Justin L. Ripley

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Academic Employment

Research Associate, DAMTP, University of Cambridge **October 2020-present**

Research and Teaching Assistant, Princeton University **September 2014-July 2020**

Education

PhD, Physics, Princeton University **September 2014-July 2020**

Advisor: Frans Pretorius

B.A., Physics, Columbia University **September 2010-May 2014**

Minor in Mathematics

Departmental honors in Physics, *summa cum laude*, Phi Beta Kappa

Awards/Grants

Hartle award for best talk by a student, ISGRG (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**

Professional Activities

Seminar Friday GR seminar, DAMTP, University of Cambridge **October 2020-present**

Referee Physical Review D, Physical Review Letters **April 2020-present**

Committee Climate and Inclusion, Department of Physics, Princeton University **September 2019-May 2020**

Computational Experience

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

Teaching

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**
AST 204, Topics in Modern Astronomy	**Spring 2016**
PHY 301, Thermal Physics	**Fall 2015, Spring 2016**

Teaching Assistant, Columbia University

Math V2000, Introduction to higher mathematics	**Spring 2014**

Outreach

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**

Department of Physics, Princeton University

I participated in several science outreach events organized through the Department of Physics at Princeton University throughout my time as a graduate student. Events where I helped plan/organize some of programming are listed below.

Trenton science summer camp (helped plan and run several lessons over 2 weeks) **July 2018**

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

7. University of Southampton, Southampton, UK (virtual) **January 2021**
   The classical evolution of binary black hole systems in scalar-tensor theories
6. University of Cambridge, Cambridge, UK (virtual) **November 2020**
   Computing the second order gravitational perturbation of Kerr black holes
5. Johns Hopkins University, Baltimore, MD (virtual) **November 2020**
   Numerical computation of second order vacuum perturbations of Kerr black holes
4. Princeton University, Princeton, NJ (virtual) **October 2020**
   Classical modifications to Einstein's General Relativity around black holes
3. Perimeter Institute, Waterloo, ON (virtual) **April 2020**
   Exploring the nonlinear dynamics of Einstein dilaton Gauss-Bonnet gravity
2. University of Illinois, Urbana-Champaign, IL **January 2020**
   Testing General Relativity and the nonlinear dynamics of modified gravity theories
1. Black Hole Initiative, Harvard University, Cambridge, MA **December 2019**
   Nonlinear dynamics of Horndeski theories in spherical collapse

Contributed Talks/Seminars (selected)

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

Refereed Publications

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 Martnez-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