

# Richard J. Anantua

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## Education

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### Stanford University

Stanford, CA

PH.D. IN PHYSICS

Jun. 2011 - Sep. 2016

- Thesis: "Towards Multi-Wavelength Observations of Relativistic Jets from General Relativistic Magnetohydrodynamic Simulations"
- Adviser: Roger Blandford

### Harvard University

Cambridge, MA

M.ED. IN EDUCATION POLICY AND MANAGEMENT

Sep. 2013 - May 2014

- Also completed courses at Harvard Business School and Harvard-Smithsonian Center for Astrophysics

### Stanford University

Stanford, CA

M.S. IN PHYSICS

Jun. 2011 - Jan. 2013

### Yale University

New Haven, CT

B.S. IN (PHYSICS AND PHILOSOPHY) AND (ECONOMICS AND MATHEMATICS)

Sep. 2006 - May. 2010

- Distinction in (Physics and Philosophy)

## Experience

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### Center for Astrophysics | Harvard & Smithsonian

Cambridge, Massachusetts

POSTDOCTORAL FELLOW - INSTITUTE FOR THEORY AND COMPUTATION AND BLACK HOLE INITIATIVE

Jan. 2019 - Exp. Jan. 2022

- In Prof. Ramesh Narayan Group, devised near-horizon emission modeling computational pipeline for Observing Jet (or Outflow)/Accretion Flow/Black Hole (JAB) Simulations, e.g., of Sgr A\*

### UC Berkeley Department of Astronomy

Berkeley, California

POSTDOCTORAL FELLOW - THEORETICAL ASTROPHYSICS CENTER

Nov. 2016 - Jan. 2019

- In Prof. Eliot Quataert Group, generalized the radiative transfer routine for Observing Jet Simulations in my doctoral thesis to simultaneously include polarization and opacity to image general relativistic magnetohydrodynamic (GRMHD) simulations
- Mentored undergraduate student Jeremy Wayland, including Summer Undergrad Research Fellowship (SURF) 2018

INSTRUCTOR

Jul. 2017 - Aug. 2017

Jul. 2018 - Aug. 2018

- Co-designed and co-taught Summer 2018 undergraduate course Astron 9 "Order of Magnitude Physics"  
Along with postdocs Jing Luan and Jeffrey Fung, held office hours and created and graded homework, exams and projects
- Designed and taught Summer 2017 undergraduate course Astron 9 "Relativity of Space and Time in Popular Science"  
Held office hours and created and graded all homework, exams and projects

### Kavli Institute for Particle Astrophysics and Cosmology

Stanford, CA

RESEARCH ASSOCIATE

Sep. 2012 - Aug. 2016

- Devised radiative transfer routine to post-process GRMHD simulations resulting in intensity and polarization maps for comparison with Event Horizon Telescope observations (see Thesis)

### Stanford University Department of Physics

Stanford, CA

TEACHING ASSISTANT

Sep. 2015 - Dec. 2015

Apr. 2013 - Jun. 2013

Sep. 2012 - Dec. 2012

- Served as teaching assistant for the graduate course Ph 216 Back of the Envelope Physics
- Served as teaching assistant for the undergraduate course Ph 17 Black Holes
- Served as teaching assistant for the undergraduate course Ph 45 Light and Heat

RESEARCH ASSOCIATE - STANFORD INSTITUTE FOR THEORETICAL PHYSICS

Jun. 2011 - Sep. 2012

- Used AdS/CFT to compute current-current Green's functions for the low temperature resistivity of a quantum liquid described by a superconformal strongly coupled field theory (see Publications)

## Self-Employed

PRIVATE TUTOR

*New York, NY*

*Aug. 2010 - May. 2011*

- Advertised and performed tutoring services in chemistry, physics and math for public and private middle and high school students

## Yale University

UNDERGRADUATE QUANTITATIVE REASONING TUTOR

*New Haven, CT*

*Sep. 2008 - Apr. 2011*

- Tutored for Yale undergraduates in astronomy, economics, mathematics and physics courses

## Jack Harris Lab at Yale

UNDERGRADUATE RESEARCHER

*New Haven, CT*

*May. 2009 - Aug. 2009*

- Modeled using Python code an optomechanical cavity that strongly couples the oscillation of an SiN membrane to cavity electric field modes via radiation pressure in order to lay groundwork for quantum nondemolition measurement of membrane ground state phonon number

## Honors & Awards

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|------|--|----------------------|
| 2014 | <b>Fellowship</b> , Stanford Diversifying Academia, Recruiting Excellence (DARE) (awarded to 20% of Stanford Ph.D. applicants)                   | <i>Stanford, CA</i>  |
| 2013 | <b>Award</b> , Harvard University Leadership in Education Award, awarded to top 10-15% of Harvard Graduate School of Education (HGSE) applicants | <i>Cambridge, MA</i> |
| 2013 | <b>Fellowship</b> , Achievement Rewards for College Scientists (ARCS) (I declined this to attend Harvard)  | <i>USA</i>           |
| 2009 | <b>Fellowship</b> , Yale College Dean's Research Fellowship  | <i>New Haven, CT</i> |
| 2001 | <b>Medal</b> , Prep for Prep Les Pierre Medal (awarded to 1 top male and 1 top female in cohort at the end of 14-month preparatory component)    | <i>New York, NY</i>  |

## Refereed Publications

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- R. J. Anantua, S. M. Ressler and E. Quataert, "On the Comparison of AGN with GRMHD Simulations, I. Sgr A\*," (2019) (submitted to MNRAS)
- T. K. Fowler, H. Li and R. J. Anantua, "Hyper-Resistive Model of Ultra High Energy Cosmic Ray Acceleration by Magnetically Collimated Jets Created by Active Galactic Nuclei," (2019) [ArXiv 1903.06839] (submitted to ApJ)
- R. J. Anantua, R. D. Blandford and A. Tchekhovskoy, "Multiwavelength Observations of Relativistic Jets from General Relativistic Magnetohydrodynamic Simulations," *Galaxies* **6**, 31 (2018)
- R. D. Blandford and R. J. Anantua, "The Future of Black Hole Astrophysics in the LIGO-VIRGO-LPF Era," *J. Phys.: Conf. Ser.* **840**, 012023 (2017)
- M. Ackermann et al., "Minute-Timescale >100 MeV  $\gamma$ -Ray Variability During the Giant Outburst of Quasar 3C 279 Observed by FERMI-LAT in 2015 June," *ApJ* **824**, L20 (2016)
- R. J. Anantua, S. A. Hartnoll, V. L. Martin and D. M. Ramirez, "The Pauli exclusion principle at strong coupling: Holographic matter and momentum space," *JHEP* **3**, 104 (2013)
- R. J. Anantua and O. K. Baker, "TeV gamma rays from distant BL Lacs and photon-paraphoton kinetic mixing," *Phys. Lett. B* **690**, 25-28 (2010)
- R. J. Anantua, R. Easther and J. Giblin Jr., "Grand Unification Scale Primordial Black Holes: Consequences and Constraints," *Phys. Rev. Lett.* **103**, 111303 (2009)

## Certifications

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### National Strength and Conditioning Association

*USA*

CERTIFIED PERSONAL TRAINER (7222650311)

*2011*

## Skills

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- **C/C++**, **Mathematica**, **Python**, **UNIX**
- **Haitian Creole & French**, speaking proficiency