

ZACHARIAH (ZACH) B. ETIENNE

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Employment

2021– Associate Professor of Physics, University of Idaho
2021– Adjunct Associate Professor of Physics & Astronomy, West Virginia University
2019–2021 Associate Professor of Physics & Astronomy, West Virginia University
2014–2019 Assistant Professor of Mathematics, West Virginia University
2013–2014 Joint Space–Science Institute Prize Postdoctoral Fellow, NASA Goddard Space Flight Center & University of Maryland
2010–2013 NSF Astronomy & Astrophysics Postdoctoral Fellow, University of Illinois
2009–2010 Postdoctoral Research Associate, University of Illinois Numerical Relativity Group

Education

2003–2009 University of Illinois — Ph.D. Physics
Stuart L. Shapiro, Ph.D. thesis advisor
1999–2003 Indiana University — B.S. Physics, *Honors College Degree certification*
Steven Gottlieb, senior thesis advisor
1999–2003 Indiana University — B.S. Mathematics
1999–2003 Indiana University — Minor Astronomy

Grants

2021–2024 **Principal Investigator**, *Boosting Algorithmic Efficiency: Numerical Relativity in Dynamical, Curvilinear Coordinates*, NSF Gravitational Physics–Theory, **\$174,803**.
2021–2024 **Co-Principal Investigator**, *Collaborative Research: WoU-MMA: Toward Binary Neutron Star Mergers on a Moving-mesh*, NSF Windows on the Universe: The Era of Multi-Messenger Astrophysics, **\$483,465; \$226,347 to Z. Etienne**.
2021–2022 **Institutional Principal Investigator**, *COVID Augmentation on “Advancing Computational Methods to Understand the Dynamics of Ejection, Accretion, Winds and Jets in Neutron Star Mergers” award*, NASA COVID, **28,609 to Z. Etienne**.
2020–2023 **Institutional Principal Investigator**, *Collaborative Research: Measuring G with a Magneto-Gravitational Trap*, NSF Gravitational Physics–Experiment, **\$567,990; \$118,517 to Z. Etienne**.
2020–2024 **Institutional Principal Investigator**, *Collaborative Research: Frameworks: The Einstein Toolkit ecosystem: Enabling fundamental research in the era of multi-messenger astrophysics*, NSF OAC, **\$2,300,415; \$335,902 to Z. Etienne**.
2020–2022 **Senior Investigator**, *REU Site: Undergraduate Astrophysics Research in Appalachia at West Virginia University*, NSF Special Programs in Astronomy, **\$339,477**.
2019–2021 **Co-Principal Investigator**, *Improving accuracy, performance, and robustness of the Spinning, Precessing Effective One-Body–Numerical Relativity Gravitational Wave Approximant*, NSF LIGO Research Support, **\$100,000**.
2018–2021 **Institutional Principal Investigator**, *Advancing Computational Methods to Understand the Dynamics of Ejection, Accretion, Winds and Jets in Neutron Star Mergers*, NASA Theoretical and Computational Astrophysics Networks (TCAN), **\$1,590,362; \$295,231 to Z. Etienne**. **9.4% of proposals were funded**. Collaborating institutions: Rochester Institute of Tech., NASA Goddard Space Flight Center, Johns Hopkins U., and West Virginia U.
2018–2021 **Principal Investigator**, *Boosting Algorithmic Efficiency: Numerical Relativity in Dynamical, Curvilinear Coordinates*, NSF Gravitational Physics–Theory, **\$152,893**.
2017–2020 **Institutional Principal Investigator**, *Multi-messenger Source Modeling*, NASA-ISFM, **\$810,000; \$95,848 to Z. Etienne**. Collaborating institutions: NASA Goddard Space Flight Center and West Virginia U.

- 2017–2020 **Co-Principal Investigator**, *MRI: Acquisition of Thorny Flat Next Generation Cluster for High-Performance Computing in West Virginia*, NSF Major Research Instrumentation (MRI), **\$989,408**.
- 2017–2020 **Institutional Principal Investigator**, *Collaborative Research: Measuring G with a Microsphere in a Magneto-Gravitational Trap*, NSF Physics: Gravitational Experiments Solicitation, **\$509,134; \$90,757 to Z. Etienne**. Collaborating institutions: Montana State U. and West Virginia U.
- 2016–2019 **Principal Investigator**, *Speeding Up the Spinning, Precessing Effective One-Body-Numerical Relativity (SEOBNRv3) Code by $\sim 10,000x$* , NSF LIGO Research Support, **\$99,020**.
- 2015–2020 **Funded Faculty**, *Waves of the Future: Capacity Building for the Rising Tide of STEM in West Virginia*, NSF Experimental Program to Stimulate Competitive Research (EPSCoR), **\$9,668,382; \approx \$300,000 to Z. Etienne**.
- 2015–2018 **Institutional Principal Investigator**, *Prompt Electromagnetic Signatures of Merging Black Holes*, NASA-Astrophysics Science Division 13-ATP13-0077, **\$439,788; \$87,932 to Z. Etienne**. **12.7% of proposals were funded**. Collaborating institutions: NASA Goddard Space Flight Center and West Virginia U.
- 2010–2013 **Principal Investigator**, *General Relativistic, Radiative Magnetohydrodynamic Simulations of Compact Binary Mergers*, NSF AST-1002667, **\$249,000**.

Awards, Honors, & Fellowships

- 2017 Research highlighted as cover story in Fall 2017 *Neuron* Magazine (West Virginia Science & Research, a division of the West Virginia Higher Education Policy Commission)
- 2016 Presidential Award for Excellence in Collaborative Research (West Virginia University)
- 2013–2014 Joint Space–Science Institute Prize Postdoctoral Fellow (NASA Goddard Space Flight Center and University of Maryland)
- 2010–2013 NSF Astronomy & Astrophysics Postdoctoral Fellowship
- 2007, 2009 APS April Meeting Travel Grant Awards, Topical Group on Gravitation
- 2003–2004 University of Illinois at Urbana-Champaign Distinguished Graduate Fellowship
- 2003– Sigma Pi Sigma (the physics honor society)
- 2003 Indiana University Honors College Grant for Senior Undergraduate Thesis
- 2003 Indiana University Graduate School Grant for Senior Undergraduate Thesis
- 1999–2003 Indiana University Faculty Scholarship
- 1999–2003 Indiana University Honors College Scholarship
- 2001, 2002 REU Student, University of Michigan
- 1999–2000 General Electric STAR Award

Major Collaborations

- 2018– Member of the Maintainers Group of the Einstein Toolkit
- 2015– LIGO Scientific Collaboration, Senior Member
- 2021– WVU Center for Gravitational Waves and Cosmology Affiliate Faculty Member
- 2016–2021 WVU Center for Gravitational Waves and Cosmology Faculty Member
- 2010–2013 Numerical Relativity & Analytical Relativity (NRAR), University of Illinois *liason*
- 2010–2014 Numerical INJection Analysis 2 (NINJA-2), University of Illinois *liason*
- 2008–2009 Numerical INJection Analysis (NINJA), University of Illinois *liason*

Teaching Assignments

- Spring 2021 PHYS 212, *Oscillations and Thermal Physics*, **3 hours lecture/week**.
- Fall 2020 PHYS 112, *General Physics 2*, **3 hours lecture/week**.
- Spring 2020 PHYS 212, *Oscillations and Thermal Physics*, **3 hours lecture/week**.
- Spring 2019 MATH 522, *Numerical Solutions of Partial Differential Equations*, **3 hours lecture/week**.
- Fall 2018 MATH 521, *Numerical Analysis*, **3 hours lecture/week**.
- Spring 2018 MATH 522, *Numerical Solutions of Partial Differential Equations*, **3 hours lecture/week**.
- Fall 2017 MATH 521, *Numerical Analysis*, **3 hours lecture/week**.
- Spring 2017 MATH 261, *Elementary Differential Equations*, **4 hours lecture/week**.
- MATH 522, *Numerical Solutions of Partial Differential Equations*, **3 hours lecture/week**.
- Fall 2016 MATH 521, *Numerical Analysis*, **3 hours lecture/week**.

- Spring 2016 MATH 156, *Calculus 2*, **4 hours lecture/week**.
MATH 522, *Numerical Solutions of Partial Differential Equations*, **3 hours lecture/week**.
Fall 2015 MATH 521, *Numerical Analysis*, **3 hours lecture/week**.
Spring 2015 MATH 522, *Numerical Solutions of Partial Differential Equations*, **3 hours lecture/week**.
Fall 2014 MATH 261, *Elementary Differential Equations*, **4 hours lecture/week**.

Mentoring

- 2021 Advisor to one postdoctoral researcher; Graduate advisor to four Ph.D. students (primary advisor to three; co-advisor to two), one postbaccalaureate researcher, and one undergraduate researcher.
- 2020 Advisor to one postdoctoral researcher; Graduate advisor to six Ph.D. students (primary advisor to four; co-advisor to two) and one Master's student
- 2019 Graduate advisor to six Ph.D. students and one Master's student; Capstone advisor to two students (undergraduate senior thesis project).
- 2018 Advisor to one postdoctoral researcher; graduate advisor to four Ph.D. students and two Master's students; Capstone advisor to three students (undergraduate senior thesis project).
- 2017 Advisor to one postdoctoral researcher; graduate advisor to five students (one M.S., four Ph.D.); Capstone advisor to two students (undergraduate senior thesis project).
- 2016 Advisor to one postdoctoral researcher; graduate advisor to five students (one M.S., four Ph.D.); Capstone advisor to two students (undergraduate senior thesis project).
- 2015 Advisor to one postdoctoral researcher; graduate advisor to three students (two M.S.); Capstone advisor to three students (undergraduate senior thesis project).
- 2014 Graduate advisor to two students (one M.S., and one Ph.D.); Capstone advisor to one student (undergraduate senior thesis project).
- 2008–2013 Mentor to six undergraduate students who generate stunning, freely-available visualizations of my simulation data. See, e.g., <http://tinyurl.com/mentormovies>.
- 2004–2013 Annual guest lecturer to five underserved high schools in southern Indiana, introducing students to Einstein's theories of relativity and science as a career. With no major research institutions nearby, most students had never interacted or communicated with a professional scientist before attending these lectures.
- 2008–2012 Mentor to two graduate students, helping them to understand, use, and extend the Illinois Numerical Relativity code to do new science. See, e.g., Farris *et al.* Phys. Rev. D, 84, 024024/1-21 (2011) and **Pub. 115** in the below **Publications** section.

Service

- 2021– U. of Idaho Observatory Committee Member
- 2021– U. of Idaho College of Science Data Science Competition Organizing Committee Member
- 2021– U. of Idaho Research Computing Steering Committee Member
- 2020–2021 Chair, WVU Physics & Astronomy Visibility Committee
- 2019–2021 WVU Physics & Astronomy Faculty Evaluation Committee Member
- 2019–2020 WVU Physics & Astronomy Faculty Search Committee Member
- 2019–2020 Chair, WVU Physics & Astronomy Website Committee
- 2018 Chair, WVU Mathematics Course Equivalence & Teaching Reassignment Policy Committee
- 2018–2019 WVU Mathematics Visibility Committee Member
- 2017–2018 WVU Mathematics Department Strategic Planning Committee Member
- 2017–2019 WVU Mathematics Department Research Committee Member
- 2016–2018 WVU Mathematics Department Assessment Committee Member
- 2016–2017 Co-Organizer, *Celebrating Einstein* Event
- 2017 WVU PSCoR grant proposal reviewer
- 2017 Keynote Address Speaker for West Virginia Health Science and Technology Academy Summer Camp students
- 2016, 2017 “Cool Talk” guest lecture for West Virginia Health Science and Technology Academy
- 2015–2021 WVU HPC (High Performance Computing) Faculty Steering Committee
- 2015– NSF grant proposal review panelist
- 2015– NASA grant proposal review panelist
- 2015–2020 West Virginia Children's Discovery Museum volunteer
- 2014– Referee for *Physical Review D*, *Physical Review Letters*, *Classical and Quantum Gravity*, and *Journal of Computational Physics*.
- 2015 Public lecture at the Chinese Mid-Autumn Research Symposium

Research Experience

- Compact binary inspirals & mergers: Simulations in fully dynamical spacetimes
 - Black hole–neutron star (Past work: **Pubs. 112, 113, 117, 118, 121, 126, & 128** in below **Publications** section.)
 - White dwarf–neutron star (**Pubs. 119 & 120**); planned follow-up: pulsar planet formation scenarios.
 - Black hole–black hole (**Pubs. 2 3, 35, 77, 107, 109, 110, 111, 115, 116, 118, 121, 123, 124, & 129**).
 - Neutron star–neutron star (**Pubs. 114 & 127**).
- Black hole accretion and electromagnetic counterparts to gravitational wave signals (**Pubs. 36, 77, 106, 108, 113, 115, 117, 118, 121, 126, 128, & 130**)
- New techniques and algorithms for compact object and compact binary simulations (**Pubs. 1, 23, 24, 38, 64, 65, 76, 103, 107, 118, 121, 122, 125, 129, 130, & 131**)
- Gravitational wave astrophysics & data analysis (Short-author list papers: **Pubs. 37, 66, & 102**; LIGO Collaboration papers: **5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 67, 68, 69, 70, 71, 72, 73, 74, 75, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 104, & 105**)
- Experimental gravity (**Pubs. 4 & 22**)

Publications

Prefix denotes number of citations (*: 1–5, **: 6–13, ***: 14–49, ****: 50–119, *****: 120+)

- Refereed Articles in Professional Journals:

2021 Short-Author-List Papers

1. L. R. Werneck, **Z. B. Etienne**, E. Abdalla, B. Cuadros-Melgar, C. E. Pellicer, *NRPycritCol & SFcollapse1D: an open-source, user-friendly toolkit to study critical phenomena*. *Class. Quant. Grav.* 38, 24, 245005 (2021).
2. S. Habib, A. Ramos-Buades, E. A. Huerta, S. Husa, R. Haas, **Z. B. Etienne**, *Initial Data and Eccentricity Reduction Toolkit for Binary Black Hole Numerical Relativity Waveforms*. *Class. Quant. Grav.* 38 125007 (2021).
3. *B. J. Kelly, **Z. B. Etienne**, J. Golomb, J. D. Schnittman, J. G. Baker, S. C. Noble, G. Ryan, *Electromagnetic Emission from a Binary Black Hole Merger Remnant in Plasma: Field Alignment and Plasma Temperature*. *Phys. Rev. D* 103, 063039 (2021).
4. **C. W. Lewandowski, T. D. Knowles, **Z. B. Etienne**, B. D’Urso, *High sensitivity accelerometry with a feedback-cooled magnetically levitated microsphere*. *Phys. Rev. Applied* 15, 014050 (2021).

2021 LIGO Scientific Collaboration Papers (on which Z. B. Etienne appears as co-author)

5. *The KAGRA, Virgo, and LIGO Scientific Collaborations, **Z. B. Etienne** coauthor. *All-sky search for long-duration gravitational-wave bursts in the third Advanced LIGO and Advanced Virgo run*. *Phys. Rev. D* 104, 10, 102001 (2021).
6. **The KAGRA, Virgo, and LIGO Scientific Collaborations, **Z. B. Etienne** coauthor. *All-sky search for continuous gravitational waves from isolated neutron stars in the early O3 LIGO data*. *Phys. Rev. D* 104, 8, 082004 (2021).
7. ***The KAGRA, Virgo, and LIGO Scientific Collaborations, **Z. B. Etienne** coauthor. *All-sky search for continuous gravitational waves from isolated neutron stars in the early O3 LIGO data*. *Phys. Rev. D* 104, 8, 082004 (2021).
8. **The LIGO Scientific, Virgo, and KAGRA Collaborations, **Z. B. Etienne** coauthor. *Searches for Continuous Gravitational Waves from Young Supernova Remnants in the Early Third Observing Run of Advanced LIGO and Virgo*. *ApJ* 921, 1, 80 (2021).
9. ***The LIGO Scientific and Virgo Collaborations, **Z. B. Etienne** coauthor. *Search for Lensing Signatures in the Gravitational-Wave Observations from the First Half of LIGOVirgos Third Observing Run*. *ApJ* 923, 1, 14 (2021).

10. **The LIGO Scientific, Virgo, and KAGRA Collaborations, **Z. B. Etienne** coauthor. *Constraints from LIGO O3 Data on Gravitational-wave Emission Due to R-modes in the Glitching Pulsar PSR J0537-6910*. ApJ 922, 1, 71 (2021).
11. ***The LIGO Scientific and Virgo Collaborations, **Z. B. Etienne** coauthor. *Search for Gravitational Waves Associated with Gamma-Ray Bursts Detected by Fermi and Swift During the LIGO-Virgo Run O3a*. ApJ 915, 2, 86 (2021).
12. *****The LIGO Scientific, KAGRA, and Virgo Collaborations, **Z. B. Etienne** coauthor. *Observation of Gravitational Waves from Two Neutron Star-Black Hole Coalescences*. ApJL 915, L5 (2021).
13. ***KAGRA, LIGO Scientific, and Virgo Collaborations, **Z. B. Etienne** coauthor. *Search for anisotropic gravitational-wave backgrounds using data from Advanced LIGO and Advanced Virgo's first three observing runs*. Phys. Rev. D 104, 022005 (2021).
14. ***The LIGO Scientific, Virgo, and KAGRA Collaborations, **Z. B. Etienne** coauthor. *Constraints on Cosmic Strings Using Data from the Third Advanced LIGO-Virgo Observing Run*. Phys. Rev. Lett. 126, 241102 (2021).
15. *****KAGRA, LIGO Scientific and Virgo Collaborations, **Z. B. Etienne** coauthor. *Upper limits on the isotropic gravitational-wave background from Advanced LIGO and Advanced Virgo's third observing run*. Phys. Rev. D 104, 022004 (2021).
16. **The LIGO Scientific, Virgo, and KAGRA Collaborations, **Z. B. Etienne** coauthor. *Diving below the spin-down limit: Constraints on gravitational waves from the energetic young pulsar PSR J0537-6910*. ApJ 913, L27 (2021).
17. *****The LIGO Scientific and Virgo Collaborations, **Z. B. Etienne** coauthor. *GWTC-2: Compact Binary Coalescences Observed by LIGO and Virgo During the First Half of the Third Observing Run*. Phys. Rev. X 11, 021053 (2021).
18. *****The LIGO Scientific and Virgo Collaborations, **Z. B. Etienne** coauthor. *Tests of general relativity with binary black holes from the second LIGO-Virgo gravitational-wave transient catalog*. Phys. Rev. D 103, 122002 (2021).
19. *****The LIGO Scientific and Virgo Collaborations, **Z. B. Etienne** coauthor. *Population Properties of Compact Objects from the Second LIGO-Virgo Gravitational-Wave Transient Catalog*. ApJL 913 (2021).
20. *****The LIGO Scientific and Virgo Collaborations, **Z. B. Etienne** coauthor. *A Gravitational-wave Measurement of the Hubble Constant Following the Second Observing Run of Advanced LIGO and Virgo*. ApJ 909 (2021).
21. ***The LIGO Scientific and Virgo Collaborations, **Z. B. Etienne** coauthor. *All-sky search in early O3 LIGO data for continuous gravitational-wave signals from unknown neutron stars in binary systems*. Phys. Rev. D 103, 064017 (2021).

2020 Short-Author-List Papers

22. *C. W. Lewandowski, T. D. Knowles, **Z. B. Etienne**, B. D'Urso, *Active Optical Table Tilt Stabilization*. Rev. Sci. Instruments 91, 076102 (2020).
23. P. Chang, **Z. B. Etienne**, *General Relativistic Hydrodynamics on a Moving-mesh I: Static Spacetimes*. MNRAS 496, 1:206-214 (2020).
24. **V. Mewes, Y. Zlochower, M. Campanelli, T. W. Baumgarte, **Z. B. Etienne**, F. G. Lopez Armengol, F. Ciolletta, *Numerical relativity in spherical coordinates: A new dynamical spacetime and general relativistic MHD evolution framework for the Einstein Toolkit*. Phys. Rev. D 101, 104007 (2020).

2020 LIGO Scientific Collaboration Papers (on which Z. B. Etienne appears as co-author)

25. *****The LIGO Scientific and Virgo Collaborations, **Z. B. Etienne** coauthor. *GW190521: A Binary Black Hole Merger with a Total Mass of $150M_{\odot}$* . Phys. Rev. Lett. 125 (2020).
26. *****The LIGO Scientific and Virgo Collaborations, **Z. B. Etienne** coauthor. *Properties and astrophysical implications of the 150 Msun binary black hole merger GW190521*. ApJL 900:L13 (2020).
27. ***The LIGO Scientific and Virgo Collaborations, **Z. B. Etienne** coauthor. *Gravitational-wave constraints on the equatorial ellipticity of millisecond pulsars*. ApJL 902:L21 (2020).
28. *****The LIGO Scientific and Virgo Collaborations, **Z. B. Etienne** coauthor. *GW190814: Gravitational Waves from the Coalescence of a $23M_{\odot}$ Black Hole with a $2.6M_{\odot}$ Compact Object*. ApJL 896:L44 (2020).
29. *****The LIGO Scientific and Virgo Collaborations, **Z. B. Etienne** coauthor. *GW190412: Observation of a Binary-Black-Hole Coalescence with Asymmetric Masses*. Phys. Rev. D 102, 043015 (2020).
30. *****The LIGO Scientific and Virgo Collaborations, **Z. B. Etienne** coauthor. *GW190425: Observation of a Compact Binary Coalescence with Total Mass $\sim 3.4M_{\odot}$* . ApJL 892:L3 (2020).

31. ******The Fermi Gamma-ray Burst Monitor Team; and the LIGO Scientific and Virgo Collaborations, **Z. B. Etienne** coauthor. *A Joint Fermi-GBM and LIGO/Virgo Analysis of Compact Binary Mergers From the First and Second Gravitational-wave Observing Runs*. ApJ 893:100 (2020).
32. ********The LIGO Scientific and Virgo Collaborations, **Z. B. Etienne** coauthor. *A guide to LIGO-Virgo detector noise and extraction of transient gravitational-wave signals*. Class. Quantum Grav. 37 055002 (2020).
33. *******The LIGO Scientific and Virgo Collaborations, **Z. B. Etienne** coauthor. *An Optically Targeted Search for Gravitational Waves emitted by Core-Collapse Supernovae during the First and Second Observing Runs of Advanced LIGO and Advanced Virgo*. Phys. Rev. D 101, 084002 (2020).
34. ********The LIGO Scientific and Virgo Collaborations, **Z. B. Etienne** coauthor. *Model comparison from LIGO-Virgo data on GW170817's binary components and consequences for the merger remnant*. Class. Quantum Grav. 37 045006 (2020).

2019 Non-LIGO Papers (excludes three 2020 Decadal White Papers)

35. *****P. E. Nelson, **Z. B. Etienne**, S. T. McWilliams, V. Nguyen. *Induced Spins from Scattering Experiments of Initially Nonspinning Black Holes*. Phys. Rev. D, Phys. Rev. D, 100, 124045 (2019).
36. ********O. Porth, K. Chatterjee, R. Narayan, C. F. Gammie, Y. Mizuno, P. Anninos, J. G. Baker, M. Bugli, C. Chan, J. Davelaar, L. Del Zanna, **Z. B. Etienne**, et al. (EHT Collaboration paper). *The Event Horizon General Relativistic Magnetohydrodynamic Code Comparison Project*. ApJ Supp. 243, 2 (2019).
37. E. A. Huerta, et al. *Enabling real-time multi-messenger astrophysics discoveries with deep learning*. Nature Rev. Phys. 1, 10 (2019).
38. Z. J. Silberman, T. R. Adams, J. A. Faber, **Z. B. Etienne**, I. Ruchlin. *Numerical generation of vector potentials from specified magnetic fields*. J. Comp. Phys., 379 (2019).

2019 LIGO Scientific Collaboration Papers (on which Z. B. Etienne appears as co-author)

39. ********The LIGO Scientific and Virgo Collaborations, **Z. B. Etienne** coauthor. *Binary Black Hole Population Properties Inferred from the First and Second Observing Runs of Advanced LIGO and Advanced Virgo*. ApJ 882, L24 (2019).
40. ********The DES, LIGO Scientific, and Virgo Collaborations, **Z. B. Etienne** coauthor. *Low-latency Gravitational-wave Alerts for Multimessenger Astronomy during the Second Advanced LIGO and Virgo Observing Run*. ApJ 875, 161 (2019).
41. ********The LIGO Scientific and Virgo Collaborations, **Z. B. Etienne** coauthor. *First Measurement of the Hubble Constant from a Dark Standard Siren using the Dark Energy Survey Galaxies and the LIGO/Virgo BinaryBlack-hole Merger GW170814*. ApJ 876, L7 (2019).
42. ********The LIGO Scientific and Virgo Collaborations, **Z. B. Etienne** coauthor. *Narrow-band search for gravitational waves from known pulsars using the second LIGO observing run*. Phys. Rev. D 99, 122002 (2019).
43. ********The LIGO Scientific and Virgo Collaborations, **Z. B. Etienne** coauthor. *Searches for Gravitational Waves from Known Pulsars at Two Harmonics in 2015-2017 LIGO Data*. ApJ 879, 10 (2019).
44. ********The LIGO Scientific and Virgo Collaborations, **Z. B. Etienne** coauthor. *Search for Eccentric Binary Black Hole Mergers with Advanced LIGO and Advanced Virgo during their First and Second Observing Runs*. ApJ 883, 149 (2019).
45. *******The LIGO Scientific and Virgo Collaborations, **Z. B. Etienne** coauthor. *Search for gravitational-wave signals associated with gamma-ray bursts during the second observing run of Advanced LIGO and Advanced Virgo*. ApJ 886, 75 (2019).
46. *******The LIGO Scientific and Virgo Collaborations, **Z. B. Etienne** coauthor. *Search for gravitational waves from Scorpius X-1 in the second Advanced LIGO observing run with an improved hidden Markov model*. Phys. Rev. D 100, 122002 (2019).
47. ********The LIGO Scientific and Virgo Collaborations, **Z. B. Etienne** coauthor. *Search for intermediate mass black hole binaries in the first and second observing runs of the Advanced LIGO and Virgo network*. Phys. Rev. D 100, 064064 (2019).
48. ********The LIGO Scientific and Virgo Collaborations, **Z. B. Etienne** coauthor. *All-Sky Search for Short Gravitational-Wave Bursts in the Second Advanced LIGO and Advanced Virgo Run*. Phys. Rev. D 100, 024017 (2019).
49. ********The LIGO Scientific and Virgo Collaborations, **Z. B. Etienne** coauthor. *Search for sub-solar mass ultracompact binaries in Advanced LIGO's second observing run*. Phys. Rev. Lett. 123, 161102 (2019).

50. ***The LIGO Scientific and Virgo Collaborations, **Z. B. Etienne** coauthor. *All-sky search for long-duration gravitational-wave transients in the second Advanced LIGO observing run.* Phys. Rev. D 99, 104033 (2019).
51. ***The LIGO Scientific and Virgo Collaborations, **Z. B. Etienne** coauthor. *Directional limits on persistent gravitational waves using data from Advanced LIGO's first two observing runs.* Phys. Rev. D 100, 062001 (2019).
52. *****The LIGO Scientific and Virgo Collaborations, **Z. B. Etienne** coauthor. *Tests of General Relativity with the Binary Black Hole Signals from the LIGO-Virgo Catalog GWTC-1.* Phys. Rev. D 100, 104036 (2019).
53. *****The LIGO Scientific and Virgo Collaborations, **Z. B. Etienne** coauthor. *Search for the isotropic stochastic background using data from Advanced LIGO's second observing run.* Phys. Rev. D 100, 061101 (2019).
54. *****The LIGO Scientific and Virgo Collaborations, **Z. B. Etienne** coauthor. *All-sky search for continuous gravitational waves from isolated neutron stars using Advanced LIGO O2 data.* Phys. Rev. D 100, 024004 (2019).
55. *****The LIGO Scientific and Virgo Collaborations, **Z. B. Etienne** coauthor. *Tests of General Relativity with GW170817.* Phys. Rev. Lett 123, 011102 (2019).
56. *****The LIGO Scientific and Virgo Collaborations, **Z. B. Etienne** coauthor. *GWTC-1: A Gravitational-Wave Transient Catalog of Compact Binary Mergers Observed by LIGO and Virgo during the First and Second Observing Runs.* Phys. Rev. X 9, 031040 (2019).
57. ****The LIGO Scientific and Virgo Collaborations, **Z. B. Etienne** coauthor. *Search for Gravitational Waves from a Long-lived Remnant of the Binary Neutron Star Merger GW170817.* ApJ 875, 2 (2019).
58. ***The LIGO Scientific and Virgo Collaborations, **Z. B. Etienne** coauthor. *Searches for Continuous Gravitational Waves from 15 Supernova Remnants and Fomalhaut b with Advanced LIGO.* ApJ 875, 2 (2019).
59. ***The LIGO Scientific and Virgo Collaborations, **Z. B. Etienne** coauthor. *Search for Transient Gravitational-wave Signals Associated with Magnetar Bursts during Advanced LIGO's Second Observing Run.* ApJ 874, 2 (2019).
60. ***The LIGO Scientific and Virgo Collaborations, **Z. B. Etienne** coauthor. *Constraining the p-Mode-g-Mode Tidal Instability with GW170817.* Phys. Rev. Lett. 122, 061104 (2019).
61. *****The LIGO Scientific and Virgo Collaborations, **Z. B. Etienne** coauthor. *Properties of the binary neutron star merger GW170817.* Phys. Rev. X 9, 011001 (2019).
62. ***The Fermi Gamma-ray Burst Monitor Team; LIGO Scientific and Virgo Collaborations, **Z. B. Etienne** coauthor. *A Fermi Gamma-Ray Burst Monitor Search for Electromagnetic Signals Coincident with Gravitational-wave Candidates in Advanced LIGO's First Observing Run.* ApJ 871, 1 (2019).
63. ***The ANTARES, IceCube, LIGO Scientific, and Virgo Collaborations, **Z. B. Etienne** coauthor. *Search for Multimessenger Sources of Gravitational Waves and High-energy Neutrinos with Advanced LIGO during Its First Observing Run, ANTARES, and IceCube.* ApJ 870, 2 (2019).

2018 Short-Author-List Papers

64. ***I. Ruchlin, **Z. B. Etienne**, T. W. Baumgarte. *SENr/NRPy+: Numerical Relativity in Singular Curvilinear Coordinate Systems.* Phys. Rev. D 97, 064036 (2018).
65. **V. Mewes, Y. Zlochower, M. Campanelli, I. Ruchlin, **Z. B. Etienne**, T. W. Baumgarte. *Numerical relativity in spherical coordinates with the Einstein Toolkit.* Phys. Rev. D 97, 084059 (2018).
66. **T. D. Knowles, C. Devine, D. A. Buch, S. A. Bilgili, T. R. Adams, **Z. B. Etienne**, S. T. McWilliams. *Improving performance of SEOBNRv3 by $\sim 300x$.* Class. Quantum Grav. 35 155003 (2018).

2018 LIGO Scientific Collaboration Papers (on which Z. B. Etienne appears as co-author)

67. *****The LIGO Scientific and Virgo Collaborations, **Z. B. Etienne** coauthor. *Search for sub-solar mass ultracompact binaries in Advanced LIGO's first observing run.* Phys. Rev. Lett. 121, 231103 (2018).
68. *****The LIGO Scientific and Virgo Collaborations, **Z. B. Etienne** coauthor. *GW170817: Measurements of neutron star radii and equation of state.* Phys. Rev. Lett. 121, 161101 (2018).
69. *****The LIGO Scientific and Virgo Collaborations, **Z. B. Etienne** coauthor. *Prospects for observing and localizing gravitational-wave transients with Advanced LIGO, Advanced Virgo and KAGRA.* Living Rev. Relativity 21, 1 (2018).
70. *****The LIGO Scientific and Virgo Collaborations, **Z. B. Etienne** coauthor. *GW170817: Implications for the Stochastic Gravitational-Wave Background from Compact Binary Coalescences.* Phys. Rev. Lett. 120, 091101 (2018).

71. ****The LIGO Scientific and Virgo Collaborations, **Z. B. Etienne** coauthor. *A Search for Tensor, Vector, and Scalar Polarizations in the Stochastic Gravitational-Wave Background*. Phys. Rev. Lett. 120, 201102 (2018).
72. ***The LIGO Scientific and Virgo Collaborations, **Z. B. Etienne** coauthor. *Full Band All-sky Search for Periodic Gravitational Waves in the O1 LIGO Data*. Phys. Rev. D 97, 102003 (2018).
73. ****The LIGO Scientific and Virgo Collaborations, **Z. B. Etienne** coauthor. *Constraints on cosmic strings using data from the first Advanced LIGO observing run*. Phys. Rev. D 97, 102002 (2018).
74. ***The LIGO Scientific and Virgo Collaborations, **Z. B. Etienne** coauthor. *All-sky search for long-duration gravitational wave transients in the first Advanced LIGO observing run*. Class. Quantum Grav. 35 065009 (2018).
75. ****The LIGO Scientific and Virgo Collaborations, **Z. B. Etienne** coauthor. *First search for nontensorial gravitational waves from known pulsars*. Phys. Rev. Lett. 120, 031104 (2018).

2017 Short-Author-List Papers

76. ****Z. B. Etienne**, M.-B. Wan, M. C. Babiuc, S. T. McWilliams, A. Choudhary. *GiRaFFE: an open-source general relativistic force-free electrodynamics code*. Class. Quantum Grav. 34, 215001 (2017).
77. ***B. J. Kelly, J. G. Baker, **Z. B. Etienne**, B. Giacomazzo, J. Schnittman. *Prompt Electromagnetic Transients from Binary Black Hole Mergers*. Phys. Rev. D 96, 123003 (2017).

2017 LIGO Scientific Collaboration Papers (on which Z. B. Etienne appears as co-author)

78. *****LIGO Scientific and Virgo Collaborations, **Z. B. Etienne** coauthor. *GW170817: Observation of Gravitational Waves from a Binary Neutron Star Inspiral*. Phys. Rev. Lett. 119, 161101 (2017).
79. *****LIGO Scientific, Virgo, Fermi-GBM, INTEGRAL, and many more Collaborations, **Z. B. Etienne** coauthor. *Multi-messenger Observations of a Binary Neutron Star Merger*. ApJ 848:L12 (2017).
80. *****LIGO Scientific, Virgo, Fermi-GBM, and INTEGRAL Collaborations, **Z. B. Etienne** coauthor. *Gravitational Waves and Gamma-rays from a Binary Neutron Star Merger: GW170817 and GRB 170817A*. ApJ 848:L13 (2017).
81. ***LIGO Scientific, Virgo, Fermi-GBM, and INTEGRAL Collaborations, **Z. B. Etienne** coauthor. *Upper Limits on Gravitational Waves from Scorpius X-1 from a Model-Based Cross-Correlation Search in Advanced LIGO Data*. ApJ 847:47 (2017).
82. *****The LIGO Scientific and Virgo Collaborations, **Z. B. Etienne** coauthor. *GW170608: Observation of a 19 Solar-mass Binary Black Hole Coalescence*. ApJ Letters 851:L35 (2017).
83. *****The LIGO Scientific and Virgo Collaborations, **Z. B. Etienne** coauthor. *Search for Post-merger Gravitational Waves from the Remnant of the Binary Neutron Star Merger GW170817*. ApJ Letters 851:L16 (2017).
84. ****The LIGO Scientific and Virgo Collaborations, **Z. B. Etienne** coauthor. *On the Progenitor of Binary Neutron Star Merger GW170817*. ApJ Letters 850:L40 (2017).
85. *****The LIGO Scientific and Virgo Collaborations, **Z. B. Etienne** coauthor. *Estimating the Contribution of Dynamical Ejecta in the Kilonova Associated with GW170817*. ApJ Letters 850:L39 (2017).
86. *****The ANTARES, IceCube, Pierre Auger, LIGO Scientific, and Virgo Collaborations, **Z. B. Etienne** coauthor. *Search for High-energy Neutrinos from Binary Neutron Star Merger GW170817 with ANTARES, IceCube, and the Pierre Auger Observatory*. ApJ Letters 850:L35 (2017).
87. *****The LIGO Scientific and Virgo Collaborations, **Z. B. Etienne** coauthor. *A gravitational-wave standard siren measurement of the Hubble constant*. Nature 551, 85–88 (2017).
88. *****The LIGO Scientific and Virgo Collaborations, **Z. B. Etienne** coauthor. *GW170814: A Three-Detector Observation of Gravitational Waves from a Binary Black Hole Coalescence*. Phys. Rev. Lett. 119, 141101 (2017).
89. ****The LIGO Scientific and Virgo Collaborations, **Z. B. Etienne** coauthor. *First low-frequency Einstein@Home all-sky search for continuous gravitational waves in Advanced LIGO data*. Phys. Rev. D 96, 122004 (2017).
90. ****The LIGO Scientific and Virgo Collaborations, **Z. B. Etienne** coauthor. *All-sky search for periodic gravitational waves in the O1 LIGO data*. Phys. Rev. D 96, 062002 (2017).
91. ****The LIGO Scientific and Virgo Collaborations, **Z. B. Etienne** coauthor. *First narrow-band search for continuous gravitational waves from known pulsars in advanced detector data*. Phys. Rev. D 96, 122006 (2017).
92. *****ANTARES Collaboration, IceCube Collaboration, and the LIGO Scientific and Virgo Collaborations, **Z. B. Etienne** coauthor. *Search for high-energy neutrinos from gravitational wave event GW151226 and candidate LVT151012 with ANTARES and IceCube*. Phys. Rev. D 96, 022005 (2017).

93. ****The LIGO Scientific and Virgo Collaborations, **Z. B. Etienne** coauthor. *Search for intermediate mass black hole binaries in the first observing run of Advanced LIGO*. Phys. Rev. D 96, 022001 (2017).
94. *****The LIGO Scientific and Virgo Collaborations, **Z. B. Etienne** coauthor. *GW170104: Observation of a 50-Solar-Mass Binary Black Hole Coalescence at Redshift 0.2*. Phys. Rev. Lett. 118, 221101 (2017).
95. ****The LIGO Scientific and Virgo Collaborations, **Z. B. Etienne** coauthor. *Search for gravitational waves from Scorpius X-1 in the first Advanced LIGO observing run with a hidden Markov model*. Phys. Rev. D 95, 122003 (2017).
96. ****The LIGO Scientific and Virgo Collaborations, **Z. B. Etienne** coauthor. *Search for Gravitational Waves Associated with Gamma-Ray Bursts during the First Advanced LIGO Observing Run and Implications for the Origin of GRB 150906B*. ApJ 841:89 (2017).
97. ****The LIGO Scientific and Virgo Collaborations, **Z. B. Etienne** coauthor. *Effects of waveform model systematics on the interpretation of GW150914*. Class. Quantum Grav. 34, 104002 (2017).
98. *****The LIGO Scientific and Virgo Collaborations, **Z. B. Etienne** coauthor. *First Search for Gravitational Waves from Known Pulsars with Advanced LIGO*. ApJ 839:12 (2017).
99. ****The LIGO Scientific and Virgo Collaborations, **Z. B. Etienne** coauthor. *Directional Limits on Persistent Gravitational Waves from Advanced LIGO's First Observing Run*. Phys. Rev. Lett. 118, 121102 (2017).
100. *****The LIGO Scientific and Virgo Collaborations, **Z. B. Etienne** coauthor. *Upper Limits on the Stochastic Gravitational-Wave Background from Advanced LIGO's First Observing Run*. Phys. Rev. Lett. 118, 121101 (2017).
101. ****The LIGO Scientific and Virgo Collaborations, **Z. B. Etienne** coauthor. *All-sky search for short gravitational-wave bursts in the first Advanced LIGO run*. Phys. Rev. D 95, 042003 (2017).

2015–2016 Short-Author-List Papers

102. ***C. Devine, **Z. B. Etienne**, S. T. McWilliams. *Optimizing spinning time-domain gravitational waveforms for Advanced LIGO data analysis*. Class. Quantum Grav., 33, 125025/1-15 (2016).
103. *******Z. B. Etienne**, V. Paschalidis, R. Haas, P. Moesta, and S. L. Shapiro. *IllinoisGRMHD: An Open-Source, User-Friendly GRMHD Code for Dynamical Spacetimes*. Class. Quantum Grav., 32, 175009/1-33 (2015).

2015–2016 LIGO Scientific Collaboration Papers (on which Z. B. Etienne appears as co-author)

104. *****The LIGO Scientific and Virgo Collaborations, **Z. B. Etienne** coauthor. *Improved Analysis of GW150914 Using a Fully Spin-Precessing Waveform Model*. Phys. Rev. X 6, 041014 (2016).
105. *****The LIGO Scientific and Virgo Collaborations, **Z. B. Etienne** coauthor. *Properties of the Binary Black Hole Merger GW150914*. Phys. Rev. Lett. 116, 241102 (2016).

2014 Short-Author-List Papers

106. ***R. Gold, V. Paschalidis, **Z. B. Etienne**, and S. L. Shapiro. *Accretion disks around binary black holes of unequal mass: GRMHD simulations of postdecoupling and merger*. Phys. Rev. D, 90, 104030/1-15 (2014).
107. ****Z. B. Etienne**, J. G. Baker, V. Paschalidis, B. J. Kelly, and S. L. Shapiro. *Improved Moving Puncture Gauge Conditions for Compact Binary Evolutions*. Phys. Rev. D 90, 064032/1-25 (2014).

Pre-WVU-Affiliated Papers

108. ****R. Gold, V. Paschalidis, **Z. B. Etienne**, and S. L. Shapiro. *Accretion disks around binary black holes of unequal mass: GRMHD simulations near decoupling*. Phys. Rev. D, 89, 064600/1-28 (2014).
109. *****Aasi et al. (the NINJA-2, LIGO, and VIRGO Collaborations). *The NINJA-2 project: Detecting and characterizing gravitational waveforms modelled using numerical binary black hole simulations*. Class. Quantum Grav., 31, 115004/1-52 (2014).
110. *****I. Hinder, A. Buonanno, M. Boyle, **Z. B. Etienne**, J. Healy, et al. (the NRAR Collaboration). *Error-analysis and comparison to analytical models of numerical waveforms produced by the NRAR Collaboration*. Class. Quantum Grav., 31, 025012/1-47 (2013).
111. Ajith et al. (the NINJA-2 Collaboration). *Addendum to “The NINJA-2 catalog of hybrid post-Newtonian/numerical-relativity waveforms for non-precessing black-hole binaries”*. Class. Quantum Grav., 30, 199401/1-2 (2013).

112. ****V. Paschalidis, **Z. B. Etienne**, and S. L. Shapiro. *General relativistic simulations of binary black hole-neutron stars: Precursor electromagnetic signals*. Phys. Rev. D, 88, 021504(R)/1-6 (2013).
113. ******Z. B. Etienne**, V. Paschalidis, and S. L. Shapiro. *General relativistic simulations of black hole-neutron star mergers: Effects of tilted magnetic fields*. Phys. Rev. D, 86, 084026/1-6 (2012).
114. ****V. Paschalidis, **Z. B. Etienne**, and S. L. Shapiro. *Importance of cooling in triggering the collapse of hypermassive neutron stars*. Phys. Rev. D, 86, 064032/1-13 (2012).
115. ****B. D. Farris, R. Gold, V. Paschalidis, **Z. B. Etienne**, and S. L. Shapiro. *Binary black hole mergers in magnetized disks: simulations in full general relativity*. Phys. Rev. Lett., 109, 221102/1-5 (2012).
116. Ajith et al. (the NINJA-2 Collaboration). *The NINJA-2 catalog of hybrid post-Newtonian/numerical-relativity waveforms for non-precessing black-hole binaries* Class. Quantum Grav., 29, 124001/1-27 (2012),
117. ******Z. B. Etienne**, Y. T. Liu, V. Paschalidis, and S. L. Shapiro *General Relativistic Simulations of Black Hole-Neutron Star Mergers: Effects of magnetic fields*. Phys. Rev. D, 85, 064029/1-30 (2012).
118. ******Z. B. Etienne**, V. Paschalidis, Y. T. Liu, and S. L. Shapiro *Relativistic magnetohydrodynamics in dynamical spacetimes: Improved electromagnetic gauge condition for adaptive mesh refinement grids*. Phys. Rev. D, 85, 024013/1-10 (2012).
119. ***V. Paschalidis, **Z. B. Etienne**, Y. T. Liu, and S. L. Shapiro *Merger of binary white dwarf-neutron stars: Simulations in full general relativity*. Phys. Rev. D, 84, 104032/1-24 (2011).
120. ***V. Paschalidis, **Z. B. Etienne**, Y. T. Liu, and S. L. Shapiro *Head-on collisions of binary white dwarf-neutron stars: Simulations in full general relativity*. Phys. Rev. D, 83, 064002/1-23 (2011).
121. ******Z. B. Etienne**, Y. T. Liu, and S. L. Shapiro *Relativistic magnetohydrodynamics in dynamical spacetimes: A new adaptive mesh refinement implementation*. Phys. Rev. D, 82, 084031/1-21 (2010).
122. ***Y. T. Liu, **Z. B. Etienne**, and S. L. Shapiro *Evolution of near-extremal-spin black holes using the moving puncture technique*. Phys. Rev. D, 80, 121503/1-5 (2009).
123. *****Aylott et al. (the NINJA Collaboration). *Testing gravitational-wave searches with numerical relativity waveforms: Results from the first Numerical INjection Analysis (NINJA) project*. Class. Quantum Grav., 26, 165008/1-51 (2009).
124. *****Cadonati et al. (the NINJA Collaboration). *Status of NINJA: the Numerical INjection Analysis project*. Class. Quantum Grav., 26, 114008/1-13 (2009).
125. *T. W. Baumgarte, **Z. B. Etienne**, Y. T. Liu, K. Matera, N. Ó. Murchadha, S. L. Shapiro, & K. Taniguchi. *Equilibrium initial data for moving puncture simulations: the stationary 1 + log slicing*. Class. Quantum Grav., 26, 085007/1-17 (2009).
126. *******Z. B. Etienne**, Y. T. Liu, S. L. Shapiro and T. W. Baumgarte. *Relativistic simulations of black hole-neutron star mergers: Effects of black hole spin*. Phys. Rev. D, 79, 044024/1-26 (2009).
127. *****Y. T. Liu, S. L. Shapiro, **Z. B. Etienne** and K. Taniguchi. *General relativistic simulations of magnetized binary neutron stars*. Phys. Rev. D, 78, 024012/1-20 (2008).
128. *******Z. B. Etienne**, J. A. Faber, Y. T. Liu, S. L. Shapiro, T. W. Baumgarte, and K. Taniguchi. *Fully general relativistic simulations of black hole-neutron star mergers*. Phys. Rev. D, 77, 084002/1-22 (2008).
129. ******Z. B. Etienne**, J. A. Faber, Y. T. Liu, S. L. Shapiro, and T. W. Baumgarte. *Filling the holes: Evolving excised binary black hole initial data with puncture techniques*. Phys. Rev. D, 76, 101503/1-5 (2007).
130. ***J. A. Faber, T. W. Baumgarte, **Z. B. Etienne**, S. L. Shapiro, and K. Taniguchi. *Relativistic hydrodynamics in the presence of puncture black holes*. Phys. Rev. D, 76, 104021/1-21 (2007).
131. *****Z. B. Etienne**, Y. T. Liu, and S. L. Shapiro. *General Relativistic Simulations of Slowly and Differentially Rotating Magnetized Neutron Stars*. Phys. Rev. D, 74, 044030/1-21 (2006).
132. V. S. Morozov, **Z. B. Etienne**, M.C. Kandes, A. D. Kirsch, M. A. Leonova, D. W. Sivers, V. K. Wong, K. Yonehara, V. A. Anferov, H. O. Meyer, P. Schwandt, E. J. Stephenson, & B. von Przewoski. *First Spin Flipping of a Stored Spin-1 Polarized Beam*. Phys. Rev. Lett., 91, 214801/1-4 (2003).
133. B. V. Przewoski, V. A. Anferov, H. O. Meyer, P. Schwandt, E. J. Stephenson, V. S. Morozov, **Z. B. Etienne**, M. C. Kandes, M. A. Leonova, D. W. Sivers, & K. Yonehara. *Vector and tensor polarization lifetimes for a stored deuteron beam*. Phys. Rev. E, 68, 046501 (2003).
134. B. B. Blinov, **Z. B. Etienne**, A. D. Kirsch, M. A. Leonova, W. Lorenzon, V. S. Morozov, C. C. Peters, V. K. Wong, K. Yonehara, V. A. Anferov, P. Schwandt, E. J. Stephenson, B. von Przewoski, & H. Sato. *99.6% Spin-Flip Efficiency in the Presence of a Strong Siberian Snake*. Phys. Rev. Lett., 88, 014801/1-4 (2001).

- Chapters in Professional Books:

- **Z. B. Etienne**, V. Paschalidis, and S. L. Shapiro. *Advanced Models of Black Hole-Neutron Star Binaries*

and Their Astrophysical Impact, in C. F. Sopuerta (Ed.), *Gravitational Wave Astrophysics: Proceedings of the Third Session of the Sant Cugat Forum on Astrophysics*, Vol 40, pp 59–74 (2014). Springer.

- Other: Papers in Conference Proceedings:
 - **Z. B. Etienne**, Y. T. Liu, V. Paschalidis, and S. L. Shapiro. *Numerical Relativity Simulations of Magnetized Black Hole-Neutron Star Mergers*, in R. T. Jantzen, K. Rosquist, R. Ruffini (Eds.) *Proceedings of the 13th Marcel Grossmann Meeting* (2015). World Scientific, Singapore. Not refereed.

Distinguished Talks

2021 *BlackHoles@Home Status Report*

- Invited Talk, American Astronomical Society January Meeting, NASA Physics of the Cosmos Invited Session, held virtually

NRPy+, a Python-Based Code Generation Package for Numerical Relativity... and Beyond!

- Invited Talk, SIAM Conference on Computational Science and Engineering “Applications of Code Generation and HPC to Complex Dynamical Systems” Minisymposium, held virtually
- Invited Talk, APS April Meeting “Applications of Code Generation and High Performance Computing to Astrophysical Systems”, held virtually

Advancing Multimessenger Astrophysics with Next-Generation Black Hole and Neutron Star Binary Merger Simulations

- U. of Idaho/Washington State University Joint Physics Colloquium, Moscow, ID.
- Mathematics, Astronomy, Physics, and Computation Seminar, National University of Córdoba, Córdoba, Argentina
- U. of Idaho Physics Colloquium, Moscow, ID.

2020 *Advancing Multimessenger Astrophysics with Next-Generation Black Hole and Neutron Star Binary Merger Simulations*

- Interdisciplinary Center for Theoretical Study Seminar, U. of Science and Technology of China, Hefei.
- Fundamental Theory Seminar, Penn State University.

When black holes and neutron stars collide: Simulating the most extreme events in the Universe

- WVU Planetarium Invited Talk
- Tri-State Astronomers Club, Hagerstown Invited Talk
- Cornell Astronomical Society Invited Talk

BlackHoles@Home Status Report

- ICERM Advances in Computational Relativity Workshop Invited Talk, Brown University

2019 *The BlackHoles@Home Project: Black Hole Binaries on the Desktop Computer*

- Invited press conference at the 2019 April American Physical Society Meeting
- Accepted talk at 2019 GR22 Conference in Valencia, Spain

Advancing Multimessenger Astrophysics with Next-Generation Black Hole and Neutron Star Binary Merger Simulations

- West Virginia University Physics & Astronomy Department Colloquium
- Beijing Normal University Astronomy Department Seminar

NRPy+: A new tool for numerical relativity

- Invited talk at 2019 Einstein Toolkit Workshop, King’s College London

NRPy+ : Enabling general relativistic binary black hole simulations on your laptop!

- Invited talk at U. of Chinese Academy of Sciences, School of Physics Research Seminar, Beijing

BlackHoles@Home/NRPy+ : Numerical Relativity in Singular Curvilinear Coordinates

- Invited talk at SIAM CSE Numerical Relativity Mini-Symposium, Spokane, Washington

Porting General Relativity to Python, for the Benefit of Astrophysics

- Invited talk Morgantown Codes (local group of professional software developers) Meeting, Morgantown, West Virginia

2018 *When Neutron Stars Collide! Gravitational Waves, Gamma-Ray Bursts, and the Ring on Your Finger*

- The 21st Eastern Gravity Meeting Public Talk, Long Island University-Brooklyn.
- Invited Seminar for REU students, Center for Computational Relativity and Gravitation, Rochester Institute of Technology

SENR/NRPy+, BlackHoles@Home, ... and Beyond! Numerical Relativity in Singular, Curvilinear Coordinate Systems

- Invited Talk, NCSA Workshop: Deep Learning for Multimessenger Astrophysics: Real-time Discovery at Scale, National Center for Supercomputing Applications, Urbana, IL.

Colliding Black Holes!

- Invited Public Talk, Blackwater Falls Astronomy Weekend, Blackwater Falls State Park, West Virginia

NRPy+ : A new Python-based code-generation package for numerical relativity... and beyond!

- Invited Talk, European Einstein Toolkit Workshop, Lisbon, Portugal.

NRPy+ Tutorial

- Invited tutorial, Numerical Relativity beyond General Relativity, Benasque, Spain
- Invited tutorial, Einstein Toolkit Workshop 2018, Georgia Institute of Technology

2017 *Gravitational Waves, Colliding Neutron Stars, and You*

- Invited Special Colloquium on GW170817, West Virginia University Department of Physics & Astronomy

When Black Holes Collide! Gravitational Waves and Other Tales from the Horizon

- Public Talk, 2017 *Celebrating Einstein* event at West Virginia University.
- Invited Seminar for REU students, Center for Computational Relativity and Gravitation, Rochester Institute of Technology

Electromagnetic Counterparts to Gravitational Wave Detections: Bridging the Gap between Theory and Observation

- Invited Seminar, Shanghai Astronomical Observatory.
- Invited Seminar, Zhejiang University of Technology.
- Invited Colloquium, Kavli Institute for Astronomy and Astrophysics.
- Invited Seminar, Center for Computational Relativity and Gravitation, Rochester Institute of Technology.
- Invited Seminar, Relativistic Astrophysics seminar, Montana State University.

SENR: A Super-Efficient Numerical Relativity Code for the Age of Gravitational Wave Astrophysics

- Selected Talk, American Physical Society April Meeting, Washington, DC.
- Selected Talk, 20th Eastern Gravity Meeting, Penn State University.

2016 *SENR: A Super-Efficient Numerical Relativity Code for the Age of Gravitational Wave Astronomy*

- Selected Talk, 2016 Joint Space–Science Institute Workshop: “Astrophysics in the Era of Gravitational Wave and Multimessenger Observations”.

2015 *An Overview of IllinoisGRMHD*

- Invited Talk, 2015 Einstein Toolkit Workshop.

Numerical Relativity’s Contribution to Theoretical Astrophysics, and Its Path Forward

- Invited Talk, 2015 American Physical Society April Meeting.
- Colloquium, National Radio Astronomy Observatory, Green Bank, WV.
- Invited Talk, 2015 American Physical Society Mid-Atlantic Section Meeting.

GRMHD modeling of the most luminous outbursts in the Universe

- Invited Talk, University of Trento.

West Virginia University LSC New Senior Member Application Presentation

- Invited Talk, 2015 LIGO Scientific Collaboration Pasadena Meeting.

2014 *A Man, a Plan, a Code, a New Technique (or Two), ... Panama?*

- Invited Talk, Rochester Institute of Technology Center for Computational Relativity and Gravitation.

Modeling of Black Hole–Neutron Star Systems and Their Astrophysical Impact

- Plenary Talk, Sant Cugat Forum on Astrophysics, Sant Cugat, Barcelona, Spain

Throwing in the Kitchen Sink: Adding Mixed-Type PDEs to Better Solve Einstein’s Equations

- Invited Talk, Applied Analysis Seminar, West Virginia University Department of Mathematics.

2013 *Can Black Hole–Neutron Star Binary Mergers Produce Gamma-Ray Bursts?*

- Invited Talk, Joint Space–Science Institute Mini-Symposium, University of Maryland.
- Seminar, Theoretical AstroPhysics Including Relativity and Cosmology (TAPIR), California Institute of Technology.
- Seminar, General Relativity Theory Seminar, University of Maryland.
- Colloquium, Shanghai–Jiaotong University Center for Astrophysics, Shanghai, China.
- Colloquium, Shanghai Astronomical Observatory, Shanghai, China.
- Seminar, Center for Gravitation, Cosmology & Astrophysics Seminar, University of Wisconsin–Milwaukee
- Colloquium, Computational Data Mining and Analysis Center, Virginia Tech

2013 *Solving the Einstein–Maxwell Equations to Model the Most Energetic Outbursts in the Universe*

- Colloquium, Department of Mathematics, West Virginia University

- 2012 *Simulations of Magnetized Neutron Star–Black Hole Binaries in Full General Relativity*
- Invited Talk, 13th Marcel Grossmann Meeting, Stockholm, Sweden.
 - Selected Talk, KITP Conference: Rattle and Shine: Gravitational Wave and Electromagnetic Studies of Compact Binary Mergers, Santa Barbara, California.
- 2011 *Numerical Simulations of Binary Systems with Matter Companions.*
- Invited Talk, 2011 APS April Meeting, Anaheim, California.
- 2010 *Fully General Relativistic Simulations of Black Hole–Neutron Star Mergers: A Current Overview.*
- Invited Talk, Numerical Relativity Data Analysis (NRDA) Conference, Perimeter Institute, Waterloo, Ontario.
 - Seminar, Peking University, National Observatory, and Institute of High Energy Physics Joint Seminar, Beijing, China.
 - Colloquium, Shanghai Astronomical Observatory, Shanghai, China.
- 2009 *Simulations of Black Hole–Neutron Star Binary Mergers: Gravitational Waves and Gamma-Ray Bursts.*
- Seminar, Center for Gravitation & Cosmology, University of Wisconsin-Milwaukee.