

JARED ROBERT RICE

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Education

PhD, Astronomy – Successfully defended April 6, 2018 University of Nevada, Las Vegas

Advisor: [Bing Zhang, PhD](#) Dissertation: *Primordial black holes in the cosmological context and transient electromagnetic signatures from merging black hole binaries*

MS, Physics, 2012 Montana State University

Advisors: [Sachiko Tsuruta, PhD](#) and [Jiong Qiu, PhD](#)

BS, Astrophysics, 2008 University of California, Santa Cruz

Advisor: [Joel Primack, PhD](#)

Research interests

- Electromagnetic counterparts of binary compact object mergers
 - EM radiation mechanisms, relativistic blast waves, evolving synchrotron spectra, interaction of EM fields with gravitational waves, predicting observational EM and GW signatures of compact object mergers
- Very long baseline interferometry of supermassive black hole jet cores
 - Probing black hole environments using the frequency-dependent synchrotron radio emission, utilizing the Very Long Baseline Array for astrometry of jet cores
- Primordial black holes
 - Accretion and evaporation histories of PBHs, importance of PBHs as cosmic messengers

Publications

Metrics: Total citations: **11**, h-index: **2**, First author h-index: **1**

1. **Rice, J.R.** and Zhang, B., *Transient electromagnetic signature of supermassive black hole binary mergers*, (to be submitted to ApJ, 2018)
2. **Rice, J.R.**, Zavala, R.T., and Taylor, G.B., *Core shifts in compact symmetric objects*, (in progress, 2018)
3. Lan, L., Lü, H.-J., Zhong, S.-Q., Zhang, H.-M., **Rice, J.**, Cheng, J.-G., Du, S.-S., Li, L., Lu, R.-J., and Liang, E.-W., *Characteristics of two-episode emission patterns in Fermi long gamma-ray bursts*, (ApJ, accepted, 2018)
4. **Rice, J.R.** and Zhang, B., *Cosmological evolution of primordial black holes*, [Journal of High Energy Astrophysics](#), **13**, 22 (2017)
5. Lü, H.-J., Zhang, H.-M., Zhong, S.-Q., Hou, S.-J., Sun, H., **Rice, J.**, and Liang, E.-W., *Magnetar central engine and possible gravitational wave emission of nearby short GRB 160821B* [Astrophysical Journal](#), **835**, 181 (2017)
6. Li, L.B., Zhang, Z.B., and **Rice, J.**, *Radio afterglow rebrightening: evidence for multiple active phases in gamma-ray burst central engines*, [Astrophysics and Space Science](#), **359**, 37 (2015)

Textbook editing and illustrations

- Copyedited and produced numerous figures for Bing Zhang, *The Physics of Gamma-Ray Bursts*, Cambridge University Press (in press August 2018)
- Produced various diagrams for Thomas Banks, [Modern Quantum Field Theory: A Concise Introduction](#), Cambridge University Press (2008)

Awards

- US Naval Observatory Flagstaff Station Colloquium Honorarium (2018) \$ 250
- Nevada NASA Space Grant Consortium Graduate Research Fellowship (2016) \$ 10,500
- UNLV Foundation Bigelow Travel Grant (2014) \$ 4,000
- NSF REU Research Grant (2007) \$ 5,000
- UCSC Crown College Undergraduate Research Fellowship (2007) \$ 700
- MSU Excellent Graduate Teaching Assistant Award (2014) —

Skills

- Python and iPython
 - Developed synchrotron radiation code for blast wave afterglow calculations
 - Developed cosmology-dependent primordial black hole accretion and evaporation code
- VLBA data reduction using the Astronomical Image Processing System (*AIPS*) code.
- PhD focus: electromagnetic counterparts of gravitational wave events, relativistic blast waves, primordial black holes, and high energy astrophysical synchrotron sources.

Teaching

- Adjunct Instructor of Physics (2012/2013), Miami University, Oxford, OH
- Adjunct Instructor of Physics (2013), Miami University Hamilton, Hamilton, OH
- Graduate Teaching Assistant (2013 – 2018), UNLV
- Graduate Teaching Assistant (2009 – 2012), MSU
- Guest lecturer, Solar System Astronomy (Fall 2011), MSU

Conferences & Workshops

- [16th Synthesis Imaging Workshop](#), New Mexico Tech, Socorro, NM, May 16–23, 2018
- [LIGO Open Data Workshop # 1](#), Caltech, Pasadena, CA, March 25–27, 2018
- [IAU 338: GW Astrophysics: Early Results from GW Searches and EM Counterparts](#), 2017
 - Contributed talk: “*Radio afterglow of gravitation-driven plasma waves in SMBH binary mergers*”
- [Eighth Huntsville Gamma-Ray Burst Symposium](#), 2016
 - Poster: “*Cosmological evolution of primordial black holes*”
- UNLV/Caltech Radio Transient Workshop, Las Vegas, 2016
- UNLV Gamma-Ray Bursts and Numerical Simulations Workshop, Las Vegas, 2015
- European Week of Astronomy and Space Science; Geneva, Switzerland, 2014
- IAU 307: New Windows on Massive Stars; Geneva, Switzerland, 2014
- UCSC Galaxy Formation and Evolution Workshop; Santa Cruz, 2007
- All-Wavelength Extended Groth Strip International Survey Meeting; Santa Cruz, 2006

Outreach

- Visiting Outreach Astronomer (2017 – present) in Nipton, CA
- Astronomy Day Volunteer (2010 – 2012), Museum of the Rockies, Bozeman, MT
- Instructor, Rocket Physics (2011), *MSU Peaks & Potentials* (elementary students)

Professional references

1. Bing Zhang, PhD, Professor of Astrophysics, UNLV
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2. Robert Zavala, PhD, Astronomer, United States Naval Observatory, Flagstaff Station

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3. Darrell Pepper, PhD, Professor of Mechanical Engineering, UNLV

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