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Roland Haas

Curriculum vitae

Professional Experience

04/2025–current **Scientific Software Developer**, *CHIME, University of British Columbia*, Vancouver, BC
Computational Astronomy

07/2016–04/2025 **Senior research programmer**, *National Center for Supercomputing Applications, University of Illinois*, Urbana, IL
Numerical Relativity

09/2014–07/2016 **Junior scientist / Postdoc**, *Albert Einstein Insititute*, Potsdam, Advisor: Alessandra Buonanno
Numerical Relativity

09/2011–08/2014 **Postdoctoral research fellow**, *Caltech*, Pasadena, Advisor: Christian Ott
Numerical Relativity

08/2008–09/2011 **Postdoctoral research fellow**, *Georgia Tech*, Atlanta, Advisor: Pablo Laguna
Numerical astrophysics

Education

12/2005–08/2008 **PhD in physics**, *University of Guelph*, Guelph
Self-force on point particles in orbit around a Schwarzschild black hole
Advisor: Eric Poisson

09/2003–12/2005 **MSc in physics**, *University of Guelph*, Guelph
Mass loss of a scalar charge in cosmological spacetimes
Advisor: Eric Poisson

09/1999-09/2003 **Diplom in physics**, *Universitaet Konstanz*, Konstanz, Germany
unfinished, left for Canada

09/1990–08/1999 **High school**, *Scheffel Gymnasium*, Lahr, Germany

Research Interests and Areas

○ Numerical relativity

○ Relativistic (magneto-)hydrodynamics

- ○ Extreme mass ratio inspirals and self-force problems
- ○ Black hole perturbation theory
- ○ Gravitational and electromagnetic emission from mixed black hole—star systems
- ○ The Einstein Toolkit
- ○ Numerical techniques for mesh refinement, and elliptic problems

Grants and Awards

Research grants

08/2024–current	Principal investigator of NSF OAC grant 2411068 "E=mc2 - Enabling Multimessenger astrophysics through Community-driven Cyberinfrastructure" (USD 3,369,101, 4 yrs)
07/2023–current	Co-Principal investigator of NSF OAC grant 2310548 "Elements: An initial value solver for the era of multi-messenger astrophysics" (USD 597,233, 3 yrs)
04/2020–current	Principal investigator of NSF OAC grant 2004879 "The Einstein Toolkit ecosystem: Enabling fundamental research in the era of multi-messenger astrophysics" (USD 683,514, 4 yrs)
07/2016–06/2022	Co-principal investigator of NSF OAC grant 1550514 "Einstein Toolkit Community Integration and Data Exploration" (USD 450,000, 6 yrs)

Computer time grants

10/2020–current	Principal investigator of NSF XRAC grant TG-PHY160053 "Convergence of Numerical Relativity and Deep Learning for Gravitational Wave Astrophysics" (USD 406,798, ongoing)
06/2016–12/2021	Blue Waters "Illinois" allocations (USD 2.0 million)

Awards and fellowships

2010–2012	NSERC postdoctoral Fellowship (USD 80,000)
2006–2008	NSERC postgraduate scholarship (CAD 41,000)
2005	Ontario Graduate Scholarship (CAD 15,000)
2005	Governor General's Academic Medal *Awarded by the Governor General to the student graduating with the highest average from a university program*

Presentations

06/2024	Presenter, North American Einstein Toolkit Workshop 2024, Louisiana State University, Baton Rouge, LA
07/2023	Presenter, Einstein Toolkit Summer School, Rochester Institute of Technology, Rochester, NY
06/2022	Presenter, Einstein Toolkit Summer School, University of Idaho, Moscow, ID

08/2020	Presenter, North American Einstein Toolkit Workshop, Louisiana State University, Baton Rouge, LA
09/2019	Presenter, European Einstein Toolkit Meeting, King's College London, London, UK
06/2019	Presenter, North American Einstein Toolkit workshop, Rochester Institute of Technology, Rochester, NY
09/2018	Presenter, European Einstein Toolkit Workshop, University of Lisbon, Lisbon, Portugal
07/2018	Presenter, North American Einstein Toolkit workshop, Georgia Tech, Atlanta, GA
06/2018	Presenter, Mexican Einstein Toolkit school, Tecnológico de Monterrey, Guadalajaraa
10/2017	Presenter, EU Einstein Toolkit 2017 & EdFest, Universitat de les Illes Balears, Palma
02/2017	Participant, Workshop on MHD method in the Einstein Toolkit, Columbia University, New York, NY
06/2016	Participant, Einstein Toolkit EU School and Workshop, University of Trento, Trento
08/2015	Participant, ET Workshop 2015, University of Stockholm, Stockholm
10/2012	Participant, ET Workshop Fall, Rochester Institute of Technology, Rochester, NY
04/2012	Presenter, the EinsteinToolkit workshop at the APS meeting in Atlanta

Academic Service

Conference and summer schools

06/2023	Co-Organizer, North American Einstein Toolkit Workshop, Louisiana State University, Baton Rouge, LA
07/2023	Lead organizer, Einstein Toolkit CSSI Working Workshop, Rochester Institute of Technology, Rochester, NY
07/2022	Lead organizer, Einstein Toolkit CSSI Working Workshop, University of Illinois, Urbana, IL
06/2022	Co-organizer, Einstein Toolkit Summer School, University of Idaho, Moscow, ID
07/2021	Lead organizer, Einstein Toolkit Summer School, University of Illinois, Urbana, IL
09/2019	Scientific organization committee member, European Einstein Toolkit Meeting, King's College London, London, UK
10/2018	Co-organizer, Deep Learning for Multimessenger Astrophysics: Real-time Discovery at Scale workshop, University of Illinois, Urbana, IL
07/2018	Scientific organization committee member, North American Einstein Toolkit workshop, Georgia Tech, Atlanta, GA
06/2018	Organization committee member, Mexican Einstein Toolkit school, Tecnológico de Monterrey, Guadalajaraa

07/2017	Lead organizer of the EinsteinToolkit workshop at the NCSA / UIUC meeting in Urbana-Champaign
07/2015	Local organizing committee member, CGWAS Caltech Gravitatioanl Wave Astrophysics School, Caltech, Pasadena, CA
06/2014	Co-organizer, Capra Meeting on Radiation Reaction in General Relativity, Caltech, Pasadena, CA
07/2013	Organizer of the Einstein Toolkit Summer Workshop at Caltech, where all maintainer met to discuss future directions of the project.
07/2013	Local organizing committee member and presenter, CGWAS Caltech Gravitatioanl Wave Astrophysics School, Caltech, Pasadena, CA
2012–2014	Organizer of the relativity section of the weekly TAPIR seminars.
04/2012	Co-organizer of the EinsteinToolkit workshop at the APS meeting in Atlanta
04/2009	Session chair Numerical Simulations of Black holes and Neutron Stars, April APS meeting, Washington DC.
2008–current	Maintainer of the Einstein Toolkit, a collaborative NSF funded effort by LSU, NCSA, RIT, Georgia Tech, and Caltech to provide robust simulation codes for numerical relativity and numerical astrophysics.

Generic

02/2023–current	NCSA representative on OpenMP Architecture review board
10/2016	Observer, ExaHyPE consortium meeting, LRZ, Garching

Reviewer

2016–current	Reviewer NSF, STFC
2007–current	Referee for JOSS, PRD, PRL, and CQG.

Software

- "Einstein Toolkit", https://einsteintoolkit.org, lead PI since 2019
- "Cactus Computational Toolkit", https://cactuscode.org
- "Carpet mesh refinement driver", https://github.com/EinsteinToolkit/Carpet
- "CarpetX mesh refinement driver", https://github.com/EinsteinToolkit/CarpetX
- "Outflow", https://github.com/rhaas80/Outflow
- "ReadInterpolate", https://github.com/rhaas80/ReadInterpolate
- "GRHydro", https://bitbucket.org/einsteintoolkit/einsteinevolve
- "IllinoisGRMHD", https://bitbucket.org/zach_etienne/wvuthorns
- "Simulation Factory", https://bitbucket.org/simfactory/simfactory2

- ○ "Eccentricity reduction for NR simulations", `https://github.com/ncsagravity/eccred`
- ○ "SpEC", `https://www.black-holes.org/code/SpEC.html`
- ○ "mpitar", `https://git.ncsa.illinois.edu/rhaas/mpitar`
- ○ "parfu", `https://github.com/ncsa/parfu_archive_tool`
- ○ "pa_volume", `https://github.com/rhaas80/pa_volume`
- ○ Einstein Toolkit Summer School 2021 website, `https://github.com/EinsteinToolkit/et2021uiuc`
- ○ Einstein Toolkit CI testing service, `https://github.com/EinsteinToolkit/tests/tree/scripts`

Memberships

2025–current	CHIME collaboration
2018–current	Associate member, LISA Science Collaboration
2016–current	Association for Computing Machinery
2018–2021	Full member, LISA Science Collaboration
2014–2021	Deutsche Physikalische Gesellschaft
2011–2020	Member, LIGO Science Collaboration
2011–current	Simulating eXtreme Spacetimes
2008–current	Einstein Toolkit
2008–current	American Physical Society

Postdocs mentored

- ○ Alexandru Dima. Postdoc. Numerical relativity.
- ○ Deborah Ferguson. Postdoc. Numerical relativity and gravitational wave data analysis.

Students mentored

Graduate Students

- ○ Annamalai P S. Graduate Student. Project: Light propagation and polarization effects in Kerr spacetime. University of Southern Denmark.
- ○ Domnica Garzon. Graduate Student. Project: Higher order modes in gravitational waves of eccentric, precessing binary black hole mergers.
- ○ Semih Kacmaz. Graduate Student. Project: Machine learning-driven conservative-to-primitive conversion.
- ○ Cheng-Hsin Cheng. Graduate Student. Project: Binary Black Hole Mergers in a Massive Scalar Field Cloud.
- ○ Maxwell Rizzo. Graduate Students. Project: Initial data reader for COCAL in the Einstein Toolkit.

- Beyhan Karakaş. Graduate Student. Project: Effect of spin on binary neutron star mergers. University of Southampton.
- Yufeng Luo. Graduate Student. Project: Stability of rotating neutron stars. University of Wyoming.
- Shawn Rosofksy. Graduate Student. Project: binary neutron star inspirals with Cactus.
- Jonas Lippuner. Graduate Student. Project: binary neutron star inspirals with SpEC.
- Sherwood Richers. Graduate Student. Project: Neutrino Transport in Supernova Simulations.
- Jeffrey Kaplan. Graduate Student. Project: binary neutron star inspirals with SpEC.

Undergraduate Students

- Dhruv Srivastava. Undergraduate researcher in 2024. Improving quality of Einstein Toolkit binary black hole simulations.
- Amrutaa Vibho. Undergraduate researcher in 2023 – 2025. Numerical relativity simulations of eccentric binary black hole mergers.
- Chirag Maheshwari. Undergraduate researcher in 2023. Automating simulation monitoring for the Einstein Toolkit.
- Ashley Turner. Undergraduate researcher in 2023. Adding an OpenPMD reader module to VisIt visualization tool.
- Lisa Leung. Undergraduate researcher in 2022. Improving quality of Einstein Toolkit binary black hole simulations.
- Hrishikesh Kalyanaraman. Undergraduate researcher in 2022. Continuous integration testing for the Einstein Toolkit.
- Nadine Kuo. Undergraduate researcher in 2022. Continuous integration testing for the Einstein Toolkit.
- Parth Tiyagi. Undergraduate researcher in 2021. On the fly training data generation for large scale artificial neural network based gravitational waveform searches.
- Mingxin Li. Undergraduate researcher in 2021. Improving performance of characterizing numerical relativity waveforms.
- Mohammed Jamil. Undergraduate researcher in 2020. Using GitHub action for continuous integration testing of the Einstein Toolkit.
- Nuocheng Pan. Undergraduate researcher in 2020. Improving the robustness of the ENIGMA waveform generation code.
- Robert Nagel. Undergraduate researcher in 2020. Constructing a uniform framework to characterize numerical relativity waveforms.
- Yufeng Luo. Undergraduate researcher in 2019. DataVault an opens storage infrastructure for results obtained using the Einstein Toolkit.
- Kaiwen Zhang. Undergraduate researcher in 2019. Improving the quality of gravitational waves produced using the Einstein Toolkit.

- Joseph Adamo. Undergraduate researcher in 2019. Incorporating the ENIGMA gravitational wave model into LALsuite.
- Bridgette Davey. Undergraduate researcher (INCLUSION) in 2019. Processing numerical relativity simulation results for use by LIGO.
- Brockton Brendal. Undergraduate researcher in 2019. Implementing methods to extrapolate gravitational waves to Scri+ in the NCSA POWER code.
- Bing-Jyun (Johnny) Tsao. Undergraduate researcher (SPIN) in 2019. Solving the Poisson equation on irregular domains.
- Zeran Zhu. Undergraduate researcher (SPIN) in 2018. Generic output routines for the Einstein Toolkit.
- Sarah Habib. Undergraduate researcher (INCLUSION) in 2018, 2019. Gauge invariant measurement of eccentricity in gravitational waves, implementing a method to reduce eccentricity in simulations using the Einstein Toolkit.
- Nicolas White. Undergraduate researcher (INCLUSION) in 2018. Incorporating the ENIGMA gravitational wave model into LALsuite.
- Debopam Sanyal. Undergraduate researcher (SPIN) in 2018. Comparing methods to extrapolate gravitational waves to Scri+
- Vedant Puri. Undergraduate researcher (SPIN) in 2017. Testing Scheduled Jacobi Relaxation methods for use in the Einstein Toolkit.
- Sibo Wang. Undergraduate researcher (SPIN) in 2017. Project: Using the Adams-Bashforth timestepper in Cactus.
- Pablo Brubeck. Undergraduate research fellow in 2017. Project: Producing initial data for Cactus using LORENE.
- Nikita Jain. Undergraduate researcher (SPIN) in 2017. Project: A GPU accelerated BSSN using GAMER.
- Daniel Johnson. Undergraduate researcher in 2017. Python Open-source Waveform ExtractoR: An open source, python package to monitor and post-process numerical relativity simulations.
- Wei Ren. Undergraduate researcher in 2017. Project: Extrapolating gravitational waves produced by the Einstein Toolkit to Scri+.
- Dhara Mehta. Undergraduate researcher (SPIN) in 2017. Project: Automatically prune and archive simulation results produced by the Einstein Toolkit.
- Cutter Coryell. Summer Undergraduate Research Fellowship (SURF) student in 2013. Project: Testing Fully Dynamical Adaptive Mesh Refinement in the Einstein Toolkit.
- Cheol Woo (Peter) Park. Summer Undergraduate Research Fellowship (SURF) student in 2012. Project: black hole perturbation theory and white dwarf disruption by an intermediate mass black hole.
- Hannah Klion. Summer Undergraduate Research Fellowship (SURF) student in 2012. Project: Gravitational Waves from Rapidly Rotating Core-Collapse Supernovae.

High-school Students

○ Adam Rebei. Interning high-school student. Project: Effect of higher order modes in gravitational waves of eccentric binary black hole mergers.

Lectures

○ Tutorial session on compiling the Einstein Toolkit at the Einstein Toolkit workshop at Lousiana State University, 2024.

○ Tutorial session on using the Einstein Toolkit at the Einstein Toolkit workshop at Rochester, 2023.

○ Tutorial session on using the Einstein Toolkit at the Einstein Toolkit workshop at Dublin, 2022.

○ Tutorial session on using the Einstein Toolkit at the Numerical Relativity Summer School at ICERM, 2022.

○ Tutorial session on using the Einstein Toolkit at the Einstein Toolkit workshop at UIdaho, 2022.

○ Tutorial session on using the Einstein Toolkit at the Einstein Toolkit workshop at LSU, 2020.

○ Tutorial session on using the Einstein Toolkit at the Einstein Toolkit workshop at RIT, 2019.

○ Tutorial session on using Python in HPC at the Blue Waters Symposium at Sunriver Resort, Sunriver, OR, 2019.

○ Lecture on using MPI and OpenMP at the PIRE Winter School at the University of Arizona, 2018.

○ Tutorial session on using adaptive mesh refinement at the EU Einstein Toolkit workshop in Lisbon, Portugal, 2018.

○ Tutorial session on using Jupyter notebooks at the Blue Waters Symposium at Sunriver Resort, Sunriver, OR, 2018.

○ Tutorial session on writing an analysis module at the Spring Einstein Toolkit workshop attached to the April APS meeting in Atlanta, 2012.

○ Tutorial session and introduction to the Einstein Toolkit at the Summer Einstein Toolkit workshop at the Caltech Gravitational-Wave Astrophysics School 2013.

Invited talks

○ "Using computational physics to study relativity and more", University of Guelph, ON, Colloquium presentation. September, 2023.

○ "Present and future astrophysics simulations using the Einstein Toolkit", University of Wyoming, WY, Colloquium presentation. December, 2021.

○ "Assessing confidence in numerical relativity waveforms of binary neutron star mergers", Nikhef, Amsterdam, Netherlands. Seminar talk. September, 2018.

- "Community astrophysics science with the Einstein Toolkit", UIUC, Urbana-Champaign, IL. Theoretical Astrophysics and General Relativity Seminar. September, 2017.
- "Update on binary neutron star merger simulations", Goethe-University, Frankfurt, Germany. Astro coffee. April, 2017.
- "Simulating multi-physics astrophysical problems using current and future codes", Leibnitz Rechenzentrum, Garching, Germany. ExaHYPe collaboration meeting. April, 2017.
- "Update on binary neutron star merger simulations", Max-Planck-Institute for Gravitational Physics, Golm, Germany. AEI Seminar. April, 2016.
- "Core collapse and binary neutron star inspiral simulation using multipatch grids", University of Southampton, Southampton, UK. Gravity Seminar. February, 2015.
- "Three-Dimensional General-Relativistic Hydrodynamic Simulations of Binary Neutron Star Coalescence and Stellar Collapse with Multipatch Grids", UIUC, Urbana-Champaign, IL. Theoretical Astrophysics and General Relativity Seminar. April, 2013.
- "Gravitational and electromagnetic signatures from the tidal disruption of stars", Caltech, Pasadena, CA. CaJAGWR Seminars. April, 2012.

Contributed talks and posters

- "Astrophysics simulations using the Einstein Toolkit", University of Illinois, Urbana-Champaign, IL. AstroFest, 2024
- "HydroOpenMPToy status", King's College London, London, UK. Einstein Toolkit Workshop. September, 2019
- "Deep Learning at Scale: A Paradigm Shift for Multi-Messenger Astrophysics", Sunriver, Oregon. APS April Meeting. June, 2019
- "The NCSA eccentric gravitational waveform catalog", Denver, CO. APS April Meeting. April, 2019
- "Multimessenger Astronomy at the University of Illinois", Sunriver, Oregon. Blue Waters Symposium. June, 2018
- "Magnetic Field Amplification in Binary Neutron Star Merger Remnants", Sunriver, Oregon. Blue Waters Symposium. June, 2018
- "Multimessenger Astronomy at the University of Illinois", Sunriver, Oregon. Blue Waters Symposium. June, 2018
- "BOSS-LDG using Blue Waters for LIGO data analysis", Columbus, OH. APS April Meeting. April, 2018
- "Assessing confidence in numerical relativity waveforms of binary neutron star mergers", Columbus, Ohio. APS April Meeting. April, 2018
- "HydroOpenMPToy status", University des Illes Baleares, Palma, Spain. Einstein Toolkit Workshop. October 2017.
- "Benchmarking Parallelized File Aggregation Tools for Large Scale Data Management", Denver, CO. Supercomputing 2017, November 2017.

- "Neutron star simulations with SpEC", University of Stockholm, Stockholm, Sweden. MICRA meeting. August, 2015
- "Postprocrocessing data in Cactus", University of Stockholm, Stockholm, Sweden. Einstein Toolkit Workshop. June, 2015
- "Binary Neutron Star simulations using SpEC", University of Thessaloniki, Thessaloniki, Greece. Workshop on Binary Neutron Star Mergers. May, 2015
- "Binary Neutron Star simulations using SpEC", UCSD, San Diego, CA. Pacific Coast Gravity Meeting. March, 2014
- "Binary Neutron Star simulations using SpEC", Savannah, GA. APS April Meeting. April, 2014
- "Self-force driven inspiral of a scalar point particle into a Schwarzschild black hole", UCLA, Los Angeles, CA. TASC Meeting 2013. December, 2013
- "Binary NS simulations using SpEC", Uniwersytet Warszawski, Warsaw, Poland. Amaldi meeting. July, 2013
- "Binary NS simulations using SpEC", Denver, CO. APS April Meeting. April, 2013
- "Binary NS simulations using SpEC", UCD, Davis, CA. Pacific Coast Gravity Meeting. March, 2013
- "Binary NS simulations using SpEC", Carnegie Observatories, Pasadena, CA. TASC Meeting 2012. November, 2012
- "Self-force driven inspiral of a scalar point particle into a Schwarzschild black hole: a progress report", University of Maryland, Collega Park, MD. Capra Meeting on Radiation Reaction in General Relativity. June, 2012
- "Progress report: Binary NS simulations using SpEC", Atlanta, GA. APS April Meeting. April, 2012
- "Self-force driven inspiral of a scalar point particle into a Schwarzschild black hole", UCSB, Sata-Barbara, CA. Pacific Coast Gravity Meeting. March, 2012
- "Gravitational and Electromagnetic Signatures from the Tidal Disruption of a White Dwarf by an Intermediate Mass Black Hole", Florida Atlantic University. Boca Raton, FL. Gulf Coast Gravity Meeting. May, 2011
- "Gravitational and Electromagnetic Signatures from the Tidal Disruption of a White Dwarf by an Intermediate Mass Black Hole", Anaheim, CA. APS April Meeting. May, 2011
- "Progress Report: Gravitational and Electromagnetic Signatures from Tidal Disruption of a White Dwarf by an Intermediate Mass Black Hole", North Carolina State University, Raleigh, NC. Eastern Gravity Meeting. May, 2010
- "Gravitational and Electromagnetic Signatures from the Tidal Disruption of a White Dwarf by an Intermediate Mass Black Hole", Washington, DC. APS April Meeting. February, 2010
- "Black Hole - Neutron Star Binary Simulations at Georgia Tech", Louisiana State University, Baton Rouge, LA. Gulf Coast Gravity Meeting. April, 2009

- "Electromagnetic self-force for eccentric orbits in Schwarzschild spacetime", CNRS, Orleans, France. Capra meeting on Radiation Reaction, June, 2008
- "Electromagnetic self-force for eccentric orbits in Schwarzschild spacetime: A progress report", St. Louis University, St Louis, MO. Midwest Relativity Meeting, November, 2007
- "Scalar self-force for eccentric orbits in Schwarzschild spacetime", University of Alabama, Huntsville, AL. Capra meeting on Radiation Reaction, June, 2007
- "Scalar self-force for eccentric orbits in Schwarzschild spacetime", University of New Brunswick, Fredericton, NB. Canadian Conference on General Relativity and Relativistic Astrophysics, May, 2007
- "Scalar self-force for eccentric orbits in Schwarzschild spacetime", Washington University, St Louis, MO. Midwest Relativity Meeting, November, 2006

Publications

	Scopus	Google Scholar	... since 2020
Citations	5123	7912	4857
h-index	39	44	35
i10-index	N/A	68	65

legend: <u>student supervised</u>, (∗) - more than 100 citations

Short author list papers

[1] Kalinani, J. V., Ji, L., Ennoggi, L., et al., "AsterX: a new open-source GPU-accelerated GRMHD code for dynamical spacetimes," Classical and Quantum Gravity, 42, 025016 (2025).

[2] <u>Luo, Y.</u>, Tsokaros, A., Haas, R., & Uryū, K., "General Relativistic Stability and Gravitational Wave Content of Rotating Triaxial Neutron Stars," Symmetry, 16, 343 (2024).

[3] <u>Luo, Y.</u>, Tsokaros, A., Haas, R., & Uryū, K., "General Relativistic Stability and Gravitational Wave Content of Rotating Triaxial Neutron Stars," Symmetry, 16, 343 (2024).

[4] Park, H., Patel, P., Haas, R., & Huerta, E. A., "APACE: AlphaFold2 and advanced computing as a service for accelerated discovery in biophysics," Proceedings of the National Academy of Science, 121, e2311888121 (2024).

[5] Kumar, R., Dexheimer, V., Jahan, J., et al., "Theoretical and experimental constraints for the equation of state of dense and hot matter," Living Reviews in Relativity, 27, 3 (2024).

[6] <u>Luo, Y.</u>, Zhang, Q., Haas, R., Etienne, Z. B., & Allen, G., "HPC-driven computational reproducibility in numerical relativity codes: a use case study with IllinoisGRMHD," Classical and Quantum Gravity, 41, 025002 (2024).

[7] Curtis, S., Bosch, P., Mösta, P., et al., "Magnetized Outflows from Short-lived Neutron Star Merger Remnants Can Produce a Blue Kilonova," ApJL, 961, L26 (2024).

[8] Foucart, F., Duez, M. D., Haas, R., et al., "General relativistic simulations of collapsing binary neutron star mergers with Monte Carlo neutrino transport," PhRvD, 107, 103055 (2023).

[9] Joshi, A. V., Rosofsky, S. G., Haas, R., & Huerta, E. A., "Numerical relativity higher order gravitational waveforms of eccentric, spinning, nonprecessing binary black hole mergers," PhRvD, 107, 064038 (2023).

[10] Werneck, L. R., Etienne, Z. B., Murguia-Berthier, A., et al., "Addition of tabulated equation of state and neutrino leakage support to IllinoisGRMHD," PhRvD, 107, 044037 (2023).

[11] Shankar, S., Mösta, P., Brandt, S. R., et al., "GRaM-X: a new GPU-accelerated dynamical spacetime GRMHD code for Exascale computing with the Einstein Toolkit," Classical and Quantum Gravity, 40, 205009 (2023).

[12] (∗) Radice, D., Bernuzzi, S., Perego, A., & Haas, R., "A new moment-based general-relativistic neutrino-radiation transport code: Methods and first applications to neutron star mergers," MNRAS, 512, 1499 (2022).

[13] Chen, Z., Huerta, E. A., Adamo, J., et al., "Observation of eccentric binary black hole mergers with second and third generation gravitational wave detector networks," PhRvD, 103, 084018 (2021).

[14] Zhang, X., Achilles, S., Winkelmann, J., et al., "Solving the Bethe-Salpeter equation on massively parallel architectures," Computer Physics Communications, 267, 108081 (2021).

[15] Luo, Y., Haas, R., Zhang, Q., & Allen, G., "DataVault: a data storage infrastructure for the Einstein Toolkit," Classical and Quantum Gravity, 38, 135016 (2021).

[16] Tsao, B.-J., Haas, R., & Tsokaros, A., "Source term method for binary neutron stars initial data," Classical and Quantum Gravity, 38, 135008 (2021).

[17] Habib, S., Ramos-Buades, A., Huerta, E. A., et al., "Initial data and eccentricity reduction toolkit for binary black hole numerical relativity waveforms," Classical and Quantum Gravity, 38, 125007 (2021).

[18] Wei, W., Huerta, E. A., Yun, M., et al., "Deep Learning with Quantized Neural Networks for Gravitational-wave Forecasting of Eccentric Compact Binary Coalescence," ApJ, 919, 82 (2021).

[19] Etienne, Z. B., Paschalidis, V., Haas, R., Moesta, P., & Shapiro, S. L., "Illinois-GRMHD: GRMHD code for dynamical spacetimes," Astrophysics Source Code Library, ascl:2004.003 (2020).

[20] (∗) Ossokine, S., Buonanno, A., Marsat, S., et al., "Multipolar effective-one-body waveforms for precessing binary black holes: Construction and validation," PhRvD, 102, 044055 (2020).

[21] Vincent, T., Foucart, F., Duez, M. D., et al., "Unequal mass binary neutron star simulations with neutrino transport: Ejecta and neutrino emission," PhRvD, 101, 044053 (2020).

[22] (∗) Mösta, P., Radice, D., Haas, R., Schnetter, E., & Bernuzzi, S., "A Magnetar Engine for Short GRBs and Kilonovae," ApJL, 901, L37 (2020).

[23] Huerta, E. A., Haas, R., Habib, S., et al., "Physics of eccentric binary black hole mergers: A numerical relativity perspective," PhRvD, 100, 064003 (2019).

[24] Rebei, A., Huerta, E. A., Wang, S., et al., "Fusing numerical relativity and deep learning to detect higher-order multipole waveforms from eccentric binary black hole mergers," PhRvD, 100, 044025 (2019).

[25] Foucart, F., Duez, M. D., Hinderer, T., et al., "Gravitational waveforms from spectral Einstein code simulations: Neutron star-neutron star and low-mass black hole-neutron star binaries," PhRvD, 99, 044008 (2019).

[26] Huerta, E. A., Allen, G., Andreoni, I., et al., "Enabling real-time multi-messenger astrophysics discoveries with deep learning," Nature Reviews Physics, 1, 600 (2019).

[27] Huerta, E. A., Haas, R., Jha, S., Neubauer, M., & Katz, D. S., "Supporting High-Performance and High-Throughput Computing for Experimental Science," Computing and Software for Big Science, 3, 5 (2019).

[28] Hossein Nouri, F., Duez, M. D., Foucart, F., et al., "Evolution of the magnetized, neutrino-cooled accretion disk in the aftermath of a black hole-neutron star binary merger," PhRvD, 97, 083014 (2018).

[29] Hossein Nouri, F., Duez, M. D., Foucart, F., et al., "Evolution of the magnetized, neutrino-cooled accretion disk in the aftermath of a black hole-neutron star binary merger," PhRvD, 97, 083014 (2018).

[30] (∗) Huerta, E. A., Moore, C. J., Kumar, P., et al., "Eccentric, nonspinning, inspiral, Gaussian-process merger approximant for the detection and characterization of eccentric binary black hole mergers," PhRvD, 97, 024031 (2018).

[31] Johnson, D., Huerta, E. A., & Haas, R., "Python Open source Waveform ExtractoR (POWER): an open source, Python package to monitor and post-process numerical relativity simulations," Classical and Quantum Gravity, 35, 027002 (2018).

[32] (∗) Mösta, P., Roberts, L. F., Halevi, G., et al., "r-process Nucleosynthesis from Three-dimensional Magnetorotational Core-collapse Supernovae," ApJ, 864, 171 (2018).

[33] (∗) Ott, C. D., Roberts, L. F., da Silva Schneider, A., et al., "The Progenitor Dependence of Core-collapse Supernovae from Three-dimensional Simulations with Progenitor Models of 12-40 M $_\odot$," ApJL, 855, L3 (2018).

[34] Fedrow, J. M., Ott, C. D., Sperhake, U., et al., "Gravitational Waves from Binary Black Hole Mergers inside Stars," PhRvL, 119, 171103 (2017).

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