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Roland Haas

Curriculum vitae

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Professional Experience

07/2016–current **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

Professional Activities

07/2022 Lead organizer, Einstein Toolkit CSSI Working Workshop, University of Illinois, Urbana, IL

06/2022 Co-organizer and presenter, Einstein Toolkit Summer School, University of Idaho, Moscow, ID

07/2021 Lead organizer, Einstein Toolkit Summer School, University of Illinois, Urbana, IL

08/2020 Presenter, North American Einstein Toolkit Workshop, Louisiana State University, Baton Rouge, LA

09/2019 Presenter and scientific organization committee member, European Einstein Toolkit Meeting, King's College London, London, UK

06/2019 Presenter, North American Einstein Toolkit workshop, Rochester Institute of Technology, Rochester, NY

10/2018 Co-organizer, Deep Learning for Multimessenger Astrophysics: Real-time Discovery at Scale workshop, University of Illinois, Urbana, IL

09/2018 Presenter, European Einstein Toolkit Workshop, University of Lisbon, Lisbon, Portugal

07/2018 Presenter and scientific organization committee member, North American Einstein Toolkit workshop, Georgia Tech, Atlanta, GA

06/2018 Presenter and organization committee member, Mexican Einstein Toolkit school, Tecnológico de Monterrey, Guadalajaraa

10/2017 Presenter, EU Einstein Toolkit 2017 & EdFest, Universitat de les Illes Balears, Palma

07/2017 Lead organizer of the EinsteinToolkit workshop at the NCSA / UIUC meeting in Urbana-Champaign

02/2017 Participant, Workshop on MHD method in the Einstein Toolkit, Columbia University, New York, NY

10/2016 Observer, ExaHyPE consortium meeting, LRZ, Garching

06/2016 Participant, Einstein Toolkit EU School and Workshop, University of Trento, Trento

08/2015 Participant, ET Workshop 2015, University of Stockholm, Stockholm

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.

10/2012 Participant, ET Workshop Fall, Rochester Institute of Technology, Rochester, NY

04/2012 Presenter and co-organizer of the EinsteinToolkit workshop at the APS meeting in Atlanta

2011–2020 Member, LIGO Science Collaboration

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.

2007–current Referee for JOSS, PRD, PRL, and CQG.

Grants and Awards

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 450,000, 6 yrs)

07/2016–06/2022 Co-principal investigator of NSF OAC grant 1550514 "Einstein Toolkit Community Integration and Data Exploration" (USD 683,514, 4 yrs)

10/2020–current Principal investigator of NSF XRAC grant TG-PHY160053 "Convergence of Numerical Relativity and Deep Learning for Gravitational Wave Astrophysics"

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*

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

Students mentored

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

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

- Yufeng Luo. Undergraduate researcher in 2019. DataVault an opens storage infrastructure for results obtained using the Einstein Toolkit.
- Robert Nagel. Undergraduate researcher in 2020. Constructing a uniform framework to characterize numerical relativity waveforms.
- Nuocheng Pan. Undergraduate researcher in 2020. Improving the robustness of the ENIGMA waveform generation code.
- Mohammed Jamil. Undergraduate researcher in 2020. Using GitHub action for continuous integration testing of the Einstein Toolkit.
- Mingxin Li. Undergraduate researcher in 2021. Improving performance of characterizing numerical relativity waveforms.
- Parth Tiyagi. Undergraduate researcher in 2021. On the fly training data generation for large scale artificial neural network based gravitational waveform searches.
- Hrishikesh Kalyanaraman. Undergraduate researcher in 2022. Continuous integration testing for the Einstein Toolkit.

Lectures

- 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.
- 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 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

- "Gravitational and electromagnetic signatures from the tidal disruption of stars", Caltech, Pasadena, CA. CaJAGWR Seminars. April, 2012.
- "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.

- "Core collapse and binary neutron star inspiral simulation using multipatch grids", University of Southampton, Southampton, UK. Gravity Seminar. February, 2015.
- "Update on binary neutron star merger simulations", Max-Planck-Institute for Gravitational Physics, Golm, Germany. AEI Seminar. April, 2016.
- "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", Goethe-University, Frankfurt, Germany. Astro coffee. April, 2017.
- "Community astrophysics science with the Einstein Toolkit", UIUC, Urbana-Champaign, IL. Theoretical Astrophysics and General Relativity Seminar. September, 2017.
- "Assessing confidence in numerical relativity waveforms of binary neutron star mergers", Nikhef, Amsterdam, Netherlands. Seminar talk. September, 2018.

Contributed talks and posters

- "HydroOpenMPToy status", King's College London, London, UK. Einstein Toolkit Workshop. September, 2019
- "The NCSA eccentric gravitational waveform catalog", Denver, Colorado. APS April Meeting. April, 2019
- "The NCSA eccentric gravitational waveform catalog", Denver, CO. APS April Meeting. April, 2019
- "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.
- "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 2016
Citations	3488	5106	3872
h-index	34	38	33
i10-index	N/A	55	53

[1] 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).

[2] Steffen, C. P., Haas, R., Kendig, K., Mainzer, L., Chui, R., Fliege, C, "Efficient Software for Archiving and Retrieving Results of Massive Bioinformatics Analyses in High-Performance Computing Environments", Proceedings of the 8th International Workshop on HPC User Support Tools (HUST 2021) held in conjunction with SC 21, (2021).

[3] 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).

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

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

[6] 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).

[7] 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).

[8] Haas, R., Brandt, S. R., Gabella, W. E., et al., "The Einstein Toolkit," Zenodo, (2020).

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

[10] 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).

[11] Brandt, S. R., Brendal, B., Gabella, W. E., et al., "The Einstein Toolkit," Zenodo, (2020).

[12] 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).

[13] 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).

[14] Babiuc-Hamilton, M., Brandt, S. R., Diener, P., et al., "The Einstein Toolkit," Zenodo, (2019).

[15] 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).

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

[17] 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).

[18] 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).

[19] Allen, G., Andreoni, I., Bachelet, E., et al., "Deep Learning for Multi-Messenger Astrophysics: A Gateway for Discovery in the Big Data Era," arXiv e-prints, arXiv:1902.00522 (2019).

[20] Markakis, C. M., O'Boyle, M. F., Glennon, D., et al., "Time-symmetry, symplecticity and stability of Euler-Maclaurin and Lanczos-Dyche integration," arXiv e-prints, arXiv:1901.09967 (2019).

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

[22] Belkin, M., Haas, R., Arnold, G. W., et al., "Container solutions for HPC Systems: A Case Study of Using Shifter on Blue Waters," arXiv e-prints, arXiv:1808.00556 (2018).

[23] Arzoumanian, Z., Baker, P. T., Brazier, A., et al., "The NANOGrav 11 Year Data Set: Pulsar-timing Constraints on the Stochastic Gravitational-wave Background," ApJ, 859, 47 (2018).

[24] 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).

[25] 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).

[26] 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).

[27] 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).

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

[29] Nouri, F. H., 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," arXiv e-prints, arXiv:1710.07423 (2017).

[30] Huerta, E. A., Haas, R., Fajardo, E., et al., "BOSS-LDG: A Novel Computational Framework that Brings Together Blue Waters, Open Science Grid, Shifter and the LIGO Data Grid to Accelerate Gravitational Wave Discovery," arXiv e-prints, arXiv:1709.08767 (2017).

[31] Huerta, E. A., Kumar, P., Agarwal, B., et al., "Complete waveform model for compact binaries on eccentric orbits," PhRvD, 95, 024038 (2017).

[32] Roberts, L. F., Ott, C. D., Haas, R., et al., "General-Relativistic Three-Dimensional Multi-group Neutrino Radiation-Hydrodynamics Simulations of Core-Collapse Supernovae," ApJ, 831, 98 (2016).

[33] Tacik, N., Foucart, F., Pfeiffer, H. P., et al., "Erratum: Binary neutron stars with arbitrary spins in numerical relativity [Phys. Rev. D 92, 124012 (2015)]," PhRvD, 94, 049903 (2016).

[34] Haas, R., Ott, C. D., Szilagyi, B., et al., "Simulations of inspiraling and merging double neutron stars using the Spectral Einstein Code," PhRvD, 93, 124062 (2016).

[35] Barkett, K., Scheel, M. A., Haas, R., et al., "Gravitational waveforms for neutron star binaries from binary black hole simulations," PhRvD, 93, 044064 (2016).

[36] Tacik, N., Foucart, F., Pfeiffer, H. P., et al., "Binary neutron stars with arbitrary spins in numerical relativity," PhRvD, 92, 124012 (2015).

[37] Etienne, Z. B., Paschalidis, V., Haas, R., Mösta, P., & Shapiro, S. L., "Illinois-GRMHD: an open-source, user-friendly GRMHD code for dynamical spacetimes," Classical and Quantum Gravity, 32, 175009 (2015).

[38] Abdikamalov, E., Ott, C. D., Radice, D., et al., "Neutrino-driven Turbulent Convection and Standing Accretion Shock Instability in Three-dimensional Core-collapse Supernovae," ApJ, 808, 70 (2015).

[39] Foucart, F., O'Connor, E., Roberts, L., et al., "Post-merger evolution of a neutron star-black hole binary with neutrino transport," PhRvD, 91, 124021 (2015).

[40] Foucart, F., Deaton, M. B., Duez, M. D., et al., "Neutron star-black hole mergers with a nuclear equation of state and neutrino cooling: Dependence in the binary parameters," PhRvD, 90, 024026 (2014).

[41] Mösta, P., Richers, S., Ott, C. D., et al., "Magnetorotational Core-collapse Supernovae in Three Dimensions," ApJL, 785, L29 (2014).

[42] Mösta, P., Mundim, B. C., Faber, J. A., et al., "GRHydro: a new open-source general-relativistic magnetohydrodynamics code for the Einstein toolkit," Classical and Quantum Gravity, 31, 015005 (2014).

[43] Vega, I., Wardell, B., Diener, P., Cupp, S., & Haas, R., "Scalar self-force for eccentric orbits around a Schwarzschild black hole," PhRvD, 88, 084021 (2013).

[44] Reisswig, C., Ott, C. D., Abdikamalov, E., et al., "Formation and Coalescence of Cosmological Supermassive-Black-Hole Binaries in Supermassive-Star Collapse," PhRvL, 111, 151101 (2013).

[45] Shcherbakov, R. V., Pe'er, A., Reynolds, C. S., et al., "GRB060218 as a Tidal Disruption of a White Dwarf by an Intermediate-mass Black Hole," ApJ, 769, 85 (2013).

[46] Ott, C. D., Abdikamalov, E., Mösta, P., et al., "General-relativistic Simulations of Three-dimensional Core-collapse Supernovae," ApJ, 768, 115 (2013).

[47] Moesta, P., Mundim, B., Faber, J., et al., "General relativistic magneto-hydrodynamics with the Einstein Toolkit," APS April Meeting Abstracts, 2013, X10.001 (2013).

[48] Reisswig, C., Haas, R., Ott, C. D., et al., "Three-dimensional general-relativistic hydrodynamic simulations of binary neutron star coalescence and stellar collapse with multipatch grids," PhRvD, 87, 064023 (2013).

[49] Zimmerman, P., Vega, I., Poisson, E., & Haas, R., "Self-force as a cosmic censor," PhRvD, 87, 041501 (2013).

[50] Hinder, I., Buonanno, A., Boyle, M., et al., "Error-analysis and comparison to analytical models of numerical waveforms produced by the NRAR Collaboration," Classical and Quantum Gravity, 31, 025012 (2013).

[51] Healy, J., Bode, T., Haas, R., et al., "Late inspiral and merger of binary black holes in scalar-tensor theories of gravity," Classical and Quantum Gravity, 29, 232002 (2012).

[52] Ott, C. D., Abdikamalov, E., O'Connor, E., et al., "Correlated gravitational wave and neutrino signals from general-relativistic rapidly rotating iron core collapse," PhRvD, 86, 024026 (2012).

[53] Löffler, F., Faber, J., Bentivegna, E., et al., "The Einstein Toolkit: a community computational infrastructure for relativistic astrophysics," Classical and Quantum Gravity, 29, 115001 (2012).

[54] Haas, R., Shcherbakov, R. V., Bode, T., & Laguna, P., "Tidal Disruptions of White Dwarfs from Ultra-close Encounters with Intermediate-mass Spinning Black Holes," ApJ, 749, 117 (2012).

[55] Bode, T., Bogdanović, T., Haas, R., et al., "Mergers of Supermassive Black Holes in Astrophysical Environments," ApJ, 744, 45 (2012).

[56] Haas, R., "Time domain calculation of the electromagnetic self-force on eccentric geodesics in Schwarzschild spacetime," arXiv e-prints, arXiv:1112.3707 (2011).

[57] Bogdanović, T., Bode, T., Haas, R., Laguna, P., & Shoemaker, D., "Properties of accretion flows around coalescing supermassive black holes," Classical and Quantum Gravity, 28, 094020 (2011).

[58] Bode, T., Haas, R., Bogdanović, T., Laguna, P., & Shoemaker, D., "Relativistic Mergers of Supermassive Black Holes and Their Electromagnetic Signatures," ApJ, 715, 1117 (2010).

[59] Haas, R., "Self-force on point particles in orbit around a Schwarzschild black hole," Ph.D. Thesis, (2008).

[60] Haas, R., "Scalar self-force on eccentric geodesics in Schwarzschild spacetime: A time-domain computation," PhRvD, 75, 124011 (2007).

[61] Haas, R., & Poisson, E., "Mode-sum regularization of the scalar self-force: Formulation in terms of a tetrad decomposition of the singular field," PhRvD, 74, 044009 (2006).

[62] Haas, R., & Poisson, E., "Mass change and motion of a scalar charge in cosmological spacetimes," Classical and Quantum Gravity, 22, S739 (2005).