

# Justin L. Ripley

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## Academic Employment

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Research Associate, DAMTP, University of Cambridge	October 2020-present
Research and Teaching Assistant, Princeton University	September 2014-July 2020

## Education

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PhD, Physics, Princeton University Advisor: Frans Pretorius	September 2014-July 2020
B.A., Physics, Columbia University Minor in Mathematics Departmental honors in Physics, <i>summa cum laude</i> , Phi Beta Kappa	September 2010-May 2014

## Awards/Grants

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Hartle award for best talk by a student, ISGRG Awarded for GR 22/Amaldi 13 conference	December 2019
Erwin H. Leiwant Scholarship, Columbia University	September 2013-May 2014
John Jay Scholar, Columbia University	September 2010-May 2014

## Computational Experience

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I have programming experience with C/C++, Fortran (77/90), Python, Mathematica. My Github account: JLRipley314, some of the computational projects I have worked on/am working on.

## Professional Activities

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Seminars Friday GR seminar, DAMTP, University of Cambridge	October 2020-present
Referee Physical Review D, Physical Review Letters	April 2020-present
Committees Climate and Inclusion Committee, Department of Physics, Princeton University	September 2019-May 2020

## Teaching

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Assistant Instructor, Princeton University	
EGR/PHY 191, An integrated introduction to engineering, math, physics	Fall 2019
PHY 103/105, General Physics I Lab	Fall 2018
PHY 304, Advanced Electromagnetism	Spring 2018
AST 203, The Universe	Spring 2017, 2018
PHY 523, General Relativity	Fall 2017

**Teaching Assistant, Columbia University**  
Math V2000, Introduction to higher mathematics

Spring 2014

## Outreach

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### Princeton Citizen Scientists

The Princeton Citizen Scientists (PCS) is a graduate student led group at Princeton University that is dedicated to science policy and outreach at the local, state, and federal level.

President	June 2018–July 2019
Co-organizer for science advocacy trip to Washington, D.C (article)	December 2018
Co-organizer for science “teach-in” event at Princeton Public Library (article)	October 2017

### Open Labs

Open Labs is a graduate student group at Princeton University that organizes “science cafes” where local high and middle school students hear talks given by graduate students about their research.

Treasurer and presenter	May 2018–February 2019
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### Interviews on “These Vibes are Too Cosmic”

These Vibes are Too Cosmic is a radio program run through Princeton University.

Interview on exotic compact objects	January 2019
Interview on antigravity	March 2016

## Invited Talks/Seminars

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|---|---------------|
| 6. University of Cambridge, Cambridge, UK (virtual)<br><i>Computing the second order gravitational perturbation of Kerr black holes</i>       | November 2020 |
| 5. Johns Hopkins University, Baltimore, MD (virtual)<br><i>Numerical computation of second order vacuum perturbations of Kerr black holes</i> | November 2020 |
| 4. Princeton University, Princeton, NJ (virtual)<br><i>Classical modifications to Einstein’s General Relativity around black holes</i>        | October 2020  |
| 3. Perimeter Institute, Waterloo, ON (virtual)<br><i>Exploring the nonlinear dynamics of Einstein dilaton Gauss-Bonnet gravity</i>            | April 2020    |
| 2. University of Illinois, Urbana-Champaign, IL<br><i>Testing General Relativity and the nonlinear dynamics of modified gravity theories</i>  | January 2020  |
| 1. Black Hole Initiative, Harvard University, Cambridge, MA<br><i>Nonlinear dynamics of Horndeski theories in spherical collapse</i>          | December 2019 |

## Seminars/Contributed Talks (selected)

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| 5. APS April Meeting, Washington, DC (virtual)<br><i>Second order perturbation of a Kerr black hole</i>                          | April 2020    |
| 4. Massachusetts Institute of Technology, Cambridge, MA<br><i>Second order vacuum perturbation of a Kerr black hole</i>          | December 2019 |
| 3. GR 22/Amaldi 13, Valencia, Spain<br><i>Nonlinear dynamics of Horndeski theories in spherical collapse</i>                     | July 2019     |
| 2. APS April Meeting, Denver, CO<br><i>Hyperbolicity in gravitational collapse in a modified gravity theory</i>                  | April 2019    |
| 1. Numerical Relativity beyond General Relativity, Benasque, Spain<br><i>Gravitational collapse in a modified gravity theory</i> | June 2018     |

## Refereed Publications

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Link to all papers, including preprints: [InSpire Hep](#)

8. **Justin L. Ripley**, Frans Pretorius *Dynamics of a  $\mathbb{Z}_2$  symmetric EdGB gravity in spherical symmetry*. Class. Quant. Grav. 37 (15), 155003. [arXiv:2005.05417](#)
7. **Justin L. Ripley**, Frans Pretorius *Scalarized black hole dynamics in Einstein-dilaton-Gauss-Bonnet gravity*. Phys. Rev. D 101 (4), 044015. [arXiv:1911.11027](#)
6. **Justin L. Ripley**, *Excision and avoiding the use of boundary conditions in numerical relativity*. Class. Quantum Grav. 36 (23) 237001. [arXiv:1908.04234](#)
5. **Justin L. Ripley**, Frans Pretorius, *Gravitational collapse in Einstein dilaton Gauss-Bonnet gravity* Class. Quantum Grav. 36 (13) 134001. [arXiv:1903.07543](#) (Invited to Focus Issue on Numerical Relativity Beyond General Relativity)
4. **Justin L. Ripley**, Frans Pretorius, *Hyperbolicity in Spherical Collapse of a Horndeski Theory*. Phys. Rev. D 99 (8), 084014. [arXiv:1902.01468](#)
3. **Justin L. Ripley**, Kent Yagi, *Black hole perturbation under a 2+2 decomposition in the action*. Phys. Rev. D 97 (2), 024009. [arXiv:1705.03068](#)
2. Anna Ijjas, **Justin L. Ripley**, Paul J. Steinhardt, *NEC violation in mimetic cosmology revisited*. Phys.Lett. B760 132-138. [arXiv:1604.08586](#)
1. **Justin L. Ripley**, Brian D. Metzger, Almudena Arcones, and Gabriel Martinez-Pinedo, *X-ray Decay Lines from Heavy Nuclei in Supernova Remnants as a Probe of the r-Process Origin and the Birth Periods of Magnetars*. Mon. Not. Roy. Astron. Soc. 438 (4), 3243-3254. [arXiv:1310.2950](#)