Jared Robert Rice

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Postdoctoral Research Associate, Texas State University

Education

PhD, Astronomy, 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

X-ray and optical observations of high-energy astrophysical sources:

X-ray binaries in interacting and starforming galaxies; X-ray (*Chandra*) and optical (*HST*) data analysis

Gamma-ray bursts:

Multiwavelength GRB blast wave afterglows; GRB prompt emission; NS equation of state; gravitational wave emission

Very long baseline interferometry of supermassive black hole jet cores:

Probing black hole environments using the frequency-dependent synchrotron radio emission; astrometry of jet cores with the Very Long Baseline Array

Primordial black holes:

Accretion and evaporation histories of PBHs; PBHs as cosmic messengers; feasibility of detection

Publications

Metrics: Published papers: **12**; Citations: **93**; h-index: **5**; First author h-index: **2**; i10-index: **4**
ADS entries, ADS citation metrics

1. Yang, X., Lü, H.-J., Yuan, H.-Y., **Rice, J.**, Zhang, Z., Zhang, B.-B., and Liang, E.-W., *Evidence for gravitational lensing of GRB 200716C*, The Astrophysical Journal Letters, (accepted 2021)
2. **Rice, J. R.**, Rangelov, B., Prestwich, A., Chandar, R., Bichon, L., and Boldt, C., *X-ray binaries in M51 I: catalog and statistics*, The Astrophysical Journal, (accepted 2021)
3. **Rice, J. R.** and Zhang, B., *Growth of stellar mass black holes in dense molecular clouds and GW190521*, The Astrophysical Journal, **908**, 59 (2021)
4. (In prep, 2021) **Rice, J. R.**, Rangelov, B., Prestwich, A., Chandar, R., Bichon, L., and Boldt, C., *X-ray binaries in M51 II: individual sources*
5. (In prep, 2021) **Rice, J. R.**, Rangelov, B., Chandar, R., and Prestwich, A., *Optical counterparts to X-ray sources in nearby starburst galaxies*
6. (In prep, 2021) **Rice, J. R.** and Zhang, B., *Transient electromagnetic signatures from merging supermassive black hole binaries*

7. (In prep, 2021) **Rice, J. R.**, Zavala, R.T., and Taylor, G.B., *Core shifts in compact symmetric objects*
8. Lan, L., Lü, H.-J., Shen, J., **Rice, J.**, Li, L., and Liang, E.-W., *The properties of prompt emission in short GRBs with extended emission observed by* Fermi*/GBM*, Monthly Notices of the Royal Astronomical Society, **492**, 3622 (2020)
9. Lan, L; Lü, H.-J.; **Rice, J.**; and Liang, E.-W., *Constraining the nuclear equation of state via gravitational-wave radiation of short gamma-ray burst remnants*, The Astrophysical Journal, **890**, 99 (2020)
10. Moravec, E. et al., *The early career perspective on the coming decade, astrophysics career paths, and the Decadal Survey process, APC White Papers No. 8*, Bulletin of the American Astronomical Society, **51**, 8 (2019)
11. Lü, H.-J., Shen, J.; Lan, L., **Rice, J.**, Lei, W.-H., Liang, E.-W. *Diagnosing the remnants of binary neutron star merger from GW170817/GRB170817A event*, Monthly Notices of the Royal Astronomical Society, **486**, 4479 (2019)
12. **Rice, J. R.**, *Primordial black holes in the cosmological context and transient electromagnetic signatures from merging black hole binaries*, ProQuest Dissertations and Theses (2018)
13. 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*, The Astrophysical Journal, **862**, 155 (2018)
14. **Rice, J. R.** and Zhang, B., *Cosmological evolution of primordial black holes*, Journal of High Energy Astrophysics, **13**, 22 (2017)
15. 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* The Astrophysical Journal, **835**, 181 (2017)
16. 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)

Professional duties

- Panel Leveler for the first ever Dual Anonymous Peer Review (DAPR) *Chandra* Cycle 23 Proposal Review, June 21–24, 2021, *Chandra X-ray Observatory*
- Referee, 2021 – present, Journal of Cosmology and Astroparticle Physics
- Referee, 2019 – present, Journal of High Energy Astrophysics
- Contributed opinions to the Early Career Astronomer and Astrophysicist Focus Session for the 2020 Decadal Survey, Washington, DC, October 8–9, 2018

Textbook editing and illustrations

- Copyedited and produced numerous figures for Bing Zhang, *The Physics of Gamma-Ray Bursts*, Cambridge University Press (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)	**$ 21,000**
– UNLV Foundation Bigelow Travel Grant	(2014)	**$ 4,000**
– MSU Outstanding Graduate Teaching Assistant Award	(2012)	**—**
– NSF REU Research Grant	(2007)	**$ 5,000**
– UCSC Crown College Undergraduate Research Fellowship	(2007)	**$ 700**

Skills

- General: Python/iPython, SAOImageDS9, LaTeX, IDL, HTML
- X-ray data analysis: *Chandra Interactive Analysis of Observations* (CIAO)
- Optical data analysis: *Image Reduction and Analysis Facility* (IRAF)
- Radio data reduction: *Astronomical Image Processing System* (*AIPS*)
- Gravitational wave data analysis: GWpy and PyCBC

Teaching

- Guest lecturer, Introductory Astronomy (Fall 2020), Texas State University
- Guest lecturer, Graduate Astrophysics II (Spring 2017), University of Nevada, Las Vegas
- Guest lecturer, Introductory Astronomy (Fall 2015), University of Nevada, Las Vegas
- Graduate Teaching Assistant (2013 – 2018), University of Nevada, Las Vegas
- Adjunct Instructor of Physics (2012 – 2013), Miami University, Oxford, OH
- Adjunct Instructor of Physics (2013), Miami University Hamilton, Hamilton, OH
- Graduate Teaching Assistant (2009 – 2012), Montana State University
- Guest lecturer, Solar System Astronomy (Fall 2011), Montana State University

Conferences & Workshops

- Yukawa Institute of Theoretical Physics International Molecule-type Workshop: Fast Radio Bursts: A Mystery Being Solved?, Online, February 8–19, 2021
- ALMA Community Day Event, The University of Texas at Austin, Austin, TX, April 8, 2019
- Early Career Astronomer and Astrophysicist Focus Session for the 2020 Decadal Survey, Washington, DC, October 8–9, 2018
- 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, October 24–28, 2016
  * Poster: *"Cosmological evolution of primordial black holes"*
- UNLV/Caltech Radio Transient Workshop, Las Vegas, April 11–12, 2016
- UNLV GRBs and Numerical Simulations Workshop, Las Vegas, September 9, 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, UC Santa Cruz, August 6–10, 2007
- All-Wavelength Extended Groth Strip International Survey Meeting, UC Santa Cruz, December, 2006

Outreach

- 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, Distinguished Professor of Astrophysics; University of Nevada, Las Vegas

   E-mail: zhang@physics.unlv.edu
   Phone: +1 702/895-4050
   Website: http://www.physics.unlv.edu/~bzhang/

2. Blagoy Rangelov, PhD, Assistant Professor of Astrophysics; Texas State University

   E-mail: rangelov@txstate.edu
   Phone: +1 512/245-8373
   Website: http://www.blagoyrangelov.com

3. Gregory Francis, PhD, Professor of Physics; Montana State University

   E-mail: francis@montana.edu
   Phone: +1 406/994-6625
   Website: https://physics.montana.edu/directory/faculty/1524092/gregory-francis

4. Darrell Pepper, PhD, Professor of Mechanical Engineering; University of Nevada, Las Vegas

   E-mail: darrell.pepper@unlv.edu
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   Website: https://www.unlv.edu/people/darrell-pepper

5. Robert Zavala, PhD, Astronomer; United States Naval Observatory, Flagstaff Station

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   Phone: +1 928/779-5132 (260)
   Website: https://www.usno.navy.mil/USNO