

# 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)

Assistant Professor, Southwestern Adventist 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: **103**; 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

---

- Copypedited 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](#), [L<sup>A</sup>T<sub>E</sub>X](#), [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)

1. Bing Zhang, PhD, Distinguished Professor of Astrophysics; University of Nevada, Las Vegas  
E-mail: [bing.zhang@unlv.edu](mailto:bing.zhang@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>