

CONTACT INFORMATION	205 Lewis Hall University of Mississippi University, MS 38677-1848 USA	lcstein@olemiss.edu duetosymmetry.com 1-662-915-1941
EDUCATION	Ph.D., Physics , Massachusetts Institute of Technology, Cambridge, MA, USA Dissertation Advisor: Prof. Scott Hughes Dissertation Title: <i>Probes of strong-field gravity</i> B.S., Physics , California Institute of Technology, Pasadena, CA, USA Degree conferred with honor. Senior Thesis Advisors: Dr. Patrick Sutton and Prof. Alan Weinstein	May 2012 June 2006
EMPLOYMENT	Assistant Professor , University of Mississippi, Oxford, MS USA Senior Postdoctoral Researcher , Caltech, Pasadena, CA USA NASA Einstein Fellow , Cornell, Ithaca NY, USA Research and Teaching Assistant , MIT, Cambridge MA, USA Teaching Assistant , Caltech, Pasadena, CA, USA Summer Research Fellow , Caltech, Pasadena, CA, USA	August 2018–Present September 2015–August 2018 September 2012–August 2015 September 2006–May 2012 Fall 2004, Spring 2005 June–September 2003/2005
RESEARCH INTERESTS	General relativity (GR), gravitation, and astrophysical phenomena which can elucidate gravity. Recent work is focused on gravitational-wave predictions in beyond-GR theories of gravity. Work in progress and future work includes numerical simulations of black hole mergers in beyond-GR theories, cosmological signatures of beyond-GR theories, and investigations in near-horizon extremal Kerr.	
HONORS AND AWARDS	Einstein Postdoctoral Fellow , NASA Henry Kendall Teaching Award , Massachusetts Institute of Technology Upperclass Merit Scholarship , California Institute of Technology	2012–2015 2011 2005–2006
TEACHING EXPERIENCE	Guest Lecturer , California Institute of Technology Ph236, General relativity Ph237, Gravitational Waves Guest Lecturer , Massachusetts Institute of Technology 8.901, Graduate Astrophysics I Teaching Assistant , Massachusetts Institute of Technology 8.942, Cosmology 8.901, Graduate Astrophysics I 8.286, The Early Universe Teaching Assistant , California Institute of Technology	Fall 2017 Spring 2016 Spring 2011 Fall 2011 Spring 2011 Fall 2009

	Ph 7, Nuclear and Quantum Physics Lab	Spring 2005
	Ph 5, Analog Electronics for Physicists	Fall 2004
MENTORING	Graduate students	
	Maria (Masha) Okounkova, Caltech	Fall 2015–present
	Baoyi Chen, Caltech	Fall 2016–present
	Undergraduate students	
	Wayne Zhao, Harvard	Summer 2016
PROFESSIONAL ACTIVITIES, OUTREACH, AND SERVICE	Member, American Physical Society	2010–Present
	Division of Gravitational Physics	
	Executive Committee Member-at-Large	2016–2019
	Division of Astrophysics	
	Conference organizer	
	Workshop on Numerical Relativity beyond General Relativity , Benasque	June 2018
	Week-long international workshop, 59 participants	
	34 th Pacific Coast Gravity Meeting (PCGM), Caltech	March 2018
	Two-day conference, ~ 125 participants	
	Workshop on Unifying Tests of General Relativity , Caltech	July 2016
	Three day workshop, 52 participants	
	Seminar organizer	
	TAPIR seminar, Caltech	Fall 2015–Present
	General Relativity Informal Tea-Time Series (GRITTS), MIT	Fall 2011–Spring 2012
	MKI Journal Club, MIT	Fall 2007–Spring 2010
	Conference session chair; Judge for best student speaker award	
	April APS meeting, Columbus, OH	April 2018
	34 th Pacific Coast Gravity Meeting (PCGM), Caltech	March 2018
	33 rd Pacific Coast Gravity Meeting (PCGM), UCSB	March 2017
	“April” APS meeting, Washington D.C.	January 2017
	32 nd Pacific Coast Gravity Meeting (PCGM), CSU Fullerton	April 2016
	Theoretical Astrophysics in Southern California (TASC), CSU Fullerton	November 2015
	Journal referee	
	Journal of Cosmology and Astroparticle Physics, General Relativity and Gravitation, Monthly Notices of the Royal Astronomical Society, Physics Letters B, Physical Review D, Physical Review Letters, Physical Review X, Reviews of Modern Physics	
	Agency work	
	External reviewer for NSF, NASA	
	Outreach	
	Caltech astronomy public lecture series speaker	March 2018
	Lecture: “The truth about black holes”	

Astronomy on Tap public lecture series speaker and volunteer Close to a monthly basis	2016–2018
Caltech astronomy public lecture series panelist and emcee Approximately every three months	2016–2018
Invited guest lecture on black holes and gravitational waves <i>Science of Space and Time</i> , Hampshire College	November 2017
Invited video Q&A session, public high school physics class <i>The Nova Project</i> school, Seattle	June 2017
Guest on <i>The Titanium Physicists Podcast</i> Episode 64: The edges of Einstein Episode 62: Black Bells	April 25, 2016 February 1, 2016
Quora Q&A Session on gravitational waves and first detection 83.9k+ views, 17.5k+ followers	February 17, 2016
Invited guest host, public screening of <i>COSMOS</i> with Q&A, Science Cabaret/Cornell	March/June 2014
Invited public talk at <i>Frontiers of Cornell Astronomy</i> , Cornell Friends of Astronomy	November 2013
Invited video chat, <i>Topics in Physics</i> course, Stanford Education Program for Gifted Youth	July 2013

COMPUTER SKILLS **Languages**—Expert in MATHEMATICA. Proficient in C/C++. Experience in Python, Javascript, Java, Bash, Haskell; LaTeX, HTML, CSS.

Operating systems—Mac OS, Linux/*nix.

Software—Most contributions can be found at <https://github.com/duetosymmetry>. Member of the *Simulating eXtreme Spacetimes* (SXS) collaboration, contributor to the Spectral Einstein Code (SpEC). Core collaborator on xACT (<http://xact.es/>) abstract tensor calculus package for MATHEMATICA. Coauthor of xTERIOR package for exterior differential geometry under xACT. Co-maintainer of community contributions at <http://contrib.xact.es/>. Developed [arXiv-keys](#) browser extension/add-on for Chrome/Firefox.

PUBLICATIONS IN PROGRESS	33. McNees, R. Stein, L. C. , (2018) <i>Cosmological perturbations in dynamical Chern-Simons</i> .
SUBMITTED PUBLICATIONS	32. Isi, M., Stein, L. C. (2018) <i>Measuring stochastic gravitational-wave energy beyond general relativity</i> , [arXiv:1807.02123]. 31. Barack, L., <i>et al.</i> (2018) <i>Black holes, gravitational waves and fundamental physics: a roadmap</i> , [arXiv:1806.05195].
COLLABORATION PUBLICATIONS	From 2008–2012, I was coauthor on 34 refereed LIGO and/or LIGO/Virgo collaboration publications. The short author-list publications appear below.
REFEREED PUBLICATIONS	30. Prabhu, K., Stein, L. C. (2018) <i>Black hole scalar charge from a topological horizon integral in Einstein-dilaton-Gauss-Bonnet gravity</i> , <i>Phys. Rev. D</i> 98 , 021503(R) (Rapid Communication) [arXiv:1805.02668]. 29. Gerosa, D., Hébert, F., Stein, L. C. (2018) <i>Black-hole kicks from numerical-relativity surrogate models</i> , <i>Phys. Rev. D</i> 97 , 104049 [arXiv:1802.04276]. 28. Chen, B., Stein, L. C. (2018) <i>Deformation of extremal black holes from stringy interactions</i> , <i>Phys. Rev. D</i> 97 , 084012 [arXiv:1802.02159]. 27. Chen, B., Stein, L. C. (2017) <i>Separating metric perturbations in near-horizon extremal Kerr</i> , <i>Phys. Rev. D</i> 96 , 064017 [arXiv:1707.05319]. 26. Okounkova, M., Stein, L. C. , Scheel, M. A., Hemberger, D. A. (2017) <i>Numerical binary black hole mergers in dynamical Chern-Simons: I. Scalar field</i> , <i>Phys. Rev. D</i> 96 , 044020 [arXiv:1705.07924]. 25. Tso, R., Isi, M., Chen, Y., Stein, L. C. (2017) <i>Modeling the Dispersion and Polarization Content of Gravitational Waves for Tests of General Relativity, CPT and Lorentz Symmetry</i> : pp. 205–208 [arXiv:1608.01284]. 24. McNees, R., Stein, L. C. , Yunes, N. (2016) <i>Extremal Black Holes in Dynamical Chern-Simons Gravity</i> , <i>Class. Quantum Grav.</i> 33 235013 [arXiv:1512.05453]. 23. Flanagan, É. É., Nichols, D. A., Stein, L. C. , Vines, J. (2016) <i>Prescriptions for Measuring and Transporting Local Angular Momenta in General Relativity</i> , <i>Phys. Rev. D</i> 93 , 104007 [arXiv:1602.01847]. 22. Yagi, K., Stein, L. C. (2016) <i>Black Hole Based Tests of General Relativity</i> , <i>Class. Quantum Grav.</i> 33 054001 [arXiv:1602.02413]. 21. Yagi, K., Stein, L. C. , Yunes, N. (2016) <i>Challenging the Presence of Scalar Charge and Dipolar Radiation in Binary Pulsars</i> , <i>Phys. Rev. D</i> 93 024010 [arXiv:1510.02152]. 20. Berti, E., (5 authors), Stein, L. C. , (46 more authors) (2015) <i>Testing General Relativity with Present and Future Astrophysical Observations</i> , <i>Class. Quantum Grav.</i> 32 243001 [arXiv:1501.07274]. 19. Tsang, D., Galley, C. R., Stein, L. C. , Turner, A. (2015) “ <i>Slimplectic</i> ” Integrators: Variational Integrators for General Nonconservative Systems, <i>ApJ</i> 809 L9 [arXiv:1506.08443]. 18. Yagi, K., Stein, L. C. , Pappas, G., Yunes, N., Apostolatos, T. (2014) <i>Why I-Love-Q: Explaining why universality emerges in compact objects</i> , <i>Phys. Rev. D</i> 90 063010 [arXiv:1406.7587]. 17. Stein, L. C. (2014) <i>Rapidly rotating black holes in dynamical Chern-Simons gravity: Decoupling limit solutions and breakdown</i> , <i>Phys. Rev. D</i> 90 044061 [arXiv:1407.2350]. 16. Stein, L. C. , Yagi, K., Yunes, N. (2014) <i>Three-Hair Newtonian Relations for Rotating Stars</i> , <i>ApJ</i> 788 15 [arXiv:1312.4532]. 15. Stein, L. C. , Yagi, K. (2013) <i>Parameterizing and constraining scalar corrections to general relativity</i> , <i>Phys. Rev. D</i> 89 044026 [arXiv:1310.6743]. 14. Yagi, K., Stein, L. C. , Yunes, N., Tanaka, T. (2013) <i>Isolated and Binary Neutron Stars in Dynamical Chern-Simons Gravity</i> , <i>Phys. Rev. D</i> 87 084058 [arXiv:1302.1918].

13. Yagi, K., **Stein, L. C.**, Yunes, N., Tanaka, T. (2012), *Post-Newtonian, Quasi-Circular Binary Inspirals in Quadratic Modified Gravity*, *Phys. Rev. D* **85** 064022 [[arXiv:1110.5950](#)]
12. Vigeland, S., Yunes, N., **Stein, L. C.** (2011), *Bumpy black holes in alternative theories of gravity*, *Phys. Rev. D* **83** 104027 [[arXiv:1102.3706](#)]
11. Yunes, N., **Stein, L. C.** (2011), *Nonspinning black holes in alternative theories of gravity*, *Phys. Rev. D* **83** 104002 [[arXiv:1101.2921](#)]
10. **Stein, L. C.**, Yunes, N. (2011), *Effective gravitational wave stress-energy tensor in alternative theories of gravity*, *Phys. Rev. D* **83** 064038 [[arXiv:1012.3144](#)]
9. Lutomirski, A., Tegmark, M., Sanchez, N. J., **Stein, L. C.**, Urry, W. L., Zaldarriaga, M. (2011), *Solving the corner-turning problem for large interferometers*, *MNRAS* **410** 2075 [[arXiv:0910.1351](#)]
8. Sutton, P., Jones, G., Chatterji, S., Kalmus, P., Leonor, I., Poprocki, S., Rollins, J., Searle, A., **Stein, L.**, Tinto, M., Was, M. (2010), *X-Pipeline: an analysis package for autonomous gravitational-wave burst searches*, *New J. Phys.* **12** 053034 [[arXiv:0908.3665](#)]
7. Chatterji, S., Lazzarini, A., **Stein, L.**, Sutton, P., Searle, A. (2006), *Coherent network analysis technique for discriminating gravitational-wave bursts from instrumental noise*, *Phys. Rev. D* **74** 082005 [[arXiv:gr-qc/0605002](#)]
6. Galley, C. R., Tsang, D., **Stein, L. C.** (2014) *The principle of stationary nonconservative action for classical mechanics and field theories*, [[arXiv:1412.3082](#)]
5. **Stein, L. C.** (2014), *Note on Legendre decomposition of the Pontryagin density in Kerr*, [[arXiv:1407.0744](#)]
4. **Stein, L. C.** (2012), *Probes of Strong-field Gravity*, Ph.D. thesis at Massachusetts Institute of Technology [[hdl:1721.1/77256](#)]
3. Betancourt, M., **Stein, L. C.** (2011) *The Geometry of Hamiltonian Monte Carlo*, [[arXiv:1112.4118](#)]
2. **Stein, L. C.** (2009), *Binary Inspirational Gravitational Waves from a Post-Newtonian Expansion*, Contribution to the Wolfram Demonstrations Project, <http://demonstrations.wolfram.com/BinaryInspirationalGravitationalWavesFromAPostNewtonianExpansion/>
1. **Stein, L. C.** (2006), *Gravitational Wave Burst Source Localization in a Coherent Network Analysis*, Senior thesis at California Institute of Technology

UNREFEREED
PUBLICATIONS

INVITED TALKS

- | | |
|---|---------------------|
| 30. ETH-ITS Zurich, “New horizons for gravity” workshop | May 2018 |
| 29. UC San Diego, astrophysics seminar | March 2018 |
| 28. UC Berkeley, 4D particle physics seminar | March 2018 |
| 27. Kyoto University, YKIS2018a Symposium | February 2018 |
| 26. Oakland University physics seminar | February 2018 |
| 25. University of Wisconsin-Milwaukee gravity seminar | January 2018 |
| 24. Caltech/JPL Gravitational-Wave (CaJAGWR) seminar | January 2018 |
| 23. ICN UNAM, Relativity seminar | December 2017 |
| 22. University of Mississippi, Astrophysics seminar | November 2017 |
| 21. University of Florida, Astrophysics seminar | November 2017 |
| 20. University of Nottingham, Mathematical Physics seminar | July 2017 |
| 19. Sapienza University of Rome, New Frontiers in Gravitational-Wave Astrophysics | June 2017 |
| 18. Rochester Institute of Technology, CCRG seminar | March 2017 |
| 17. Penn State, IGC seminar | March 2017 |
| 16. University of Mississippi, Strong Gravity/Binary Dynamics workshop | February/March 2017 |
| 15. SUNY Stony Brook, “The universe through gravitational waves” | December 2016 |

14. University of Pennsylvania, New Frontiers in Gravitational Radiation workshop December 2016
13. Cambridge MA, Event Horizon Telescope collaboration meeting November/December 2016
12. Northwestern University CIERA, “Fellows at the Frontiers” August/September 2016
11. Princeton University, GR@100++ panel discussion April 2016
10. Cambridge MA, Einstein fellows symposium October 2014
9. Perimeter Institute, Strong gravity seminar October 2014
8. Cornell University, Friends of astronomy outreach event November 2013
7. Cambridge MA, Einstein fellows symposium October 2013
6. SUNY Geneseo, Physics colloquium October 2013
5. University of Maryland, UMD gravity seminar October 2013
4. Yale University, YCAA seminar September 2013
3. Kyoto University, YITP long-term workshop June 2013
2. Cambridge MA, Einstein fellows symposium October 2012
1. Cornell University, Relativity lunch November 2011

CONTRIBUTED
TALKS (SELECTED)

18. American Physical Society Meeting April 2018
17. Pacific Coast Gravity Meeting March 2017
16. American Physical Society Meeting ~~April~~ January 2017
15. Testing Gravity 2017 January 2017
14. 21st International meeting on GR (GR21) July 2016
13. American Physical Society Meeting April 2016
12. Eastern Gravity Meeting May 2015
11. American Physical Society Meeting April 2015
10. NEB 16 Recent developments in gravity September 2014
9. American Physical Society Meeting April 2014
8. XXVII Texas symposium on relativistic astrophysics December 2013
7. 20th International meeting on GR (GR20) July 2013
6. Eastern Gravity Meeting June 2013
5. American Physical Society Meeting April 2013
4. Caltech TAPIR Seminar December 2011
3. Eastern Gravity Meeting June 2011
2. American Physical Society Meeting April 2011
1. American Physical Society Meeting April 2010

REFERENCES

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