

# ROMAN BERENS

roman.berens@vanderbilt.edu

## EMPLOYMENT

---

Vanderbilt University Department of Physics *September 2023 – Present*  
*Postdoctoral Research Scholar in the Initiative for Gravity, Waves, and Fluids*

## EDUCATION

---

Columbia University *August 2016 – December 2022*  
*Doctor of Philosophy candidate, High Energy Theoretical Physics*

Advisor: Prof. Rachel Rosen

Thesis: *Perspectives on Black Holes: Astrophysical, Geometric, and Beyond General Relativity*

Harvard University *August 2012 – May 2016*

*Master of Arts, Physics*

*Bachelor of Arts, cum laude in Physics and Classics*

## PUBLICATIONS

---

- P. Galison, M. Johnson, A. Lupsasca, T. Gravely, R. Berens, “The Black Hole Explorer: Using the Photon Ring to Visualize Spacetime Around the Black Hole,” *Proceedings Volume 13092, Space Telescopes and Instrumentation 2024: Optical, Infrared, and Millimeter Wave; 130926R* (2024) [arXiv:2406.11671].
- R. Berens, T. Gravely, and A. Lupsasca, “Gravitational Waves on Kerr Black Holes I: Reconstruction of Linearized Metric Perturbations,” *Class. Quant. Grav.* 41 (2024) 19, 195004 [arXiv:2403.20311].
- R. Berens, L. Hui, and Z. Sun, “Ladder Symmetries of Black Holes and de Sitter Space: Love Numbers and Quasinormal Modes,” *JCAP* 06 (2023) 056 [arxiv:2212.09367].
- P. Adari, R. Berens and J. Levin, “Charging up Boosted Black Holes,” *Phys. Rev. D* 107 (2023) 044055 [arXiv:2111.15027].
- R. Berens, L. Krauth and R.A. Rosen, “Gravitational Collapse in Massive Gravity on de Sitter Spacetime,” *Phys. Rev. D* 105 (2022) 064057 [arXiv:2109.10411].

## CONFERENCES/WORKSHOPS ATTENDED

---

American Physical Society April Meeting *4/2 – 4/6/2024*  
*Sacramento Convention Center*

Black Hole Explorer Photon Ring Workshop *2/12 – 2/16/2024*  
*Vanderbilt University*

Probing Effective Theories of Gravity in Strong Fields and Cosmology *8/17 – 9/4/2020*  
*Kavli Institute for Theoretical Physics at University of California, Santa Barbara*

East Coast High Energy Theory Student Meeting *5/17/2019*  
*New York University*

Many Body Quantum Dynamics: Perspectives From Field Theory and Gravity *5/9/2019*  
*Initiative for Theoretical Science at The City University of New York*

## TALKS GIVEN

---

APS April Meeting: “Metric Reconstruction on Kerr Black Holes” *4/5/2024*

Princeton Gravity Initiative Seminar: “Metric Reconstruction on Kerr Black Holes” *4/1/2024*

VandyGRAF Seminar: “Metric Reconstruction on Kerr Black Holes”	3/22/2024
High Energy Theory Group Meeting: “Building to dRGT Massive Gravity”	10/19/2021
High Energy Theory Group Meeting: “Gravitational Collapse in Massive Gravity”	10/5/2021
Theoretical Astrophysics Group Meeting: “Charge Accretion on a Boosted Black Hole”	6/10/2021
High Energy Theory Group Meeting: “The Mathematics of Juggling”	3/18/2021
High Energy Theory Group Meeting: “An Introduction to Knot Theory”	3/7/2019
Physics 8012 (Astrophysics II) Seminar: “Signals of Scalar-Tensor Theories”	3/19/2018
High Energy Theory Group Meeting: “An Introduction to Massive Gravity”	2/15/2018

## TEACHING EXPERIENCE

---

Columbia Science Fellow in the Frontiers of Science Program	January 2023 – May 2023
Columbia University Teaching Assistant	August 2016 – December 2022
· General Physics I Lab (1291)	Fall 2016
· General Physics II Lab (1292)	Spring 2017, Summer 2017, Summer 2018
· General Physics I (1201)	Fall 2018
· General Physics II (1202)	Summer 2017, Spring 2019*, Summer 2020, Summer 2021, Spring 2022
· Intro to Experimental Physics Lab (1494)	Fall 2017, Spring 2018
· Physics I: Mechanics and Relativity (1601)	Fall 2019
· Physics II: Thermodynamics and Electromagnetism (1602)	Spring 2020
· Physics for Poets (1001)	Spring 2017*
· Basic Physics (S0065)	Summer 2018, 2019, 2021
· Intro to Mechanics and Thermodynamics (1401)	Fall 2018
· Intro to Electromagnetism and Optics (1402)	Summer 2017, Spring 2019*, Spring 2022
· Mathematical Methods (4019)	Fall 2017*, Fall 2019*
· Advanced Electromagnetism (3007)	Fall 2018*
· Advanced Mechanics (3003)	Spring 2018*, 2019*, 2020*, 2021*, 2022
· Quantum Mechanics (4021)	Fall 2022
· Intro to General Relativity (4040)	Fall 2020
· Physics Help Room	Fall 2016, Summer 2017, Spring 2017, Spring 2018*
*indicates additional voluntary teaching	
Allan M. Sachs Teaching Award for outstanding graduate student instruction	2019

## SERVICE/OUTREACH

---

Columbia Physics Graduate Council (Founding Member)	January 2017 – May 2020
President	March 2019 – May 2020
Reading Team Math Program (after-school math instruction in Harlem)	March 2018 – December 2022
Team Leader	September 2019 – December 2022
Columbia Undergraduate Society of Physics Students Seminar	4/2/2020
Democracy Prep Outreach (presentation to students at local high school)	11/16/2020
“Singularities, Schwarzschild Radii, and Spaghettification: The Extreme Physics of Black Holes”	
Vanderbilt QuarkNet Workshop	6/17/2024
“Singularities, Schwarzschild Radii, and Spaghettification: The Extreme Physics of Black Holes”	

## TECHNICAL SKILLS

---

- Advanced proficiency with *LaTeX* and *Mathematica*, including the *xAct* suite of packages.
- Basic knowledge of C++ and Python.