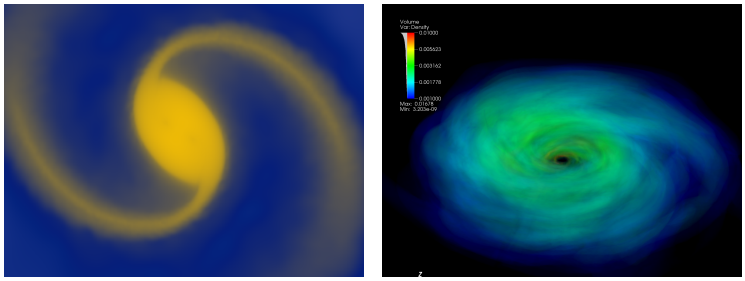
Jonah M. Miller

(A) (B)

Figure (right): *(A)* Merger of two neutron stars. *(B)* Accretion disk around a black hole formed after a neutron star merger [18].



Education

B.A in Physics:
Summa cum laude awarded for honors research.
University of Colorado at Boulder
Thesis: *Optimizing and Applying Graphene for Generating Ultrashort Pulses*
Awarded May 2013
GPA: 3.626/4.0

B.A. in Mathematics:
Summa cum laude awarded for honors research.
University of Colorado at Boulder
Thesis: *A Characterization of Affine Minimal and Affine Flat Surfaces*
Awarded May 2013
GPA: 3.626/4.0

Ph.D. in Physics:
Guelph-Waterloo Physics Institute
Perimeter Institute for Theoretical Physics
Thesis: *Selected Problems in Computational Gravity*
Defended July 2017.
GPA: 92.75/100.0

Research Experience

Computational Physics
at Los Alamos National Laboratory
Scientist 2
October 2019 – Present
Los Alamos, NM

Accomplishments in this role include:

- Developed the singularity-eos equation of state library and suite of codes. This software was picked up by by the IC-XCAP project. I am now chief architect.
- Co-Founded the Parthenon collaboration which developers the successful Parthenon adaptive mesh refinement library [5] [64].
- Co-developed and acted as team lead for the Phoebus relativistic astrophysics code for the Next Generation Platforms project.
- Co-developed the Riot prototyping code for the LANL ASC program.
- Successfully applied for multiple grants and computing allocations.
- Successfully mentored multiple graduate students and a postdoc.
- Maintained an open science research program.

Broadly, some of my research interests are:

- Performance portability and running simulations efficiently on novel hardware
- Multiscale methods and novel numerical methods
- Multiphysics at scale including fluid dynamics and radiation transport
- Compact object astrophysics and astrophysical transients

Astrophysics **HPC** **Numerics**

Computational Astrophysics
at Los Alamos National Laboratory
Postdoc Research Associate
CNLS Fellow
September 2017–September 2019
Los Alamos, NM

I was a postdoc and CNLS postdoctoral fellow from 2017 to 2019. During this time, I:

- Developed a general relativistic radiation magnetohydrodynamics code [18] and now applying it to compact object astrophysics where all four fundamental forces of nature are relevant, such as the accretion disks that result from the merger of two neutron stars [16].
- Mentored a student to develop robust and efficient Spectral methods for problems with shocks and discontinuities [21].

Relativistic astrophysics **High-performance computing** **Radiation transport** **Magnetohydrodynamics** **Numerical methods**

Computational Astrophysics
at Los Alamos National Laboratory
Graduate Research Fellow
June 2016–August 2016
Los Alamos, NM

Graduate fellow in the 2016 Co-Design Summer School. Upgraded the highly scalable smoothed particle hydrodynamics code SNSPH to simulate the in-spiral and merger of two neutron stars at extremely high resolution, with the goal of understanding the morphology of ejected material.

- Helped lead an interdisciplinary team of computer scientists, physicists and mathematicians.
- Augmented SNSPH with new physics including: gravitational wave radiation-reaction, realistic equations of state for hot and cold neutron star matter, and realistic initial data.
- Maintained code performance

Relativistic Astrophysics **High-Performance Computing** **Smoothed-Particle Hydrodynamics** **Co-Design**

Numerical Relativity
at the University of Guelph
Graduate Research Assistant
August 2013–September 2017
Guelph, ON

Graduate research for a Ph.D. under Erik Schnetter (`http://www.perimeterinstitute.ca/personal/eschnetter/`).

- Developed a formulation of discontinuous Galerkin (DG) methods for the BSSN formulation of the Einstein equations [26].
- As part of the SpECTRE collaboration, helped develop a new relativistic astrophysics code based on task-based parallelism and DG methods [25].
- In collaboration with the developers of the yt-project, to visualized numerical relativity data generated with the Einstein Toolkit. Gave a progress report at the 2015 Einstein Toolkit workshop at NORDITA [62]. Presented a tutorial at 2016 Einstein Toolkit workshop in Trento [58].

Numerical Relativity **High-Performance Computing** **Numerical Methods**

Differential Geometry
at University of Colorado
Undergraduate Research Assistant
January 2012–August 2013
Boulder, CO

Research for undergraduate honors thesis in Math under advisor Jeanne Clelland (`http://math.colorado.edu/~jnc`). Used Cartan's method of moving frames to study curves and surfaces in equiaffine space.

- Co-authored a paper on geometry in affine space. Defined commensurate curves, proved theorems on existence/uniqueness, and generated examples [28].
- Characterized all surfaces in equiaffine space that are both flat and minimal. Wrote and defended an honors thesis on the topic [33]. Wrote a paper with Jeanne Clelland [29].

Geometry **Differential Forms** **Moving Frames**

Quantum Gravity
at University of California, Davis
Undergraduate Research Assistant
June 2012–August 2013
Davis, CA

Research during a summer fellowship: the Research Experience for Undergraduates (REU) program funded by the National Science Foundation (NSF) under advisor Steve Carlip (http://goober.ucdavis.edu/Text/Carlip.html). Studied Causal Dynamical Triangulations, a non-perturbative approach to quantum gravity, in 2+1 dimensions.

- Simulated the quantum universe in 2+1 dimensions using Monte Carlo methods and Regge calculus.
- Explored transitions with fixed boundaries.
- Wrote two papers in collaboration with Joshua Cooperman and Kyle Lee [30, 24].

Quantum Gravity **General Relativity** **Monte Carlo Methods**

Quantum Optics
at University of Colorado
Undergraduate Research Assistant
May 2010–December 2011
Boulder, CO

Research for undergraduate honors thesis in Physics under advisor Thomas Schibli (http://spot.colorado.edu/~trs). Studied the applications of graphene as a saturable absorber for mode-locked lasers.

- Optimized chemical vapor deposition process and transfer to generate graphene.
- Developed a differential reflectivity system to measure the saturable absorption of graphene.
- Used Raman spectroscopy and differential reflectivity to study graphene p-doped by nitric acid.
- Wrote an honors thesis [34], and co-authored a paper on graphene [31].

Graphene **Ultrafast Optics** **Semiconductors**
Raman Spectroscopy **Material sciences**

Non-Research Experience

Perimeter Institute
for Theoretical Physics
Research Computing Assistant
August 2014–September 2017
Waterloo, ON

Helped faculty and students at Perimeter utilize our computing resources. Duties included:

- Consulting with researchers on numerical algorithms, code optimization, and visualization techniques.
- Training researchers to program and think about code, both through lectures and one-on-one.
- Managing Perimeter's high-performance computing cluster.
- Collaborating with researchers on a long-term basis to help them solve their research problems numerically. One such collaboration resulted in a paper, published in the Journal of High Energy Physics, of which I am a co-author [27].

Teaching **Consulting** **High-Performance Computing**
System Administration **Numerical Methods** **Optimization**

University of Guelph
Graduate Teaching Assistant
August 2013–May 2015
Guelph, ON

Led tutorial and laboratory sessions, graded homework and quizzes, proctored exams, and tutored students one-on-one for the following courses:

- Physics for the Life Sciences, an introductory undergraduate course.
- Electromagnetic Theory, an advanced undergraduate course for physics majors.

Grading **Exam proctoring** **Tutorial sessions** **One-on-one instruction** **Laboratory exercises**

University of Colorado
Undergraduate Grader
August 2012–December 2012
Boulder, CO

Graded *The Geometry of Curves and Surfaces* for Jeanne Clelland (http://math.colorado.edu/~jnc). The course covered introductory differential geometry for manifolds of one and two dimensions, mostly embedded in $\mathbb{R}^3$, and used the textbook *Differential Geometry and Its Applications* by John Oprea.

Maple **Geometry** **Grading**

Teaching Assistant at the University of Guelph
Graduate Teaching Assistant
August 2013–May 2014
Guelph, ON

I was a graduate TA the University of Guelph. Duties included:

- Marking student quizes, and helping them improve one-on-one after the quiz.
- Leading laboratory exercises
- Running tutorial sessions where I helped the students with their homework.
- Grading student homework.

Teaching **Grading** **One-on-one instruction**

Mentorship Activities

Brandon Barker
PhD Student at
Michigan State University
October 2022–Present
Los Alamos, NM

Brandon is a PhD student working with me on modeling the deaths of massive, rapidly rotating stars.

Astrophysical Transients **Nucleosynthesis** **Collapsars**

Mariam Gogilashvili
PhD Student at
Florida State University
October 2022–Present
Los Alamos, NM

Mariam was awarded a CSES student fellowship to work with me on simulations of core-collapse supernovae.

Astrophysical Transients **Nucleosynthesis** **Supernovae**

Kelsey Lund
PhD Student at
North Carolina State University
July 2021–Present
Los Alamos, NM

Kelsey is a PhD student working with myself and Matt Mumpower on nuclear physics and neutron star mergers.

Astrophysical Transients **Nucleosynthesis** **Kilonova**

Soumi De
Directors Fellow at
Los Alamos National Laboratory
September 2020–Present
Los Alamos, NM

Soumi is a LANL Directors' fellow working with me on machine learning for neutron star mergers. Soumi is currently in the process of converting to staff in T-5.

Machine Learning **Astrophysical Transients**

Sanjana Curtis
PhD Student at
North Carolina State university
October 2019–November 2020
Los Alamos, NM

Visited Los Alamos to work with me on modeling astrophysical transients. Sanjana has completed one publication on supernova light curves [8] and one Letter on post-merger accretion disks [1]. She was recently awarded an NSF postdoctoral fellowship.

Astrophysical Transients **Nucleosynthesis** **Kilonova**

Joanna Piotrowska
PhD Student at
University of Cambridge (UK)
June 2017–Present
Waterloo, ON
Los Alamos, NM

Joanna developed a way of attaining exponential convergence for spectral representations of discontinuous functions, offering a potential highly efficient alternative to Gudonov-like schemes. Joanna presented her method in a paper [21] which has been published in the journal of computational physics. She is now developing applications of the approach for nonlinear flux-conservative systems and wrote a report on her developments [14].

Hyperbolic PDEs **Spectral Methods**
High-Resolution Shock Capturing

Damodar Rajbhandari
Undergraduate Student at
St. Xavier's College
January 2016–2019
Kathmandu

Mentored Damodar remotely on a theory of quantum gravity—Causal Dynamical Triangulations (CDT) in 1+1 dimensions—for his undergraduate honors thesis. Damodar is now a Masters' student at the University of Nijmegen.

Quantum Gravity **Causal Dynamical Triangulations** **Geometry**
General Relativity **Simplicial Manifolds** **Regge Calculus**
Monte Carlo Methods

Selected Honors and Awards

- Awarded three LANL spot awards so far.
- Awarded an LDRD early career award, starting summer of FY22
- Awarded more than 40 million CPU hours of IC computing time
- Awarded a Venado Pathways allocation
- Awarded several CSES rapid response and student fellowships
- Awarded the LANL Center for Nonlinear Studies (CNLS) postdoctoral fellowship starting in June 2018.
- Awarded the CPES Dean's Scholarship at the University of Guelph (Fall 2013).
- *Summa cum laude* in Mathematics for an undergraduate honors thesis in math [33]. Thesis can be found here: http://www.thephysicsmill.com/blog/wp-content/uploads/affine_minimal_and_flat_surfaces.thesis.archival_copy.pdf.
- *Summa cum laude* in Physics for an undergraduate honors thesis in physics [34]. Thesis can be found here: http://www.thephysicsmill.com/blog/wp-content/uploads/jm_thesis_draft_3.pdf.

Outreach Activities

- I have been invited to write a number of public outreach articles online including: an expert review of an online class on numerical methods [69] and an interview on stemwomen.net, a website devoted to encouraging women to pursue STEM fields [68].
- I have also been interviewed as a science expert several times: once for an article on penny4nasa.org [70], once for the podcast Tilting at the Universe [67], and once for a space advocate's personal blog [71].

- My article on the Equivalence Principle in general relativity has been translated into Italian by an Italian physics educator. The translation can be found here: http://www.tutto-scienze.org/2016/01/galileo-aveva-quasi-scoperto-la.html.
- I have visited classrooms at several levels and given talks on space, astrophysics, and astronomy.
- I regularly give talks at the local planetarium and participated in "science on tap" events.

Service

- I was tapped to be the CCS-2 representative for a CCS-division early career group, where we have organized social events, educational events and tours, and recently hosted a successful "pitch day" to provide seed grants to early career researchers.
- In the summer of 2020, motivated by the conversations around to Black Lives Matter, I help develop and achieve buy-in for *Statement of Values* for the LANL center for theoretical astrophysics. The statement is now on the organization's website.
- I have been on several funding panels, including two LDRD DR panels, where I have acted as assistant chair.
- I am regularly tapped as a reviewer for LANL centers.
- I regularly participate in peer review.

Fun Stuff

- Namesake of a warp drive in the Warrior Chronicles, by Sean Jones.
- Erdos number of 4.
- Linux hobbyist
- Avid skier and hiker
- Likes board games

Citation Information/Metrics

All metrics/citations from Google Scholar, as of March 18, 2023.

Metric	All	Since 2018
Total citations	784	692
h-index	15	14
i10-index	18	17

Selected Journal Articles

[1] S. Curtis, **J. M. Miller**, et al. Nucleosynthesis in outflows from black hole–neutron star merger disks with full gr(ν)rmhd. *The Astrophysical Journal Letters*, 945(1):L13, mar 2023.

[2] M. M. Meskhi et al. A new constraint on the nuclear equation of state from statistical distributions of compact remnants of supernovae. *The Astrophysical Journal Letters*, 932(1):L3, jun 2022. Preprint available at arXiv:2111.01815.

[3] **J. M. Miller**, J. C. Dolence, and D. Holladay. Not-Quite Transcendental Functions and their Applications. *arXiv e-prints*, page arXiv:2206.08957, June 2022.

[4] R. Bujack et al. The non-riemannian nature of perceptual color space. *Proceedings of the National Academy of Sciences*, 119(18):e2119753119, 2022.

[5] P. Grete, J. C. Dolence, **J. M. Miller**, et al. Parthenon—a performance portable block-structured adaptive mesh refinement framework. *The International Journal of High Performance Computing Applications*, 0(0):10943420221143775, 2022.

[6] Emily S. Teti, Terece L. Turton, Jonah M. Miller, and Roxana Bujack. Maximum likelihood estimation of difference scaling functions for suprathreshold judgments. *Journal of Vision*, 22(10):9–9, 09 2022.

[7] **J. M. Miller** et al. Spiner: Performance portable routines for generic, tabulated, multi-dimensional data. *Journal of Open Source Software*, 7(75):4367, 2022.

[8] S. Curtis et al. Core-collapse supernovae: From neutrino-driven 1d explosions to light curves and spectra. *The Astrophysical Journal*, 921(2):143, nov 2021.

[9] O. Korobkin et al. Axisymmetric radiative transfer models of kilonovae. *The Astrophysical Journal*, 910(2):116, 2021.

[10] A. R. Stewart et al. Realistic kilonova up close. In *Supercomputing 21*, 2021. Preprint available at arXiv:2201.01865.

[11] W. Even et al. Composition Effects on Kilonova Spectra and Light Curves. I. *The Astrophysical Journal*, 899(1):24, August 2020.

[12] G. Salveson and **J. M. Miller**. Black hole spin in X-ray binaries: giving uncertainties an f. *Monthly Notices of the Royal Astronomical Society*, 500(3):3640–3666, 10 2020.

[13] **J. M. Miller** et al. Full transport general relativistic radiation magnetohydrodynamics for nucleosynthesis in collapsars. *The Astrophysical Journal*, 902(1):66, 2020.

[14] J. Piotrowska and **J. M. Miller**. Spectral shock detection for dynamically developing discontinuities. *arXiv e-prints*, page arXiv:1910.00858, October 2019.

[15] C. L. Fryer et al. Understanding the engines and progenitors of gamma-ray bursts. *European Physical Journal A*, 55(8):132, August 2019.

[16] **J. M. Miller** et al. Full transport model of gw170817-like disk produces a blue kilonova. *Phys. Rev. D*, 100:023008, Jul 2019.

[17] N. M. Lloyd-Ronning et al. Constraints on gamma-ray burst inner engines in a Blandford-Znajek framework. *Monthly Notices of the Royal Astronomical Society*, 485:203–210, May 2019.

[18] **J. M. Miller**, B. R. Ryan, and J. C. Dolence. `nubhlight`: Radiation GRMHD for Neutrino-Driven Accretion Flows. *The Astrophysical Journal Supplement Series*, 241(2):30, apr 2019.

[19] C. L. Fryer et al. Catching Element Formation In The Act. *White Paper*, page arXiv:1902.02915, Feb 2019.

[20] E. A. Huerta et al. Enabling real-time multi-messenger astrophysics discoveries with deep learning. *Nature Reviews Physics*, 1(10), 10 2019.

[21] J. Piotrowska, **J. M. Miller**, and E. Schnetter. Spectral methods in the presence of discontinuities. *Journal of Computational Physics*, 390:527 – 547, 2019.

[22] D. S. Katz et al. Fourth Workshop on Sustainable Software for Science: Practice and Experiences (WSSSPE4). *Journal of Open Source Research Software*, 6(1), 2018.

[23] F. Queiroz et al. Good Usability Practices in Scientific Software Development. In *WSSSPE5*, August 2017.

[24] J. H. Cooperman, K. Lee, and **J. M. Miller**. A second look at transition amplitudes in (2+1)-dimensional causal dynamical triangulations. *Classical and Quantum Gravity*, 34(11), May 2017.

[25] L E. Kidder et al. SpECTRE: A task-based discontinuous Galerkin code for relativistic astrophysics. *Journal of Computational Physics*, 335:84–114, April 2017.

[26] **J. M. Miller** and E. Schnetter. An operator-based local discontinuous galerkin method compatible with the bssn formulation of the einstein equations. *Classical and Quantum Gravity*, 34(1):015003, 2017.

[27] P. Lunts et al. Ab initio holography. *Journal of High Energy Physics*, 2015(8), 2015.

[28] J. Clelland et al. A tale of two arc lengths: Metric notions for curves in surfaces in equiaffine space. *Proceedings of the American Mathematical Society*, 142(7):2543–2558, July 2014.

[29] J. N. Clelland and **J. M. Miller**. A characterization of hyperbolic affine flat, affine minimal surfaces in $\mathbb{A}^3$. *Differential Geometry and its Applications*, 36:134 – 148, 2014.

[30] J.H. Cooperman and **J. M. Miller**. A first look at transition amplitudes in (2+1)-dimensional causal dynamical triangulations. *Classical and Quantum Gravity*, 31(035012), 2014.

[31] C.-C. Lee, **J. M. Miller**, and T. R. Schibli. Doping-induced changes in the saturable absorption of monolayer graphene. *Applied Physics B*, 108(1):129–235, 2012.

Theses

[32] J.M. Miller. *Selected Problems in Computational Gravity*. PhD thesis, University of Guelph, Guelph, ON, July 2017.

[33] J.M. Miller. A characterization of affine minimal and affine flat surfaces. Undergraduate honors thesis, University of Colorado at Boulder, March 2013.

[34] J.M. Miller. Optimizing and applying graphene as a saturable absorber for generating ultrashort pulses. Undergraduate honors thesis, University of Colorado at Boulder, November 2011.

Selected Invited Talks

[35] J. M. Miller. Compact object astrophysics on chicoma. In *Los Alamos Naitonal Laboratory Institutional Computing User Group Meeting*, March 2023.

[36] J. M. Miller and D. Holladay. Design philosophy of and lessons learned from singularity-eos. In *XCAP Seminar Series*, January 2023.

[37] J. M. Miller. High performance computing and nuclear astrophysics. In *Hamburg Observatory Seminar Series*, December 2022.

[38] J. M. Miller. Impact of neutrinos in post-merger accretion flows. In *WE-Heraeus-Seminar 774, Kilonova: Multimessenger and Multiphysics*, November 2022.

[39] J. M. Miller. Post-merger disks with full neutrino physics. In *Remnants of Neutron Star Mergers: Connecting Hydrodynamics Models Nuclear, Neutrino, and Kilonova Physics*, October 2022.

[40] J. M. Miller. Neutrino transport and effects on observables in compact binary mergers. In *International School of Nuclear Physics 43rd Course: Neutrinos in Cosmology,in Astro-, Particle- and Nuclear Physics*, September 2022.

[41] J. M. Miller. End to end modeling of a kilonova. In *University of Mexico, Department of Physics, Gravity Seminar*, August 2021.

[42] J. M. Miller. Impact of full neutrino transport on post-neutron star merger disks. In *Probing Nuclear Physics with Neutron Star Mergers*, July 2021.

[43] J. M. Miller. Neutrino transport. In *Compact Objects*, July 2021.

[44] J. M. Miller. End to end modeling of a kilonova. In *348'th Meeting of the AAS*, June 2021.

[45] J. M. Miller. Neutrinos and nucleosynthesis in compact accretion flows. In *LANL/UA Days*, May 2020.

[46] J. M. Miller. Uncertainties in kilonova modeling. In *FRIB First Experiments*, May 2020.

[47] J. M. Miller. Neutrino tansport and absorption in kilonova modeling. In *LANL Friday Morning Astrophysics meeting*, September 2019.

[48] J. M. Miller. Neutrino tansport in compact disks. In *LANL Astrophysics Seminar*, September 2019.

[49] J. M. Miller, B. R. Ryan, and J. C. Dolence. Full transport model of gw170817-like disk produces a blue kilonova. In *Horizon 2019*, April 2019.

[50] J. M. Miller, B. R. Ryan, J. C. Dolence, C. Fryer, and A. Burrows. Black holes, neutrinos, neutrons, et al.: How the merger of two dead stars makes the heaviest elements in the universe, and how we know. In *Center for Nonlinear Studies Seminar*, February 2019.

[51] J. M. Miller. Emergent trends to simulate mma sources. In *Deep Learning for Multimessenger Astrophysics: Real-time Discovery at Scale*, October 2018.

[52] J. M. Miller, B. R. Ryan, J. C. Dolence, C. Fryer, and A. Burrows. Neutron star mergers and neutrino driven accretion flows. In *Astro Coffee at the Institute for Advanced Study, Princeton*, July 2018.

[53] J. M. Miller, J. Piotrowska, and E. Schnetter. Spectral methods in the presence of discontinuities. In *LANL EAP Colloquium*, 2018.

[54] J. M. Miller, J. Piotrowska, and E. Schnetter. Spectral methods in the presence of discontinuities. In *LANL Astrophysics Seminar*, 2018.

[55] J.M. Miller. Discontinuous Galerkin methods for relativistic astrophysics. In *Gravitational Astrophysics Group Meeting at NASA Goddard*, April 2017.

[56] J.M. Miller. Discontinuous Galerkin methods for relativistic astrophysics. In *LANL Astrophysics Seminar*, November 2016.

[57] N. de Brye, D. George, G. Hordemann, H. Lim, J. Loiseau, J. Miller, and J. Sharman. Domain partitioning and problem space representations for compact binary mergers. In *LANL CCS-7 Burrito Lunch*, August 2016.

[58] J. M. Miller. yt and simulationio. In *Einstein Toolkit Workshop 2016*, June 2016.

[59] J. M. Miller and E. Schnetter. Discontinuous Galerkin methods and numerical relativity. In *Special Seminar at NCSA*, May 2016.

[60] J. M. Miller. On the BSSN equations and their discretization. In *Perimeter Institute Strong Gravity Group Meeting*, March 2016.

[61] J. M. Miller and J. H. Cooperman. Spontaneous signature change in causal dynamical triangulations? In *Perimeter Institute Cosmology Group Meeting*, February 2016.

[62] J. M. Miller. Visualizing einstein toolkit data with yt. In *Einstein Toolkit Workshop 2015*, August 2015.

[63] J. M. Miller and E. Schnetter. Smooth is overrated: Generalizing discontinuous Galerkin methods for numerical relativity. In *Perimeter Institute Cosmology Group Meeting*, January 2015.

Selected Conference Proceedings

[64] J. M. Miller. Performance portability is (sort of) a lie. In *Salishan Conference for High-Speed Computing*, April 2023.

[65] J. M. Miller, B. R. Ryan, and J. C. Dolence. Full transport model of gw170817-like disk produces a blue kilonova. In *2019 DOE SciDAC PI's Meeting*, July 2019.

[66] J.M. Miller, J. Piotrowska, and E. Schnetter. Spectral methods in the presence of discontinuities. In *APS April Meeting*, April 2018. http://meetings.aps.org/Meeting/APR18/Session/B14.2.

Selected Outreach Articles

[67] R. Schroeder and J. M. Miller. Dark energy - best chance, worst prediction. *Tilting at the Universe*, April 2016. Online access at: https://soundcloud.com/tilting-at-the-universe/tatu-jonah-miller-dark-energy-best-chance-worst-prediction.

[68] J. M. Miller and A. G. Miller. The most important scientist in my life: My mom. *Stem Women*, January 2015. Online access at http://www.stemwomen.net/jonah-miller-scientist-mom/.

[69] J. M. Miller. Course review: Practical numerical methods with python. *Class Central*, 2015. Online access at https://www.class-central.com/report/gwu-numerical-mooc-review/.

[70] Z. Husain. Top 5 space photos of 2014 as chosen by space advocates. *Penny4NASA*, December 2014. Online access at: http://tinyurl.com/pyq86c3.

[71] Z. Husain. 17 amazing reasons why we should be excited about space! *Brown Space Man*, 2014. Online access at: http://tinyurl.com/owhvt66.

Published Fiction

[72] J. M. Miller. Yuki-onna. *One Title*, 2:125–144, 2012. *One Title* seems to have gone under. You can still find the story here: http://www.thephysicsmill.com/blog/wp-content/uploads/Yuki_Onna.pdf.