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Roland Haas

Curriculum vitae

Personal information

Name	Roland Haas
Date of birth	May 29th 1980
Place of birth	Herbolzheim
Nationality	German

Experience

07/2016–current **senior research programmer**, *NCSA*, Urbana, Advisors: Gabrielle Allen, Greg Bauer.
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

PhD thesis

title	*Self-force on point particles in orbit around a Schwarzschild black hole*
supervisors	Eric Poisson, University of Guelph, Canada

Master thesis

title	*Mass loss of a scalar charge in cosmological spacetimes*
supervisors	Eric Poisson, University of Guelph, Canada

Languages

German	native speaker
English	fluent
French	basic

Computer skills

Programming Languages	Fortran (77 and 90), C, C++, m68k assembly language, Perl, Python, Tcl, awk, shell-scripting, basic HTML, basic PHP, basic Javascript, LaTeX
Parallel code frameworks	MPI, OpenMP, basic CUDA
Application frameworks	Cactus computational toolkit, SpEC, PETSc
Version control	git, subversion, mercurial, darcs, cvs
Scientific software	numpy, h5py, matplotlib, gnuplot, VisIt, Paraview, doxygen
Operating systems	Linux (Debian, Ubuntu, RedHat), macOS, Windows (mostly XP, 95), AmigaOS
Infrastructure	Deployment and maintenance of apache-based group website, MediaWiki, centralized git and subversion repositories including customized web interface for user and repository management using Submin, setup of mailing lists using mailman and exim, user account management. Kubernetes, Docker and JupyterHub to run the Einstein Toolkit Tutorial server. Docker containers in HPC environments using Shifter.

Awards

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*

Memberships

2016–current	Association for Computing Machinery
2008–current	American Physical Society

Services

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 with 256 registered users at 176 different groups.
07/2017	Lead organizer of the EinsteinToolkit workshop at the NCSA / UIUC meeting in Urbana-Champaign
2012–2014	Organizer of the relativity section of the weekly TAPIR seminars.
07/2013	Organizer of the Einstein Toolkit Summer Workshop at Caltech, where all maintainer met to discuss future directions of the project.

2011 co-organizer of the EinsteinToolkit workshop at the APS meeting in Atlanta

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

04/2009 Session chair Numerical Simulations of Black holes and Neutron Stars, April APS meeting, Washington DC.

Lectures

- Tutorial session on using the Einstein Toolkit at the Einstein Toolkit workshop at RIT, 2019.
- 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. CaJAGWR Seminars.
- "Three-Dimensional General-Relativistic Hydrodynamic Simulations of Binary Neutron Star Coalescence and Stellar Collapse with Multipatch Grids", UIUC, Urbana-Champaign. Theoretical Astrophysics and General Relativity Seminar.
- "Community astrophysics science with the Einstein Toolkit", Urbana-Champaign. Theoretical Astrophysics and General Relativity Seminar.

Ongoing Grants

- Principal investigator of NSF OAC grant 2004879 "The Einstein Toolkit ecosystem: Enabling fundamental research in the era of multi-messenger astrophysics"
- Co-principal investigator of NSF OAC grant 1550514 "Einstein Toolkit Community Integration and Data Exploration"
- Principal investigator of NSF XRAC grant TG-PHY160053 "Convergence of Numerical Relativity and Deep Learning for Gravitational Wave Astrophysics"

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.

- 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 (INCLUDION) 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.
- Keiwen 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.

Publications

[1] Luo, Y., Haas, R., Zhang, Q., et al. 2020, arXiv:2012.06635

[2] Wei, W., Huerta, E. A., Yun, M., et al. 2020, arXiv:2012.03963

[3] Haas, R., Brandt, S. R., Gabella, W. E., et al. 2020, Zenodo

[4] Habib, S., Ramos-Buades, A., Huerta, E. A., et al. 2020, arXiv:2011.08878

[5] Tsao, B.-J., Haas, R., & Tsokaros, A. 2020, arXiv:2010.08733

[6] Mösta, P., Radice, D., Haas, R., et al. 2020, ApJL, 901, L37. doi:10.3847/2041-8213/abb6ef

[7] Chen, Z., Huerta, E. A., Adamo, J., et al. 2020, arXiv:2008.03313

[8] Ossokine, S., Buonanno, A., Marsat, S., et al. 2020, PhRvD, 102, 044055. doi:10.1103/PhysRevD.102.044055

[9] Brandt, S. R., Brendal, B., Gabella, W. E., et al. 2020, Zenodo

[10] Vincent, T., Foucart, F., Duez, M. D., et al. 2020, PhRvD, 101, 044053. doi:10.1103/PhysRevD.101.044053

[11] Babiuc-Hamilton, M., Brandt, S. R., Diener, P., et al. 2019, Zenodo

[12] Huerta, E. A., Allen, G., Andreoni, I., et al. 2019, Nature Reviews Physics, 1, 600. doi:10.1038/s42254-019-0097-4

[13] Huerta, E. A., Haas, R., Habib, S., et al. 2019, PhRvD, 100, 064003. doi:10.1103/PhysRevD.100.064003

[14] Rebei, A., Huerta, E. A., Wang, S., et al. 2019, PhRvD, 100, 044025. doi:10.1103/PhysRevD.100.044025

[15] Allen, G., Andreoni, I., Bachelet, E., et al. 2019, arXiv:1902.00522

[16] Foucart, F., Duez, M. D., Hinderer, T., et al. 2019, PhRvD, 99, 044008. doi:10.1103/PhysRevD.99.044008

[17] Markakis, C. M., O'Boyle, M. F., Glennon, D., et al. 2019, arXiv:1901.09967

[18] Mösta, P., Roberts, L. F., Halevi, G., et al. 2018, ApJ, 864, 171. doi:10.3847/1538-4357/aad6ec

[19] Belkin, M., Haas, R., Arnold, G. W., et al. 2018, arXiv:1808.00556

[20] Arzoumanian, Z., Baker, P. T., Brazier, A., et al. 2018, ApJ, 859, 47. doi:10.3847/1538-4357/aabd3b

[21] Hossein Nouri, F., Duez, M. D., Foucart, F., et al. 2018, PhRvD, 97, 083014. doi:10.1103/PhysRevD.97.083014

[22] Ott, C. D., Roberts, L. F., da Silva Schneider, A., et al. 2018, ApJL, 855, L3. doi:10.3847/2041-8213/aaa967

[23] Huerta, E. A., Moore, C. J., Kumar, P., et al. 2018, PhRvD, 97, 024031. doi:10.1103/PhysRevD.97.024031

[24] Johnson, D., Huerta, E. A., & Haas, R. 2018, Classical and Quantum Gravity, 35, 027002. doi:10.1088/1361-6382/aa9cad

[25] Nouri, F. H., Duez, M. D., Foucart, F., et al. 2017, arXiv:1710.07423

[26] Fedrow, J. M., Ott, C. D., Sperhake, U., et al. 2017, PhRvL, 119, 171103. doi:10.1103/PhysRevLett.119.171103

[27] Huerta, E. A., Haas, R., Fajardo, E., et al. 2017, arXiv:1709.08767

[28] Huerta, E. A., Kumar, P., Agarwal, B., et al. 2017, PhRvD, 95, 024038. doi:10.1103/PhysRevD.95.024038

[29] Roberts, L. F., Ott, C. D., Haas, R., et al. 2016, ApJ, 831, 98. doi:10.3847/0004-637X/831/1/98

[30] Tacik, N., Foucart, F., Pfeiffer, H. P., et al. 2016, PhRvD, 94, 049903. doi:10.1103/PhysRevD.94.049903

[31] Haas, R., Ott, C. D., Szilagyi, B., et al. 2016, PhRvD, 93, 124062. doi:10.1103/PhysRevD.93.124062

[32] Barkett, K., Scheel, M. A., Haas, R., et al. 2016, PhRvD, 93, 044064. doi:10.1103/PhysRevD.93.044064

[33] Tacik, N., Foucart, F., Pfeiffer, H. P., et al. 2015, PhRvD, 92, 124012. doi:10.1103/PhysRevD.92.124012

[34] Etienne, Z. B., Paschalidis, V., Haas, R., et al. 2015, Classical and Quantum Gravity, 32, 175009. doi:10.1088/0264-9381/32/17/175009

[35] Abdikamalov, E., Ott, C. D., Radice, D., et al. 2015, ApJ, 808, 70. doi:10.1088/0004-637X/808/1/70

[36] Foucart, F., O'Connor, E., Roberts, L., et al. 2015, PhRvD, 91, 124021. doi:10.1103/PhysRevD.91.124021

[37] Foucart, F., Deaton, M. B., Duez, M. D., et al. 2014, PhRvD, 90, 024026. doi:10.1103/PhysRevD.90.024026

[38] Mösta, P., Richers, S., Ott, C. D., et al. 2014, ApJL, 785, L29. doi:10.1088/2041-8205/785/2/L29

[39] Mösta, P., Mundim, B. C., Faber, J. A., et al. 2014, Classical and Quantum Gravity, 31, 015005. doi:10.1088/0264-9381/31/1/015005

[40] Reisswig, C., Ott, C. D., Abdikamalov, E., et al. 2013, PhRvL, 111, 151101. doi:10.1103/PhysRevLett.111.151101

[41] Vega, I., Wardell, B., Diener, P., et al. 2013, PhRvD, 88, 084021. doi:10.1103/PhysRevD.88.084021

[42] Shcherbakov, R. V., Pe'er, A., Reynolds, C. S., et al. 2013, ApJ, 769, 85. doi:10.1088/0004-637X/769/2/85

[43] Ott, C. D., Abdikamalov, E., Mösta, P., et al. 2013, ApJ, 768, 115. doi:10.1088/0004-637X/768/2/115

[44] Reisswig, C., Haas, R., Ott, C. D., et al. 2013, PhRvD, 87, 064023. doi:10.1103/PhysRevD.87.064023

[45] Zimmerman, P., Vega, I., Poisson, E., et al. 2013, PhRvD, 87, 041501. doi:10.1103/PhysRevD.87.041501

[46] Hinder, I., Buonanno, A., Boyle, M., et al. 2013, Classical and Quantum Gravity, 31, 025012. doi:10.1088/0264-9381/31/2/025012

[47] Healy, J., Bode, T., Haas, R., et al. 2012, Classical and Quantum Gravity, 29, 232002. doi:10.1088/0264-9381/29/23/232002

[48] Ott, C. D., Abdikamalov, E., O'Connor, E., et al. 2012, PhRvD, 86, 024026. doi:10.1103/PhysRevD.86.024026

[49] Löffler, F., Faber, J., Bentivegna, E., et al. 2012, Classical and Quantum Gravity, 29, 115001. doi:10.1088/0264-9381/29/11/115001

[50] Haas, R., Shcherbakov, R. V., Bode, T., et al. 2012, ApJ, 749, 117. doi:10.1088/0004-637X/749/2/117

[51] Bode, T., Bogdanović, T., Haas, R., et al. 2012, ApJ, 744, 45. doi:10.1088/0004-637X/744/1/45

[52] Haas, R. 2011, arXiv:1112.3707

[53] Bogdanović, T., Bode, T., Haas, R., et al. 2011, Classical and Quantum Gravity, 28, 094020. doi:10.1088/0264-9381/28/9/094020

[54] Bode, T., Haas, R., Bogdanović, T., et al. 2010, ApJ, 715, 1117. doi:10.1088/0004-637X/715/2/1117

[55] Haas, R. 2008, Ph.D. Thesis

[56] Haas, R. 2007, PhRvD, 75, 124011. doi:10.1103/PhysRevD.75.124011

[57] Haas, R. & Poisson, E. 2006, PhRvD, 74, 044009. doi:10.1103/PhysRevD.74.044009

[58] Haas, R. & Poisson, E. 2005, Classical and Quantum Gravity, 22, S739. doi:10.1088/0264-9381/22/15/008