko, **D. Radice**, and V. Takhistov. *Positrons and 511 keV Radiation as Tracers of Recent Binary Neutron Star Mergers*, Physical Review Letters **122**, 121101 (2019), arXiv:1811.00133

[62] **D. Radice** and L. Dai. *Multimessenger Parameter Estimation of GW170817*, European Physics Journal A **55**, 50 (2019), arXiv:1810.12917.

[63] **D. Radice**, A. Perego, K. Hotokezaka, S. Bernuzzi, S. A. Fromm, and L. F. Roberts. *Viscous-Dynamical Ejecta from Binary Neutron Star Merger*, The Astrophysical Journal Letters **869**, L35 (2018), arXiv:1809.11163

[64] D. Vartanyan, A. Burrows, **D. Radice**, A. Skinner, J. Dolence. *A Successful 3D Core-Collapse Supernova Explosion Model*, Monthly Notices of the Royal Astronomical Society **482**, 351 (2019), arXiv:1809.05106.

[65] M. A. Skinner, J. C. Dolence, A. Burrows, **D. Radice**, D. Vartanyan. *Fornax: a Flexible Code for Multiphysics Astrophysical Simulations*, The Astrophysical Journal Supplement Series **241**, 7 (2019), arXiv:1806.07390

[66] A. Nagar, S. Bernuzzi, W. Del Pozzo, G. Riemenschneider, S. Akcay, G. Carullo, P. Fleig, S. Babak, K. W. Tsang, M. Colleoni, F. Messina, G. Pratten, **D. Radice**, P. Rettegno, M. Agathos, E. Fauchon-Jones, M. Hannam, S. Husa, T. Dietrich, P. Cerda-Duran, J. A. Font, F. Pannarale, P. Schmidt, and T. Damour. *Time-domain Effective-one-body Gravitational Waveforms for Coalescing Compact Binaries with Nonprecessing Spins, Tides and Self-spin Effects*, Physical Review D **98**, 104052 (2018), arXiv:1806.01772.

[67] T. Dietrich, **D. Radice**, S. Bernuzzi, F. Zappa, A. Perego, B. Brügmann, S. Vivekanandji, R. Dudi, W. Tichy, and M. Ujevic. *CoRe Database of Binary Neutron Star Merger Waveforms and its Application in Waveform Development*, Classical and Quantum Gravity **35**, 24LT01 (2018), arXiv:1806.01625

[68] R. Alfieri, S. Bernuzzi, A. Perego, and **D. Radice**. *Optimization of Finite-Differencing Kernels for Numerical Relativity Applications*, Journal of Low Power Electronics and Applications **8**, 15 (2018) http://www.mdpi.com/2079-9268/8/2/15

[69] S. Seadrow, A. Burrows, D. Vartanyan, **D. Radice**, and M. A. Skinner. *Neutrino Signals of Core-Collapse Supernovae in Underground Detectors*, Monthly Notices of the Royal Astronomical Society **480**, 4710 (2018), arXiv:1804.00689

[70] **D. Radice**, A. Perego, S. Bernuzzi, and B. Zhang. *Long-lived Remnants from Binary Neutron Star Mergers*, Monthly Notices of the Royal Astronomical Society **481**, 3670 (2018), arXiv:1803.10865.

[71] D. Vartanyan, A. Burrows, **D. Radice**, M. A. Skinner, and J Dolence. *Revival of the Fittest: Exploding Core-Collapse Supernovae from 12 to 25 $M_\odot$*, Monthly Notices of the Royal Astronomical Society **477**, 3091 (2018), arXiv:1801.08148.

[72] V. Morozova, **D. Radice**, A. Burrows, and D. Vartanyan. *The Gravitational Wave Signal from Core-Collapse Supernovae*, The Astrophysical Journal **861**, 10 (2018), arXiv:1801.01914.

[73] F. Zappa, S. Bernuzzi, **D. Radice**, A. Perego, and T. Dietrich. *Gravitational-Wave Luminosity of Binary Neutron Stars Mergers*, Physical Review Letters **120**, 111101 (2018), arXiv:1712.04267.

[74] **D. Radice**, E. Abdikamalov, C. D. Ott, P. Mösta, S. M. Couch, and L. F. Roberts. *Turbulence in Core-Collapse Supernovae*, Journal of Physics G **45**, 053003 (2018), arXiv:1710.01282

[75] C. Huete, E. Abdikamalov, and **D. Radice**. *The Impact of Vorticity Waves on the Shock Dynamics in Core-Collapse Supernovae*, Monthly Notices of the Royal Astronomical Society **475**, 3305 (2018), arXiv:1709.07363

[76] **D. Radice**. *General-Relativistic Large-Eddy Simulations of Binary Neutron Star Mergers*, The Astrophysical Journal Letters **838**, L2 (2017), arXiv:1703.02046.

[77] **D. Radice**, A. Burrows, D. Vartanyan, M. A. Skinner, and J. C. Dolence. *Electron-Capture and Low-Mass Iron-Core-Collapse Supernovae: New Neutrino-Radiation-Hydrodynamics Simulations*, The Astrophysical Journal **850**, 43 (2017), arXiv:1702.03927.

[78] **D. Radice**, S. Bernuzzi, W. Del Pozzo, L. F. Roberts, and C. D. Ott. *Probing Extreme-Density Matter with Gravitational Wave Observations of Binary Neutron Star Merger Remnants*, The Astrophysical Journal Letters **842**, L10 (2017), arXiv:1612.06429.

[79] F. Guercilena, **D. Radice**, and L. Rezzolla. *Entropy-Limited Hydrodynamics: a Novel Approach to Relativistic Hydrodynamics*, Computational Astrophysics and Cosmology **4**, 3 (2017), arXiv:1612.06251

[80] A. Burrows, D. Vartanyan, J. C. Dolence, M. A. Skinner, and **D. Radice**. *Crucial Physical Dependencies of the Core-Collapse Supernova Mechanism*, Space Science Reviews **214**, 33 (2018), arXiv:1611.05859.

[81] E. Abdikamalov, A. Zhaksylykov, **D. Radice**, and S. Berdibek. *Shock-Turbulence Interaction in Core-Collapse Supernovae*, Monthly Notices of the Royal Astronomical Society **461**, 3864 (2016), arXiv:1605.09015

[82] **D. Radice**, S. Bernuzzi, and C. D. Ott. *The One-Armed Spiral Instability in Neutron Star Mergers and its Detectability in Gravitational Waves*, Physical Review D **94**, 064011 (2016), arXiv:1603.05726.

[83] S. Bernuzzi, **D. Radice**, C. D. Ott, L. F. Roberts, P. Mösta, and F. Galeazzi. *How Loud Are Neutron Star Mergers?*, Physical Review D **94**, 024023 (2016), arXiv:1512.06397.

[84] **D. Radice**, C. D. Ott, E. Abdikamalov, S. M. Couch, R. Haas, and E. Schnetter. *Neutrino-Driven Convection in Core-Collapse Supernovae: High-Resolution Simulations*, The Astrophysical Journal **820**, 76 (2016), arXiv:1510.05022.

[85] **D. Radice**, L. Rezzolla, and F. Galeazzi. *High-Order Numerical-Relativity Simulations of Binary Neutron Stars*, In proceedings of the 9th International Conference of Numerical Modeling of Space Plasma Flows (ASTRONUM 2014), ASP Conference Series **498**, 121 (2015), arXiv:1502.00551

[86] **D. Radice**, S. M. Couch, and C. D. Ott. *Implicit Large Eddy Simulations of Anisotropic Weakly Compressible Turbulence with Application to Core-Collapse Supernovae*, Computational Astrophysics and Cosmology **2**, 7 (2015), arXiv:1501.03169.

[87] E. Abdikamalov, C. D. Ott, **D. Radice**, L.F Roberts, R Haas, C. Reisswig, P. Mösta, H. Klion, and E. Schnetter. *Neutrino-Driven Turbulent Convection and Standing Accretion Shock Instability in Three-Dimensional Core-Collapse Supernovae*, The Astrophysical Journal **808**, 70 (2015), arXiv:1409.7078.

[88] **D. Radice**, L. Rezzolla, and F. Galeazzi. *High-Order Fully General-Relativistic Hydrodynamics: new Approaches and Tests*, Classical and Quantum Gravity **31**, 075012 (2014), `arXiv:1312.5004`.

[89] **D. Radice**, L. Rezzolla, and F. Galeazzi. *Beyond Second-Order Convergence in Simulations of Binary Neutron Stars in Full General-Relativity*, Monthly Notices of the Royal Astronomical Society: Letters **437**, L46 (2014), `arXiv:1306.6052`.

[90] **D. Radice**, E. Abdikamalov, L. Rezzolla, and C. D. Ott. *A New Spherical-Harmonics Scheme for Multi-Dimensional Radiation Transport I: Static Matter Configurations*, Journal of Computational Physics **242**, 648 (2013), `arXiv:1209.1634`

[91] **D. Radice** and L. Rezzolla. *Universality and Intermittency in Relativistic Turbulent Flows of Hot Plasma*, The Astrophysical Journal Letters **766**, L10 (2013), `arXiv:1209.2936`.

[92] **D. Radice** and L. Rezzolla. *THC: a New High-Order Finite-Difference High-Resolution Shock-Capturing Code for Special-Relativistic Hydrodynamics*, Astronomy & Astrophysics **547**, A26 (2012), `arXiv:1206.6502`.

[93] **D. Radice** and L. Rezzolla. *Discontinuous Galerkin Methods for General-Relativistic Hydrodynamics: Formulation and Application to Spherical Symmetric Spacetimes*, Physical Review D **84**, 024010 (2011), `arXiv:1103.2426`.

[94] T. Kellerman, L. Rezzolla, and **D. Radice**. *Critical Phenomena in Neutron Stars II: Head-on Collisions*, Classical and Quantum Gravity **27**, 235016 (2010), `arXiv:1007.2797`

[95] **D. Radice**, L. Rezzolla, and T. Kellerman. *Critical Phenomena in Neutron Stars I: Linearly Unstable Nonrotating Models*, Classical and Quantum Gravity **27**, 235015 (2010), `arXiv:1007.2809`

Seminars and Invited Talks

1. *Multimessenger Astronomy with Numerical Relativity*
   Physics Colloquium at The Pennsylvania State University, University Park (PA), Sept. 21, 2023

2. *Nuclear Astrophysics with Numerical Relativity*
   Physics Colloquium at Kent State University, Kent (OH), Aug. 31, 2023

3. *Neutrinos and Nucleosynthesis in Neutron Star Mergers*
   Invited Talk at the Annual International Conference on Numerical Modeling of Space Plasma Flows 2023, Pasadena (CA), June 28, 2023

4. *Neutrinos and Nucleosynthesis in Neutron Star Mergers*
   Invited Talk at the Mathematical and Computational Challenges in the Era of Gravitational Wave Astronomy Reunion Conference, Lake Arrowhead (CA), June 12, 2023

5. *Neutrino Effects in Neutron Star Mergers*
   Invited Talk at the PCTS/GI workshop Multi-messenger Modeling of Neutron Star Mergers, Princeton (NJ), May 9, 2023

6. *Neutron Star Merger Simulations: Recent Progress and Open Challenges*
   Invited Talk at the PCTS/GI workshop New Perspectives In Numerical Methods For High-Energy Multiscale Astrophysics, Princeton (NJ), Apr. 26, 2023

7. *Multimessenger Astrophysics with Numerical Relativity*
   Colloquium at the University of Tennessee, Knoxville (TN), Mar. 6, 2023

8. *Nuclear Astrophysics with Numerical Relativity*
   Colloquium at the University of Washington, Seattle (WA), Mar. 2, 2023

9. *Multimessenger Astrophysics with Numerical Relativity*
   Seminar at Johns Hopkins, Baltimore (MD), Feb. 20, 2023

10. *Turbulence in Neutron Star Mergers*
    Invited Talk at the American Physical Society, Division of Fluid Dynamics Meeting, Indianapolis (IN), November 21, 2022

11. *Multimessenger Astrophysics with Numerical Relativity*
Seminar at the Max Planck Institute for Gravitational Physics (Online), November 8, 2022

12. *Binary Neutron Star Mergers: Dynamics and Multimessenger Aspects*
Invited Talk at the workshop The Future of Neutron Rich Matter: From Neutron Skins to Neutron Stars, Amherst (MA), October 13, 2022

13. *Neutron Star Mergers and the Equation of State of Dense Matter*
Invited Talk at the GW-EM Workshop 2022, Weizmann Institute of Science, Israel, June 30, 2022

14. *Numerical Relativity Simulations of Binary Neutron Star Mergers*
Invited Talk at the TCAN Meeting 2022 (Online), June 22, 2022

15. *Nuclear Physics Effects in Neutron Star Mergers*
Plenary Talk at the 7th Symposium on Neutrinos and Dark Matter in Nuclear Physics (NDM22) at Asheville (NC), May 16, 2022

16. *Multimessenger Astrophysics with Neutron Star Mergers*
Space Science Seminar at ZARM, University of Bremen (Online), May 2, 2022

17. *Multimessenger Astrophysics with Neutron Star Mergers*
Strong Gravity Seminar at Perimeter Institute (Online), Apr. 21, 2022

18. *GRMHD Effects in Neutron Star Mergers*
Invited talk at the APS April Meeting in New York City (NY), Apr. 12, 2022

19. *Multimessenger Astrophysics with Neutron Star Mergers*
Cosmology Seminar at the University of Minnesota (Online), Feb. 21, 2022

20. *Multimessenger Astrophysics with Neutron Star Mergers*
Colloquium Johns Hopkins and Space Telescope Science Institute (Online), Feb. 8, 2022

21. *Multimessenger Astrophysics with Neutron Star Mergers*
Physics colloquium at the University of Houston (Online), Oct. 26, 2021

22. *Binary Neutron Star Mergers*
Invited talk at the Workshop on Computational Challenges in Multi-Messenger Astrophysics at UCLA/IPAM in Los Angeles (CA), Oct. 4, 2021

23. *Neutron Star Merger Dynamics*
Theory seminar at the Washington University in St. Luis, Sept. 16, 2021

24. *Neutron Star Mergers*
N3AS seminar at the University of Washington (Online), Sept. 2, 2021

25. *The Merger Phase of Binary Neutron Star Mergers*
Invited talk at the TCAN Meeting 2021: BNS/BH-NS Merger Workshop, July 16, 2021

26. *NR Simulations of BNS Mergers: Recent Results and Open Problems*
Lecture at the XIV SIGRAV School "De Multis Sidereis Nunciis, Multi-messenger Astrophysics", Online, July 2, 2021

27. *Binary Neutron Star Mergers*
Plenary talk at the Gravitational Wave Advanced Detector Workshop 2021, May 12, 2021

28. *Binary Neutron Star Merger Dynamics and Electromagnetic Counterparts*
Astrophysics Seminar at the Texas Technical University, May 24, 2021

29. *Neutron Star Merger Dynamics*
CCGR at the Rochester Institute of Technology, Apr. 2, 2021

30. *Neutron Star Merger Simulations*
Multiphysics Seminar Los Alamos National Laboratory, Mar. 17, 2021

31. *Neutron Star Merger Dynamics*
Colloquium at the Albert Einstein Institute, Jan. 28, 2021

32. *The Strong Field Dynamics of Neutron Star Mergers*
Invited talk at the APS Mid-Atlantic meeting, Dec. 6, 2020

33. *Neutron Star Merger Dynamics*
Invited talk at ICERM program on Advances in Computational Relativity, Oct. 27, 2020

34. *Neutron Star Merger Dynamics*
Nuclear Theory Seminar at the University of Maryland, Sept. 4, 2020

35. *Status and Future of Numerical Relativity Simulations of Binary Neutron Star Mergers*
Invited talk at the workshop From Heavy-Ion Collisions to Neutron Stars, Aug. 21, 2020

36. *Neutron Star Merger Dynamics*
N3AS Seminar
Remotely, July 28, 2020

37. *Neutron Star Mergers*
Invited talk at the TCAN on Binary Neutron Stars Workshop 2020,
Remotely, July 6, 2020

38. *Neutron Star Merger Dynamics*
Invited talk at the 2nd Nuclear and Particle Theory Meeting, Remotely, May 12, 2020

39. *Multimessenger Astrophysics with Numerical Relativity*
HET Seminar at John Hopkins University, Baltimore, MD, Feb. 18, 2020

40. *The Fluid Dynamics of Core-Collapse Supernovae*
FDRC Seminar at The Pennsylvania State University, State College PA, Jan. 30, 2020

41. *Neutron Star Mergers: Simulations and Nuclear Astrophysics*
Invited talk at the JINA-INT Workshop on Dense Matter & Neutron Star Mergers, Seattle WA, USA, Dec. 17, 2019

42. *Gravitational Waves from Core-Collapse Supernovae*
LIGO Seminar in remote, Oct. 3, 2019

43. *Numerical Relativity Simulations of Neutron Star Mergers*
IGC Seminar at IGC, The Pennsylvania State University, State College PA, Sept. 6, 2019

44. *Neutron Star Merger Simulations with WhiskyTHC*
Invited talk at the North American Einstein Toolkit Workshop 2019, Rochester NY, USA, June 19, 2019

45. *Thermodynamical Properties of Matter in Neutron Star Mergers*
Invited talk at the JINA-INT Workshop on Weak Interactions for Astrophysics, Seattle WA, USA, June 3, 2019

46. *Numerical Relativity Simulations of Neutron Star Mergers*
Invited talk at the Explosive Nucleosynthesis in the Supernova and Merging-Neutron-Star Contexts Workshop, Princeton NJ, USA, May 22, 2019

47. *Numerical Relativity Simulations of Neutron Star Mergers*
Invited talk at the APS April Meeting, Denver CO, USA, Apr. 14, 2019

48. *Numerical Relativity Simulations of Neutron Star Mergers*
Invited talk at the Gravity Initiative Inaugural Meeting, Princeton NJ, USA, Mar 6, 2019

49. *Modeling Neutron Star Mergers*
Public lecture at the Princeton ACM chapter, Princeton NJ, USA, Jan. 18, 2019

50. *Neutron Star Merger Simulations*
Invited talk at the Gravitational Wave Physics and Astronomy Workshop (GWPAW) 2018, College Park MD, USA, Dec. 3, 2018

51. *Multimessenger Astrophysics with Numerical Relativity*
Seminar at the University of Milano Bicocca, Milan, Italy, Oct. 19, 2018

52. *Gravitational Waves and Neutrinos from Core-Collapse Supernovae*
Invited talk at the Deciphering the multi-Dimensional nature of core-collapse SuperNovae via Gravitational-Wave and neutrino signatures (SNeGWv2018), Toyama, Japan, Oct. 10, 2018

53. *Multimessenger Astrophysics with Numerical Relativity*
Astrophysics seminar at the Los Alamos National Laboratory, Los Alamos NM, Sept. 20, 2018

54. *Neutron Star Merger Simulations*
Invited talk at the FRIB and the GW170817 kilonova topical program, Michigan State University, East Lansing MI, USA, Jul. 16, 2018

55. *Neutron Star Merger Simulations*
Invited talk at the Compact Stars in the QCD Phase Diagram VII workshop, New York City, USA, June 12, 2018

56. *Discovery of Gravitational Waves and Light from Merging Neutron Stars: Implications and Open Questions*
Invited talk at the 3rd Workshop on Relativistic Plasma Astrophysics, Purdue IN, USA, May 7, 2018

57. *Nuclear Astrophysics in the Next LIGO Observing Run*
Invited talk at the Gravitational Wave Astrophysics in the Next LIGO Observing Run Workshop, Princeton Center for Theoretical Sciences, Princeton NJ, Apr. 28, 2018

58. *Turbulent Angular Momentum Transport in Neutron Star Mergers*
Invited talk at the Max Planck Princeton Center (MPPC) for Plasma Physics Annual Workshop, Princeton NJ, Apr. 25, 2018

59. *Simulations of Neutron Star Mergers and Core-Collapse Supernovae*
Seminar at the Pennsylvania State University, State College PA, Mar. 27, 2018

60. *Microphysics Effects in Core-Collapse Supernovae and Neutron Star Mergers*
Invited talk at the Physics of Core-Collapse Supernovae and Compact Star Formations Workshop, Waseda University, Tokyo, Japan, Mar. 21, 2018

61. *Simulations of Neutron Star Mergers: Status and Prospects*
Invited talk at the INT Program INT-18-72R, First Multi-Messenger Observation of a Neutron Star Merger and its Implications for Nuclear Physics INT workshop, Seattle WA, Mar. 13, 2018

62. *Multimessenger Astrophysics with Numerical Relativity*
Colloquium at the Syracuse University, Syracuse NY, Feb. 26, 2018

63. *Multimessenger Astrophysics with Numerical Relativity*
Colloquium at the Pennsylvania State University, State College PA, Feb. 21, 2018

64. *Multimessenger Astrophysics with Numerical Relativity*
Nuclear theory special seminar at the University of Minnesota, Minneapolis MN, Feb. 6, 2018

65. *Multimessenger Astrophysics with Numerical Relativity*
Colloquium at the North Carolina State University, Raleigh NC, Jan. 28, 2018

66. *Multimessenger Astrophysics with Numerical Relativity*
CITA seminar at the Canadian Institute for Theoretical Astrophysics, Toronto, Canada, Jan. 18, 2018

67. *NS Merger Simulations: Lessons Learned*
Invited talk at the GW170817: The First Double Neutron Star Merger workshop, Santa Barbara CA, USA, Dec. 6, 2017

68. *Neutron Star Mergers*
Seminar at the Black Hole Initiative, Harvard University, Cambridge MA, USA, Dec. 4, 2017

69. *The Role of NS Merger Simulations in the Post-Detection Era*
Invited talk at The Astrophysics of NS Mergers workshop, New York City, USA, Nov. 21, 2017

70. *Towards the Modeling of PBH-NS Interactions with Numerical Relativity*
Invited talk at Focus Week on Primordial Black Holes, Tokyo, Japan, Nov. 17, 2017

71. *NS Merger Simulations: Lessons Learned*
Invited talk at Rapid Response Workshop: Binary NS Merger, New York, USA, Oct. 20, 2017

72. *Neutrino Signature from Multi-D Supernova Models*
Invited talk at νEclipse: New Extensions of Coherent scattering and other Lepton Interactions for new Physics SEarches, Knoxville TN, USA, Aug. 20, 2017

73. *Numerical Simulations of Binary Neutron Star Mergers*
Invited talk at the Microphysics for Relativistic Astrophysics workshop in East Lansing MI, USA, Jul. 17, 2017

74. *Dynamical Mass Ejection from Compact Binary Mergers*
Invited talk at the Nuclear Astrophysics in the Gravitational Wave Astronomy Era workshop at ECT*, Trento, Italy, June 15, 2017

75. *Nature's Ultimate Hadron Collider: Neutron Star Mergers*
Seminar at University of Pavia, Pavia, Italy, May. 31, 2017

76. *Simulations of Binary Neutron Star Mergers*
Invited talk at the LSST-LIGO workshop, New York City, USA, May 12, 2017

77. *Nature's Ultimate Hadron Collider: Neutron Star Mergers*
Seminar at Oak Ridge National Laboratory, Oak Ridge TN, USA, Apr. 27, 2017

78. *Numerical Simulations of Neutron Star Mergers*
Seminar at the University of Massachusetts, Dartmouth MA, USA, Apr. 19, 2017

79. *Neutron Star Mergers*
Colloquium at the University of Arizona, Tucson AZ, USA, Mar. 21, 2017

80. *Neutrino-Radiation-Hydrodynamics Simulations of Neutron Star Mergers*
Invited talk at the SIAM Computational Science and Engineering Conference, Atlanta GA, USA, Feb. 27, 2017

81. *Nature's Ultimate Hadron Collider: Neutron Star Mergers*
JINA Seminar at the Michigan State University, East Lansing MI, USA, Jan. 9, 2017

82. *Core-Collapse Supernovae: from the* Micro *to the* Macro
LIGO Seminar in remote, Dec. 16, 2016

83. *Simulations of Binary Neutron Star Mergers: the State of the Art*
Invited talk at the 2016 JSI Workshop, on Astrophysics in the Era of Gravitational Wave and Multimessenger Observations Annapolis MD, USA, Nov. 10, 2016

84. *Multimessenger Observations of Neutron Star Mergers: Probing the Physics of High-Density Matter*
Invited talk at the APS Division of Nuclear Physics Meeting, Vancouver, Canada, Oct. 14, 2016

85. *Turbulent Lives: Tales of Neutron Stars*
IAS Informal Seminar at the Institute for Advanced Study, Princeton NJ, USA, Oct. 6, 2016

86. *Turbulent Lives: Tales of Neutron Stars*
LIGO Seminar at the California Institute of Technology, Pasadena CA, USA, Aug. 2, 2016

87. *The Role of Turbulence in Core-Collapse Supernova Explosions*
Invited talk at the Annual International Conference on Numerical Modeling of Space Plasma Flows 2016, Monterey CA, USA, June 7, 2016

88. *Simulations of Double Neutron Star Mergers*
Invited talk at the JINA-CEE International Symposium on Neutron Stars in the Multi-Messenger Era: Prospects and Challenges, Athens OH, USA, May 26, 2016

89. *The Role of Turbulence in Core-Collapse Supernova Explosions*
Invited talk at the 2nd Workshop on Relativistic Plasma Astrophysics, Purdue IN, USA, May 11, 2016

90. *Double Neutron Star Mergers*
Seminar at the JINA-MA2 Biweekly Online Seminar Series, Pasadena CA, USA, Apr. 22, 2016

91. *Neutron Star Merger Simulations with the WhiskyTHC Code*
Seminar at the Yukawa Institute for Theoretical Physics, Kyoto, Japan, Mar. 17, 2016

92. *Turbulent Lives: Tales of Neutron Stars*
Seminar at Florida State University, Tallahassee FL, USA, Feb. 3, 2016

93. *Turbulent Lives: Tales of Neutron Stars*
Seminar at the University of Nevada Las Vegas, Las Vegas NV, USA, Jan. 22, 2016

94. *Turbulent Lives: Tales of Neutron Stars*
Seminar at Nazarbayev University, Astana, Kazakhstan, Jan. 13, 2016

95. *Turbulent Lives: Tales of Neutron Stars*
Seminar at the Astronomical Institute, Tashkent, Uzbekistan, Jan. 8, 2016

96. *Turbulent Lives: Tales of Neutron Stars*
Seminar at the Institute of Nuclear Physics, Tashkent, Uzbekistan, Jan. 7, 2016

97. *The WhiskyTHC Code*
Invited talk at the Einstein Toolkit workshop 2015, Stockholm, Sweden, Aug. 12, 2015

98. *Introduction to Core-Collapse Supernova Theory*
Seminar California Institute of Technology and University of California, Los Angeles Shared Analysis Seminar, Pasadena CA, USA, May 1, 2015

99. *Neutrino-Driven Turbulent Convection in Stalled Supernova Cores*
Seminar at the Physics Department of Frankfurt University, Frankfurt, Germany, Dec. 9, 2014

100. *Beyond Second Order Accuracy in Numerical Relativity Simulation of Binary Neutron Stars*
Invited talk at the Annual International Conference on Numerical Modeling of Space Plasma Flows 2014, Long Beach CA, USA, June 6, 2014

101. *Numerical Simulations of Relativistic Turbulence*
Invited talk at the Workshop on Relativistic Plasma Astrophysics, Purdue IN, USA, May 14, 2014

102. *Numerical Simulation of Binary Neutron Stars Merger*
Seminar at the Astronomical Institute, Tashkent, Uzbekistan, Jul. 19, 2013

103. *Numerical Simulation of Binary Neutron Stars Merger*
Seminar at the Institute of Nuclear Physics, Tashkent, Uzbekistan, Jul. 17, 2013

104. *Filtered Spherical Harmonics Scheme and General Relativistic Radiation Transport*
Seminar at CCES at RWTH Aachen University, Aachen, Germany, Apr. 25, 2013

105. *Turbulence and Relativity*
Seminar at the Albert Einstein Institute, Potsdam, Germany, Apr. 10, 2013

106. *A New Spherical-Harmonics Scheme for Multidimensional Radiation Transport*
Invited talk at the SIAM Conference on Computational Science and Engineering, Boston MA, USA, Feb. 27, 2013

107. *Turbulence and Relativity*
TAPIR Seminar at the California Institute of Technology, Pasadena CA, USA, June 22, 2012

108. *Discontinuous Galerkin Methods for General Relativistic Hydrodynamics*
Seminar: Albert Einstein Institute and Louisiana State University shared video-seminar, Potsdam, Germany, Jan. 13, 2011

Contributed Talks

1. *Numerical Relativity with Athena*
Contributed Talk at the Athena User Meeting, New York City (NY), May 12, 2023

2. *The Merger Phase of Binary Neutron Star Mergers*
Penel Contribution at the VII Physics and Astrophysics at the Extreme (PAX) workshop, online, Aug. 26, 2021

3. *Discussion on Gravitational Wave and Simulations from Binary Neutron Star Mergers*
Panel Contribution at the Neutron Stars as Multimessenger Laboratories for Dense Matter workshop, ECT*, online, June 17, 2021

4. *Modeling the Complete Gravitational Wave Signal from Binary Neutron Star Mergers*
Panel Contribution at the IGC@25: Multimessenger Universe Conference, State College PA, June 24, 2019

5. *GW170817: Joint Constraint on the Neutron Star Equation of State from Gravitational Waves and Electromagnetic Observations*
Talk at the APS April Meeting, Columbus USA, Apr. 16, 2018

6. *Numerical Simulations of Binary Neutron Star Mergers*
Talk at the INT Program INT-17-2b, Electromagnetic Signatures of r-process Nucleosynthesis in Neutron Star Binary Mergers, Seattle USA, Aug. 18, 2017

7. *Probing Extreme-Density Matter with Gravitational-Wave Observations of Binary Neutron Star Mergers*
Talk at Bridging Nuclear and Gravitational Physics: the Dense Matter Equation of State, ECT*, Trento, Italy, Jun. 6, 2017

8. *Dynamical Ejecta from Binary Neutron Star Mergers*
Talk at 21th International Conference on General Relativity and Gravitation, New York City USA, Jul. 13, 2016

9. *A Turbulent Dynamo in Rotating Core-Collapse Supernovae*
Talk at Blue Water Symposium, Sunriver USA, Jun. 13, 2016

10. *Dynamical Ejecta from Binary Neutron Star Mergers*
Talk at the APS April Meeting 2016, Salt Lake City USA, Apr. 16, 2016

11. *Neutrino-Driven Convection in Stalled Supernova Cores*
Talk at Microphysics in Computational Relativistic Astrophysics 2015, Stockholm, Sweden, Aug. 21, 2015

12. *Neutrino-Driven Turbulent Convection in Stalled Supernova Cores*
Talk at the APS April Meeting 2015, Baltimore USA, Apr. 11, 2015

13. *High-Order Order Methods for General-Relativistic Hydrodynamics*
Talk at INT Program on Binary Neutron Star Coalescence as a Fundamental Physics Laboratory, Seattle, USA, Jul. 9, 2014

14. *Beyond Second Order Accuracy in Numerical Relativity Simulation of Binary Neutron Stars*
Talk at the APS April Meeting 2014, Savannah USA, Apr. 7, 2014

15. *Beyond Second Order Accuracy in Numerical Relativity Simulation of Binary Neutron Stars*
Talk at 30th Pacific Coast Gravity Meeting, San Diego, USA, Mar. 28, 2014

16. *Charon: a New Code for Multidimensional Radiation Transport*
Talk at Microphysics in Computational Relativistic Astrophysics 2013, ECT*, Trento, Italy, Sept. 27, 2013

17. *Charon: a New Code for Multidimensional Radiation Transport*
Talk at SFB meeting 2012, Munich, Germany, Oct. 17, 2012

18. *Universality and Intermittency in Relativistic Turbulent Flows of Hot Gas*
Talk at Annual International Conference on Numerical Modeling of Space Plasma Flows 2012, Big Island of Hawaii, USA, Jun. 27, 2012

19. *Discontinuous Galerkin Methods for General Relativistic Hydrodynamics*
Talk at Parma Workshop on Numerical Relativity and Gravitational Waves 2011, Parma, Italy, Sept. 9, 2011

20. *Discontinuous Galerkin Methods for General Relativistic Hydrodynamics*
Talk at Microphysics in Computational Relativistic Astrophysics 2011, Perimeter Institute, Waterloo, Ontario, Canada, Jun. 23, 2011

21. *Discontinuous Galerkin Methods for General Relativistic Hydrodynamics*
Talk at Multimessenger Emissions from Sources of Gravitational Waves, Sau Sebastiao, Brazil, Dec. 2, 2010

22. *Very High Order Discontinuous Galerkin Methods for General Relativistic Hydrodynamics in Spherical Symmetry*
Talk at Workshop on Unstructured Meshes in Dynamical Spacetimes, Jena, Germany, Aug. 26, 2010

Research Support

Monetary Awards

- PI: R. Hix, Co-PIs: A. Dubey, D. Kasen, G. McLaughlin, O. E. B. Messer, **D. Radice**, R. Surman; DOE DE-SC0024388; $2,200,000; 2023 – 2027; *Exascale Nuclear Astrophysics for FRIB*
- PI: **D. Radice** Sloan Foundation; $75,000; 2022 – 2024; *Multimessenger Astrophysics with Numerical Relativity*
- PI: **D. Radice**; NASA 80NSSC21K1720; $532,727; 2021 – 2024; *Next Generation Numerical Relativity Waveforms for LISA Black Holes*
- PI: **D. Radice** Co-PI: K. Murase; NSF AST-2108467; $478,283 + $66,900 REU supplement; 2021 – 2024; *WoU-MMA: High-Energy Emission from Neutron Star Mergers*
- PI: A. Steiner, Co-PIs: D. Brown, C. Horowitz, C. Ratti, **D. Radice**; NSF PHY-2116686; $3,250,000; 2021 – 2026; *Nuclear Physics from Multi-Messenger Mergers Focus Research Hub*
- PI: W. Haxton, Co-PIs: B. Balentekin, G. Fuller, G. McLaughlin, SIs: A. DeGuevea, F. Foucart, S. Gardner, D. Kasen, J. Lattimer, T. Lin, K. Mack, D. Phillips, M. Prakash, Y.-Z. Qian, E. Quataert, **D. Radice**, S. Reddy, U. Seljak, R. Surman; NSF PHY-2020275; $10,900,000; 2020 – 2025; *Network for Neutrinos, Nuclear Astrophysics, and Symmetries Physics Frontier Center*
- PI: **D. Radice**; DOE DE-SC0021177; $750,000; 2020 – 2025; *Exascale Simulations of Neutron Star Mergers*
- PI: **D. Radice**; NSF PHY-2011725; $210,000; 2020 – 2024; *WoU-MMA: Multimessenger Parameter Estimation for Binary Neutron Star Mergers*
- PI: Hix; Co-PIs: A. Almgren, A. Burrows, A. C.'Calder, S. M. Couch, A. Dubey, C. L. Fryer, G. M. Fuller, D. Kasen, O. E. B. Messer, A. Mezzacappa, S. Reddy, L. F. Roberts, R. Surman, A. W. Steiner, M. Zingale; SIs: J. Bell, S. W.Bruenn, C. Cardall, A. Christlieb, J. C. Dolence, E. Endeve, W. P. Even, W. Haxgon, A. L. Hungerford, J. Lattimer, E. J.Lentz, C. M. Malone, E.Quataert, **D. Radice**, R. T. Wollaeger, S. E. Wooesley; DOE SciDAC; $7,500,000; 2017 – 2022; *Towards Exascale Astrophysics of Mergers and Supernovae*

Compute Time Allocations

- PI: **D. Radice**, Co-PIs: M. Bhattacharya, M. Bhattacharyya, P. Espino, E. Gutiérrez, P. Hammond, K. Murase, A. Rashti; NSF LRAC; 2.3M node hours; 2023 – 2024; *Numerical Simulations of Compact Binary Mergers*
- PI: **D. Radice**, Co-PIs: M. Bhattacharyya, P. Espino, R. Kashyap; NSF XSEDE; 18M CPU hours; 2022 – 2023; *Numerical Simulations of Neutron Star and Black Hole Mergers*

- PI: **D. Radice**; DOE NERSC; 80k node hours; 2023; *Neutron Star Mergers: Nucleosynthesis and Multimessenger Emissions*
- PI: **D. Radice**; DOE NERSC; 180k node hours; 2022; *Neutron Star Mergers: Nucleosynthesis and Multimessenger Emissions*
- PI: **D. Radice**, Co-PI: R. Kashyap; NSF XSEDE; 36M CPU hours; 2020 – 2021; *Numerical Simulations of Neutron Star and White Dwarf Mergers*
- PI: **D. Radice**; DOE NERSC; 17M CPU hours; 2021; *Neutron Star Mergers: Nucleosynthesis and Multimessenger Emissions*
- PI: **D. Radice**; SF XSEDE; 5.1M CPU hours; 2020; *Numerical Simulations of Neutron Star Mergers*
- PI: **D. Radice**; DOE NERSC; 19M CPU hours; 2020; *Neutron Star Mergers: Nucleosynthesis and Multimessenger Emissions*
- PI: **D. Radice**m DOE NERSC; 41M CPU hours; 2019; *Neutron Star Mergers: Nucleosynthesis and Multimessenger Emissions*
- PI: **D. Radice**, Co-PI: S. Bernuzzi; NSF XSEDE; 1.7M CPU hours; 2018 – 2019; *Numerical Simulations of Neutron Star Mergers*
- PI: Mösta, Co-PI: **D. Radice**; NSF PRAC; 5.6M node hours and $15,000; 2018 – 2019; *Petascale Simulations of Neutron Star Mergers*
- PI: **D. Radice**, Co-PI: S. Bernuzzi; NSF XSEDE; 5.5M CPU hours; 2017 – 2018; *Numerical Simulations of Neutron Star Mergers*
- PI: **D. Radice**, Co-PI: S. Bernuzzi; NSF XSEDE; 3.7M CPU hours; 2016 – 2017; *Numerical Simulations of Neutron Star Mergers*
- PI: C. D.Ott, Co-PIs: S. Bernuzzi, R. Haas, C. C. Moran, V. Giryanskaya, **D. Radice**, C. Reisswig, L. Roberts, E. Schnetter; NSF XSEDE; 21M CPU hours; 2015 – 2016; *Simulations of Relativistic Astrophysical Systems*

Mentoring

Postdoctoral Scholars

Current

Maitraya Bhattacharyya • Eduardo Mario Gutiérrez • Pedro Espino • Peter Hammond • Alireza Rashti

Former

Rahul Kashyap (research professor at Penn State)

Graduate Students

Current

Jacob Fields • Aviral Prakash • Estuti Shukla • Yi Qiu

Former

Abhishek Das • Daniel Godzieba • Luis Longo (postdoc at U Jena) • Surendra Padamata

Undergraduate Students

Current

Harsharaj Bandyopadhyay • Louis Buchalter • Andrew Noe • Dante Raso

Former

Vorrapard Kumthongdee • Mathew Leon (graduate student at Ohio State) • Anahi Lopez • Thomas Nguyen (Penn State ARL)

Teaching

Instructor of record

- Astrophysical Fluid Dynamics (Penn State; ASTRO-440): spring 2023
- Special and General Relativity (Penn State; PHYS-479): fall 2022
- Numerical Relativity (Penn State; PHYS-597): spring 2022
- Introduction to Astrophysics (Penn State; ASTRO-440): spring 2021
- Methods of Theoretical Physics (Penn State; PHYS-525): fall 2020, 2021
- Computational Physics (Penn State; PHYS-527): fall 2019

Others

- Lecturer at the N3AS Summer School on Multi-Messenger Astrophysics, UC Santa Cruz, July 15 – 24, 2023
- Co-organizer and teaching assistant for "Entering Research", a workshop for beginning graduate students in physics, Penn State, May 18–19, 2021
- Lecturer at the "Multi-messenger in Astrophysics" school at Como, Italy, June 28 – July 2, 2021
- Lecturer at the "Neutron star mergers for non-experts: GW170817 in the multi-messenger astronomy and FRIB eras" summer school at FRIB, Michigan, May 16–18, 2018

Service

University Service

- Ph.D. dissertation committee
  - A. Prakash (chair; in progress)
  - J. Fields (chair; in progress)
  - M. Ryan (member; thesis defended May 5, 2023)
  - G. Nagaraj (member; thesis defended Apr. 11, 2023)
  - A. Dhani (member; thesis defended Oct. 10, 2022)
  - S. Borhanian (member; thesis defended Mar. 29, 2021)
- Faculty search committee (member; Penn State Department of Astronomy; 2023)
- Graduate admission committee (member; Penn State Department of Physics; 2022 – now)
- Graduate mentoring and advising committee (member; Penn State Department of Physics; 2021 – now)
- APS-Bridge committee (member; Penn State Department of Physics; 2020 – now)
- Gravity, Astoparticle and Particle Physics Seminar (member; Penn State Department of Physics; 2022 – now)
- Fundamental theory seminar committee (**chair**; Penn State Department of Physics; 2019 – 2022)
- IT advisory board (member; Penn State Eberly College of Science; 2020 – now)
- Colloquium committee (member; Penn State Department of Physics; 2019 – 2020)
- Colloquium committee (member; Penn State Department of Astronomy & Astrophysics; 2019 – 2020)
- Colloquium committee (member; Institute for Advanced Study; 2018 – 2019)

Service to the Profession

- Referee for Computer Physics Communications, Computer & Mathematics, European Physical Journal A, Journal of Computational and Applied Mathematics, Nature, Monthly Notices of the Royal Astronomical Society, Physics Letters A, Physica Scripta, Physical Review D, Physical Review Letters, Physical Review X, Physics of Fluids, SIAM Journal on Numerical Analysis, SIAM Journal on Scientific Computing, Symmetry, The Astrophysical Journal, The Astrophysical Journal Letters, and Universe
- Proposal referee or panelist for DiRAC (UK supercomputing), DOE (Department of Energy), FONDECYT (main science founding agency in Chile), ERC (European Research Council), NASA (National Aeronautics and Space Administration), NSERC (National Sciences and Engineering Research Council of Canada), NSF (National Science Foundation), PRACE (Partnership for Advanced Computing in Europe), RGC Hong Kong, and the Swiss National Supercomputing Center
- Program Organizer for the "Astrophysical Neutrinos and the Origin of the Elements", July 17 – Aug. 11, 2023 (INT; University of Washington)
- Program Organizer for the "Plasmas in Strong Gravity" program at the Aspen Center for Physics, July 18 – Aug. 8, 2022.
- Program Organizer for "The r-process and the nuclear EOS after aLIGO's third observing run", May 23-27, 2022 (INT; University of Washington)
- Conference Organizer for the "The first compact star merger event – implications for nuclear and particle physics", held Oct. 14-18, 2019, at European Centre for Theoretical Studies in Nuclear Physics and Related Areas (ECT*; Trento, Italy)
- Guest editor for the topical issue "The first Neutron Star Merger Observation – Implications for Nuclear Physics" on the European Physics Journal A
- Scientific Committee member for the INT-18-72R workshop at the Institute for Nuclear Theory, Mar. 12 - 14, 2018, Institute for Nuclear Theory (INT; University of Washington)

Service to the Society

- Main developer of the open-source general-relativistic hydrodynamics code `WhiskyTHC`.
  `http://personal.psu.edu/dur566/whiskythc.html`
- Main developer of the open-source visualization program `pygraph`.
  `http://bitbucket.org/dradice/pygraph`