

# JARED ROBERT RICE

E-mail: [jared.r.rice@protonmail.com](mailto:jared.r.rice@protonmail.com)

Homepage: [jaredrice.space](http://jaredrice.space)

ORCID ID: [0000-0003-3887-091X](https://orcid.org/0000-0003-3887-091X)

Postdoctoral Research Associate, Texas State University

## Education

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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

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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

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**Metrics:** Published papers: 12; Citations: 100; h-index: 5; First author h-index: 2; i10-index: 4

[ADS entries](#), [ADS citation metrics](#)

1. Yuan, H.-Y., Lü, H.-J., Li, Y., Zhang, B.-B., Sun, H., **Rice, J.**, Yang, J., and Liang, E.-W., *Probing the progenitor of high-z short-duration GRB 201221D and its possible bulk acceleration in prompt emission*, *Astronomy & Astrophysics*, (2022, submitted)
2. Lü, H.-J., Yuan, H.-Y., Yi, T.-F., Wang, X.-G., Hu, Y.-D., Yuan, Y., **Rice, J.**, Wang, J.-G., Cao, J.-X., Kong, D.-F., Fernandez-García, E., Castro-Tirado, A. J., Lian, J.-S., Gan, W.-P., Wang, S.-Q., Xin, L.-P., Caballero-García, M. D., Fan, Y.-F., and Liang, E.-W., *GRB 211227A as a peculiar long gamma-ray burst from compact star merger*, *The Astrophysical Journal Letters*, (2022, submitted)
3. Huang, J.-X., Lü, H.-J., Liang, E.-W., and **Rice, J.**, *Gravitational-wave evolution of new-born magnetars with different deformed structure*, *Physical Review D* (2021, submitted)
4. 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*, **921**, L29 (2021)
5. **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*, **922**, 178 (2021)
6. **Rice, J. R.** and Zhang, B., *Growth of stellar mass black holes in dense molecular clouds and GW190521*, *The Astrophysical Journal*, **908**, 59 (2021)
7. (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*
8. (In prep, 2021) **Rice, J. R.**, Rangelov, B., Chandar, R., and Prestwich, A., *Optical counterparts to X-ray sources in nearby starburst galaxies*
9. (In prep, 2021) **Rice, J. R.** and Zhang, B., *Transient electromagnetic signatures from merging supermassive black hole binaries*
10. (In prep, 2021) **Rice, J. R.**, Zavala, R.T., and Taylor, G.B., *Core shifts in compact symmetric objects*
11. 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)

12. 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)
13. 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)
14. 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)
15. Rice, J. R., *Primordial black holes in the cosmological context and transient electromagnetic signatures from merging black hole binaries*, ProQuest Dissertations and Theses (2018)
16. 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)
17. Rice, J. R. and Zhang, B., *Cosmological evolution of primordial black holes*, *Journal of High Energy Astrophysics*, **13**, 22 (2017)
18. 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)
19. 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* \_\_\_\_\_

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|---|--------|-----------|
| – 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

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- [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

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- 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](mailto: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](mailto: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](mailto: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](mailto:darrell.pepper@unlv.edu)  
Phone: +1 702/895-1056  
Website: <https://www.unlv.edu/people/darrell-pepper>

