

CONTACT INFORMATION	285 Old Westport Rd, Dartmouth, MA, 02747.	Email: vijay.varma392@gmail.com Webpage: www.vijayvarma.com
RESEARCH INTERESTS	Gravitational Waves, Data-driven Modeling, and Numerical Relativity.	
EMPLOYMENT	Assistant Professor , Department of Mathematics, University of Massachusetts, Dartmouth (UMassD).	2023 – Present
	Marie Curie Fellow, Albert Einstein Institute (AEI), Potsdam.	2021 – 2023
	Klarman Fellow, Cornell University.	2020 – 2021
	Postdoctoral Scholar, California Institute of Technology.	2019 – 2020
EDUCATION	Ph.D. Physics California Institute of Technology, Pasadena, USA. Thesis: <i>Black hole simulations: from supercomputers to your laptop.</i> Advisors: Prof. Mark Scheel and Prof. Yanbei Chen.	2019
	M.Sc. Physics and B.E. Mechanical Engineering Birla Institute of Technology and Science, Pilani, India.	2014
PROFESSIONAL MEMBERSHIP	Simulating eXtreme Spacetimes (SXS) Collaboration. <ul style="list-style-type: none"> • Member of the executive committee. LIGO Virgo Kagra (LVK) Collaboration. <ul style="list-style-type: none"> • Co-chair of the Waveforms working group. 	
AWARDS/HONORS	<i>Brandenburg Postdoc Prize</i> , Ministry of Science, Research and Culture.	2022
	<i>Marie Curie Fellowship</i> , Albert Einstein Institute.	2021
	<i>Klarman Fellowship</i> , Cornell University.	2020
	Honorable mention in the GWIC-Braccini PhD Thesis Prize competition.	2020
	<i>Prabhat Award</i> for Best Outgoing Student in Physics, BITS, Pilani.	2013
PUBLICATION SUMMARY	<ul style="list-style-type: none"> • A total of 44 short-author papers, 14 as first-author. • Out of which, 6 covered by press releases. • 3 other publications (white papers, reviews, etc). • Selected publications (full list below). <ol style="list-style-type: none"> 1. Varma et al., <i>Physical Review Letters</i>, 128, 191102 (2022). 2. Varma et al., <i>Physical Review Letters</i>, 128, 031101 (2022). 3. Varma et al., <i>Physical Review Research</i>, 1, 033015 (2019). 4. Varma et al., <i>Physical Review Letters</i>, 122, 011101 (2019). 5. Varma et al., <i>Physical Review D</i>, 99, 064045 (2019). 	

MENTORSHIP

PhD students

- Swati Singh, UMassD. 2024-
- Abhishek Ravishankar, UMassD. 2023-
- Adhrit Ravichandran, UMassD. 2023-

Masters students

- Thanay Narayanamurthy, UMassD. Spring 2024
- Neeresh Perla, UMassD. Fall 2023
- Matteo Boschini, UMilano-Bicocca. Fall 2022

Undergraduate students

- Ryan Berry, UMassD. Summer 2024
- Afura Taylor, MIT. Summer 2019
- Jackie Lodman, Caltech. Summer 2019
- Hao Zhang, Peking University. Summer 2017

RESEARCH GRANTS

NSF research grant PHY-2309301, “Gravitational Wave Models for Black Hole - Neutron Stars in General Relativity and Beyond”, **V. Varma** (PI). \$180,000 (2023 - 2026).

Office of Naval Research grant for UMassD Marine and Undersea Technology Research Program, “Learning Nonlinear Dynamical Systems from Sparse and Noisy Data: Applications to Signal Detection and Recovery”, S. Field (PI), **V. Varma** (co-PI), Z. Chen (co-PI), A. Heryudono (co-PI), B. Keith (co-PI). \$438,284 (2022 - 2025).

COMPUTING GRANTS

Dutch Research Council supercomputer allocation grant 2024.002, “Simulations of spinning eccentric binary black hole mergers”, Antoni Ramos-Buades (PI), **V. Varma** (co-PI), Maria Haney (co-PI).

– 8,700,000 Cpu hours (2024 - 2026).

NSF ACCESS supercomputer allocation grant SEE230009, “Anvil for students enrolled in High Performance Scientific Computing taught at the University of Massachusetts Dartmouth”,

V. Varma (PI), S. Field (co-PI), A. Heryudono (co-PI).

– 160,000 Cpu hours (2023 - 2025).

NSF ACCESS supercomputer allocation grant PHY990002, “Gravitational Waves From Compact Binaries: Computational Contributions to LIGO”, S. Teukolsky (PI), **V. Varma** (co-PI), more SXS co-PIs.

– 25,000,000 Cpu hours (2023 - 2024).

– 20,000,000 Cpu hours (2022 - 2023).

– 15,000,000 Cpu hours (2021 - 2022).

Texas Advanced Computing Center (TACC) grant PHY20018, “Gravitational Waves from Compact Binaries: Computational Contributions to LIGO”, S. Teukolsky (PI), **V. Varma** (co-PI), more SXS co-PIs.

– 39,200,000 Cpu hours (2024 - 2025).

– 30,800,000 Cpu hours (2023 - 2024).

TEACHING

Instructor

- High Performance Scientific Computing, DSC 520. Fall 2023, Spring 2024, Fall 2024

Guest lecturer

- Special Topics in Physics (Gravitational Waves), PHY 510. Spring 2024
- Computational Physics, IMPRS, AEL. Spring 2022
- Gravitational Wave Astrophysics, University of Potsdam. Summer 2022

Teaching assistant

- Physics 1, Classical Mechanics and Electromagnetism, Caltech. 2014
- Physics 2, Waves, Quantum Mechanics, and Statistical Physics, Caltech. 2015
- Physics 106, Topics in Classical Physics, Caltech. 2015

SERVICE

Leadership

- Co-chair, LVK Waveforms working group. 2021–
- Executive committee member, SXS Collaboration. 2023–

Conferences and Workshops

- Organizer, Workshop “Scientific Machine Learning for Gravitational Wave Astronomy”, ICERM. June 2025
- Organizer, Workshop “Simulating Extreme Spacetimes with SpEC and SpECTRE”, incl. panel on “Careers in Industry”, ICERM. Aug 2024
- Organizer, Mini-Symposium “High Order Methods for Computational Relativity”, NAHOMCon, Dartmouth College. June 2024
- Scientific Organizing Committee, PAX Workshop, MIT. Aug 2022

Seminar series

- CSCDR Seminar, UMassD. 2024–
- Astrophysics Lunch Seminar, Cornell. 2020 – 2021

University service (UMassD)

- Co-Director, ACCOMPLISH STEM Scholarship Program. 2024–
- Data Science Steering Committee. 2024–
- Math Dept. Liaison to Biomedical Engr. and Biotechnology program. 2024–
- Webmaster, Mathematics department website. 2024–
- Webmaster, CSCDR website. 2024–

Thesis committees

- Bhaskar Verma, dissertation proposal, UMassD. 2024
- Som Bishoyi, dissertation proposal, UMassD. 2024
- Maite Mateu Lucena, PhD defense, University of the Balearic Islands. 2023

Journal referee

- *Physical Review D*
- *Physical Review Letters*
- *Astrophysical Journal Letters*
- *Classical and Quantum Gravity*
- *Nature Astronomy*
- *Scientific Reports - Nature*
- *Mathematical Reviews/MathSciNet - American Mathematical Society*

Grant referee/panelist

- STFC DiRAC
- NSF PHY
- NSF RCC
- NASA FINESST

Miscellaneous

- Panelist for the Faculty Positions Workshop, UMassD. May 2024

OUTREACH

Popular science lecture on *Smashing black holes together*, at the Osher Lifelong Learning Institute, URI, Sep 2024.

Brandenburg Postdoc Prize talk on *Catching runaway black holes*, Potsdam Museum, Potsdam, Nov 2022.

Popular science lecture on *The intricate dance of wobbling binary black holes*, during the November of Science, Hannover, Nov 2021.

Popular science article on *Ripples from colliding black holes*, for Caltech letters, March 2019.

Public talk on *Tumbling black holes*, for Astronomy on Tap, Pasadena, March 2019.

Developed the [binary black hole explorer](#), a teaching tool aimed at undergraduate and graduate students, to learn about precessing binary black hole mergers through visualizations, Nov 2018.

Invited speaker for BITS Embryo Lecture on *A career in Science*, Feb 2015.

IN THE NEWS

Paper coverage

- *First measurement of a large recoil.*
Varma, et al., *Physical Review Letters*, 128, 191102 (2022).
[APS](#), [New Scientist](#), [Discover Magazine](#), [Science News](#), [Indian Express](#), [Scientias](#), [Sciences et Avenir](#), [CNET](#), [Big Think](#), [Daily Express](#), [Antov Petrov](#).
- *Hints of spin-orbit resonances.*
Varma, et al., *Physical Review Letters*, 128, 031101 (2022).
[Cornell](#), [Ars Technica](#), [Universe Today](#).
- *Improved spin black hole measurements.*
Biscoveanu, et al., *Physical Review Letters*, 126, 171103 (2021).
[Cornell](#).
- *Method for measuring recoils kicks using LIGO.*
Varma, et al., *Physical Review Letters*, 124, 101104 (2020).
[Cornell](#), [Inside Science](#).
- *First surrogate model for extreme mass ratio inspirals.*
Rifat, et al., *Physical Review D*, 101, 081502 (R) (2020).
[Quanta magazine](#).
- *First surrogate model for black hole merger remnants.*
Varma, et al., *Physical Review Letters*, 122, 011101 (2019).
[Caltech](#), [OleMiss](#).

University highlights

- Coverage of the gravitational waves group at UMassD (2024).
- UMassD contributions to LISA science (2024).
- New insights on BBH properties from surrogate models, UMassD (2023).
- Brandenburg postdoc prize announcement, AEI (2022).
- Klarman Fellow profile, Cornell (2021)
- Cornell Daily Sun coverage of Klarman Fellows (2020).

Expert commentary

- Quoted in a popular science book, *The Gravity of Math: How Geometry Rules the Universe* (2024).
- Natal black hole kicks from supernovae, *Business Insider* (2024).
- Mass and angular momentum in general relativity, *Quanta Magazine* (2023).

Miscellaneous

- Anvil supercomputer science highlight on NR and surrogate models (2024).
- ACCESS and HPC Wire highlights on DSC 520 class at UMassD (2024).
- APS press conference on surrogate models and visualizations (2019).

SEMINARS AND INVITED TALKS

29. Gravity Seminar, Universitat de les Illes Balears, Palma, May 2023.
28. Gravity Seminar, Niels Bohr Institute, Copenhagen, May 2023.
27. Observational Relativity and Cosmology Seminar, AEI, Hannover, May 2023.
26. Physics and Astrophysics at the Extreme (PAX) Workshop, MIT, Aug 2022.
25. Astrophysics Seminar, University of Milano-Bicocca, June 2022.
24. Astrophysical and Planetary Sciences Lunch Seminar, CU Boulder, March 2022.
23. GW Next Meeting, Online, Jan 2022.
22. Computational Science Seminar, UMassD, Dec 2021.
21. IGFAE Seminar, USC, Santiago de Compostela, Oct 2021.
20. Astrophysical and Cosmological Relativity Seminar, AEI, Potsdam, Oct 2021.
19. Gravitational Wave Astronomy Group Seminar, Flatiron CCA, July 2021.
18. Gravitational Wave Astrophysics Conference, Hefei, June 2021.
17. Physics Seminar, IIT Madras, Apr 2021.
16. Physics Colloquium, HRI Allahabad, Dec 2020.
15. ICERM Workshop, Brown University, Nov 2020.
14. Lunch Seminar, Cornell, Ithaca, Sep 2020.
13. Strong Gravity Seminar, Perimeter Institute, Waterloo, Nov 2019.
12. Lunch Seminar, Cornell, Ithaca, Oct 2019.
11. GR Seminar, University of Jena, Jena, Oct 2019.
10. Astrophysical and Cosmological Relativity Seminar, AEI, Potsdam, Oct 2019.

9. Astrophysics Seminar, University of Birmingham, Birmingham, Oct 2019.
8. CaJAGWR Seminar, Caltech, Pasadena, Aug 2019.
7. GW-CMB Seminar, IUCAA, Pune, May 2019.
6. Physics Seminar, IISER, Pune, May 2019.
5. ICTS Seminar, Bangalore, May 2019.
4. Astrophysics Seminar, IISc, Bangalore, May 2019.
3. APS Press Conference, APS April meeting, Denver, April 2019.
2. LIGO Seminar, Caltech, Pasadena, Oct 2018.
1. Workshop on Reduced Order Modeling, AEI, Potsdam, June 2018.

CONFERENCE
CONTRIBUTIONS
AND ATTENDANCE

Contributed talks are indicated by a †.

37. MUST Research Program Technical Review Meeting, UMassD, July 2024.
36. Simulating Extreme Spacetimes with SpEC and SpECTRE (SXSCon), ICERM, Aug 2024.
35. High Order Methods for Computational Relativity (NAHOMCon), Dartmouth College, June 2024.
34. APS April meeting†, Sacramento, Apr 2024.
33. LIGO Virgo Kagra Collaboration Meeting, Baton Rouge, Mar 2024.
32. HPC Day, UMassD, Nov 2023.
31. Moriond Gravitation, La Thuile, Mar 2023.
30. LIGO Virgo Kagra Collaboration Meeting, Chicago, Mar 2023.
29. Gravitational Wave Physics and Astronomy Workshop, Melbourne, Dec 2022.
28. Fall 2020 Reunion Event, ICERM, Brown University, July 2022.
27. Gravitational Wave and Multimessenger Astronomy Workshop, Bad Honnef, Apr 2022.
26. LIGO Virgo Kagra Collaboration Meeting, Virtual, Mar 2022.
25. Black-Hole Ringdown Workshop, Flatiron CCA, Feb 2022.
24. Gravitational Wave Physics and Astronomy Workshop, Hannover, Dec 2021.
23. Kick Off Workshop of the Einstein Telescope Observational Science Board, Virtual, Sep 2021.
22. LIGO Virgo Kagra Collaboration Meeting, Virtual, Sep 2021.
21. Virtual APS April meeting†, April 2021.
20. Virtual APS April meeting†, April 2020.
19. GR22-Amaldi13†, Valencia, July 2019.
18. AstroInformatics†, Caltech, June 2019.

17. APS April meeting[†], Denver, April 2019.
16. LIGO Virgo Kagra Collaboration Meeting, Lake Geneva, March 2019.
15. LIGO Virgo Kagra Collaboration Meeting, Maastricht, Sep 2018.
14. APS April meeting[†], Columbus, April 2018.
13. APS April meeting[†], Columbus, April 2018 (On behalf of K. Barkett).
12. Pacific Coast Gravity Meeting[†], Caltech, Pasadena, March 2018.
11. Workshop on The Architecture of LISA Science Analysis: Imagining the Future, Caltech, Pasadena, January 2018.
10. Pacific Coast Gravity Meeting[†], UC Santa Barbara, March 2017.
9. APS April Meeting[†], Washington, DC, Jan 2017.
8. APS April Meeting[†], Salt Lake City, April 2016.
7. TASC Meeting[†], CSU Fullerton, Nov 2015.
6. Gravitational Wave Astrophysics School, Caltech, Pasadena, July 2015.
5. LIGO Virgo Kagra Collaboration Meeting, Pasadena, March 2015.
4. Gravitational Wave Physics and Astronomy Workshop, IUCAA, Pune, Dec 2013.
3. ICTS Summer School on Numerical Relativity, ICTS, Bangalore, June 2013.
2. BITS-IUCAA Workshop on Gravitational-Wave Data Analysis, Goa, Dec 2012.
1. Fifth International ASTROD Symposium on Laser Astrodynamics, Space Test of Relativity and Gravitational-Wave Astronomy, RRI, Bangalore, July 2012.

PUBLICATIONS

This list only includes short-author papers (peer-reviewed or under review); for the full list, see [INSPIRE](#).

44. L. Zertuche, L. Stein, K. Mitman, S. Field, **V. Varma**, M. Boyle, et al.
High-Precision Ringdown Surrogate Model for Non-Precessing Binary Black Holes.
Submitted to *Physical Review D*, [arxiv:2408.05300](#).
43. K. Rink, R. Bachhar, T. Islam, N. Rifat, K. Gonzalez-Quesada, S. Field, G. Khanna, S. Hughes, **V. Varma**.
Gravitational wave surrogate model for spinning, intermediate mass ratio binaries based on perturbation theory and numerical relativity.
Submitted to *Physical Review D*, [arxiv:2407.18319](#).
42. D. Sun, M. Boyle, K. Mitman, M. Scheel, L. Stein, S. Teukolsky, **V. Varma**.
Optimizing post-Newtonian parameters and fixing the BMS frame for numerical-relativity waveform hybridizations.
Submitted to *Physical Review D*, [arxiv:2403.10278](#).
41. H. Zhu, et al. (incl. **V. Varma**).
Black Hole Spectroscopy for Precessing Binary Black Hole Coalescences.
Submitted to *Physical Review Letters*, [arxiv:2312.08588](#).
40. S. Miller, M. Isi, K. Chatziioannou, **V. Varma**, I. Mandel.
GW190521: tracing imprints of spin-precession on the most massive black hole binary.
Physical Review D, 109, 024024 (2024), [arxiv:2310.01544](#).

39. T. Islam, A. Vajpeyi, F. Shaik, C. Haster, **V. Varma**, S. Field, et al.
Analysis of GWTC-3 with fully precessing numerical relativity surrogate models.
Submitted to *Physical Review D*, [arxiv:2309.14473](#).
38. M. Boschini, D. Gerosa, **V. Varma**, et al.
Extending black-hole remnant surrogate models to extreme mass ratios.
Physical Review D, 108, 084015 (2023), [arxiv:2307.03435](#).
37. J. Yoo, K. Mitman, **V. Varma**, et al.
Numerical relativity surrogate model with memory effects and post-Newtonian hybridization.
Physical Review D, 108, 064027 (2023), [arxiv:2306.03148](#).
36. M. Isi, W. Farr and **V. Varma**.
The directional isotropy of LIGO-Virgo binaries.
Astrophysical Journal, 962, 19 (2024), [arxiv:2304.13254](#).
35. S. Ma, **V. Varma**, L. Stein, F. Foucart, et al.
Numerical simulations of black hole-neutron star mergers in scalar-tensor gravity.
Physical Review D, 107, 124051 (2023), [arxiv:2304.11836](#).
34. A. Shaikh, **V. Varma**, H. Pfeiffer, A. Ramos-Buades and M. van de Meent.
Defining eccentricity for gravitational wave astronomy.
Physical Review D, 108, 104007 (2023), [arxiv:2302.11257](#).
33. M. Walker, **V. Varma**, G. Lovelace, and M. Scheel.
Numerical-relativity surrogate modeling with nearly extremal black-hole spins.
Classical and Quantum Gravity, 40, 055003 (2023), [arxiv:2208.02927](#).
32. T. Islam, S. Field, S. Hughes, G. Khanna, **V. Varma**, M. Giesler, M. Scheel, L. Kidder, and H. Pfeiffer.
Surrogate model for gravitational wave signals from non-spinning, comparable- to large-mass-ratio black hole binaries built on black hole perturbation theory waveforms calibrated to numerical relativity.
Physical Review D, 106, 104025 (2022), [arxiv:2204.01972](#).
[Editors' Suggestion](#).
31. J. Yoo, **V. Varma**, M. Giesler, M. Scheel, C. Haster, et al.
Targeted large mass ratio numerical relativity surrogate waveform model for GW190814.
Physical Review D, 106, 044001 (2022), [arxiv:2203.10109](#).
30. B. Gadre, M. Pürrer, S. Field, S. Ossokine, and **V. Varma**.
A fully precessing higher-mode surrogate model of effective-one-body waveforms.
Submitted to *Physical Review D*, [arxiv:2203.00381](#).
29. **V. Varma**, S. Biscoveanu, T. Islam, F. Shaik, C. Haster, M. Isi, et al.
Evidence of large recoil velocity from a black hole merger signal.
Physical Review Letters, 128, 191102 (2022), [arxiv:2201.01302](#).
[Editors' Suggestion and Featured in Physics.](#)
In press: [New Scientist](#), [Discover Magazine](#), [Science News](#), [Indian Express](#), [Scientias](#), [Sciences et Avenir](#), [CNET](#), [Big Think](#), [Daily Express](#).
28. **V. Varma**, S. Biscoveanu, M. Isi, W. Farr, and S. Vitale.
Hints of spin-orbit resonances in the binary black hole population.
Physical Review Letters, 128, 031101 (2022), [arxiv:2107.09693](#).
In press: [Cornell](#), [Ars Technica](#), [Universe Today](#).

27. **V. Varma**, M. Isi, S. Biscoveanu, W. Farr, and S. Vitale.
Measuring binary black hole orbital-plane spin orientations.
Physical Review D, 105, 024045 (2022), [arxiv:2107.09692](#).
26. S. Biscoveanu, M. Isi, **V. Varma**, and S. Vitale.
Measuring the spins of heavy binary black holes.
Physical Review D, 104, 103018 (2021), [arxiv:2106.06492](#).
25. S. Ma, M. Giesler, **V. Varma**, M. Scheel, and Y. Chen.
Universal features of gravitational waves emitted by superkick binary black hole systems.
Physical Review D, 104, 084003 (2021), [arxiv:2107.04890](#).
24. S. Biscoveanu, M. Isi, S. Vitale, and **V. Varma**.
A new spin on LIGO-Virgo binary black holes.
Physical Review Letters, 126, 171103 (2021), [arxiv:2007.09156](#).
In press: Cornell.
23. S. Ma, M. Giesler, M. Scheel, and **V. Varma**.
Extending superposed harmonic initial data to higher spin.
Physical Review D, 103, 084029 (2021), [arxiv:2102.06618](#).
22. Y. Huang, C. Haster, S. Vitale, **V. Varma**, F. Foucart, and S. Biscoveanu.
Statistical and systematic uncertainties in extracting the source properties of neutron star - black hole binaries with gravitational waves.
Physical Review D, 103, 083001 (2021), [arxiv:2005.11850](#).
21. T. Islam, **V. Varma**, J. Lodman, S. Field, G. Khanna, et al.
Eccentric binary black hole surrogate models for the gravitational waveform and remnant properties: comparable mass, nonspinning case.
Physical Review D, 103, 064022 (2021), [arxiv:2101.11798](#).
20. **V. Varma**, M. Mould, D. Gerosa, M. Scheel, L. Kidder, and H. Pfeiffer.
Up-down instability of binary black holes in numerical relativity.
Physical Review D, 103, 064003 (2021), [arxiv:2012.07147](#).
19. A. Taylor and **V. Varma**.
Gravitational wave peak luminosity model for precessing binary black holes.
Physical Review D, 102, 104047 (2020), [arxiv:2010.00120](#).
18. L. Reali, M. Mould, D. Gerosa, and **V. Varma**.
Mapping the asymptotic inspiral of precessing binary black holes to their merger remnants.
Classical and Quantum Gravity, 37, 225005 (2020), [arxiv:2005.01747](#).
17. **V. Varma**, M. Isi, and S. Biscoveanu.
Extracting the gravitational recoil from black hole merger signals.
Physical Review Letters, 124, 101104 (2020), [arxiv:2002.00296](#).
In press: Cornell, Inside Science.
16. K. Barkett, Y. Chen, M. Scheel, and **V. Varma**.
Gravitational waveforms of binary neutron star inspirals using PN Tidal Splicing.
Physical Review D, 102, 024031 (2020), [arxiv:1911.10440](#).
15. F. Shaik, J. Lange, S. Field, R. O'Shaughnessy, **V. Varma**, L. Kidder, H. Pfeiffer, and D. Wysocki.
Impact of subdominant modes on the interpretation of gravitational-wave signals from heavy binary black hole systems.
Physical Review D, 101, 124054 (2020), [arxiv:1911.02693](#).

14. N. Rifat, S. Field, G. Khanna, and **V. Varma**.
A Surrogate Model for Gravitational Wave Signals from Comparable- to Large-Mass-Ratio Black Hole Binaries.
Physical Review D, 101, 081502 (R) (2020), [arxiv:1910.10473](#).
In press: Quanta magazine.
13. T. Islam, A. Mehta, A. Ghosh, **V. Varma**, P. Ajith, and B. Sathyaprakash.
Testing the “no-hair” nature of binary black holes using the consistency of multipolar gravitational radiation.
Physical Review D, 101, 024032 (2020), [arxiv:1910.14259](#).
12. **V. Varma**, S. Field, M. Scheel, J. Blackman, et al.
Surrogate models for precessing binary black hole simulations with unequal masses.
Physical Review Research, 1, 033015 (2019), [arxiv:1905.09300](#).
11. M. Boyle, et al. (incl. **V. Varma**).
The SXS Collaboration catalog of binary black hole simulations.
Classical and Quantum Gravity, 36, 195006 (2019), [arxiv:1904.04831](#).
10. A. Mehta, P. Tiwari, N. J. McDaniel, C. Mishra, **V. Varma**, and P. Ajith.
Including mode mixing in a higher-multipole model for gravitational waveforms from nonspinning black-hole binaries.
Physical Review D, 100, 024032 (2019), [arxiv:1902.02731](#).
9. **V. Varma**, S. Field, M. Scheel, J. Blackman, L. Kidder, and H. Pfeiffer.
Surrogate model of hybridized numerical relativity binary black hole waveforms.
Physical Review D, 99, 064045 (2019), [arxiv:1812.07865](#).
8. **V. Varma**, L. Stein, and D. Gerosa.
The binary black hole explorer: on-the-fly visualizations of precessing binary black holes.
Classical and Quantum Gravity, 36, 095007 (2019), [arxiv:1811.06552](#).
7. **V. Varma**, D. Gerosa, L. Stein, F. Hebert, and H. Zhang.
High-accuracy mass, spin, and recoil predictions of generic black-hole merger remnants.
Physical Review Letters, 122, 011101 (2019), [arxiv:1809.09125](#).
In press: Caltech, OleMiss.
6. **V. Varma**, M. Scheel, and H. Pfeiffer.
Comparison of binary black hole initial data sets.
Physical Review D, 98, 104011 (2018), [arxiv:1808.08228](#).
5. **V. Varma** and M. Scheel.
Constructing a boosted, spinning black hole in the damped harmonic gauge.
Physical Review D, 98, 084032 (2018), [arxiv:1808.07490](#).
4. A. Mehta, C. Mishra, **V. Varma**, and P. Ajith.
Accurate inspiral-merger-ringdown gravitational waveforms for non-spinning black-hole binaries including the effect of subdominant modes.
Physical Review D, 96, 124010 (2017), [arxiv:1708.03501](#).
3. **V. Varma** and P. Ajith.
Effects of nonquadrupole modes in the detection and parameter estimation of black hole binaries with nonprecessing spins.
Physical Review D, 96, 124024 (2017), [arxiv:1612.05608](#).

2. **V. Varma**, P. Ajith, S. Husa, J. Bustillo, M. Hannam, and M. Pürrer.
Gravitational-wave observations of binary black holes: Effect of nonquadrupole modes.
Physical Review D, 90, 124004 (2014), [arxiv:1409.2349](#).
1. **V. Varma**, R. Fujita, A. Choudhary, and B. Iyer.
Comparison of post-Newtonian templates for extreme mass ratio inspirals.
Physical Review D, 88, 024038 (2013), [arxiv:1304.5675](#).
3. V. Kalogera, et al. (incl. **V. Varma**).
The Next Generation Global Gravitational Wave Observatory: The Science Book.
[arxiv:2111.06990](#).
2. E. Barausse, et al. (incl. **V. Varma**).
Prospects for Fundamental Physics with LISA.
[arxiv:2001.09793](#).
1. B. Sathyaprakash, et al. (incl. **V. Varma**).
Extreme gravity and fundamental physics.
[arxiv:1903.09221](#).

UNREFEREED
PAPERS

COMPUTING
SKILLS

Languages: Expert in Python. Proficient in C/C++, Mathematica and MATLAB.

Operating systems: Mac OS, Linux/*nix. Experience with working on high performance supercomputers.

Contributions: Most contributions can be found at github.com/vijayvarma392.

- Developer and maintainer of PyPI packages [surfinBH](#), [binaryBHexp](#), [gwsurrogate](#), and [gw_eccentricity](#).
- Member of the Simulating eXtreme Spacetimes (SXS) collaboration, contributor to the Spectral Einstein Code ([SpEC](#)).
- Member of the LIGO scientific collaboration, contributor to the LIGO Algorithm Library - [LALSuite](#).