Tejaswi Venumadhav Nerella — Curriculum Vitae

Assistant Professor, Department of Physics
Broida Hall
University of California, Santa Barbara
Santa Barbara, CA 93106-9530

Contact:
Phone: (626) 826-3571
email: teja@ucsb.edu

Education

California Institute of technology 2010-2015
Ph.D. in Physics,
Advisor: Christopher Hirata

Indian Institute of Technology, Kanpur 2005-2010
M.Sc (Integrated) in Physics

Academic Honors

Sloan Research Fellowship 2023
Alfred P. Sloan Foundation

John Bahcall Fellowship 2019
Institute for Advanced Study

Schmidt Fellowship 2015 - 2018
Institute for Advanced Study

Robert A. Millikan Fellowship 2010
California Institute of Technology

International Fulbright Science and Technology Award 2010
Bureau of Education and Cultural Affairs, U.S. Department of State

President's Gold Medal for the best academic performance in the graduating class in all disciplines, IIT Kanpur 2010

General Proficiency Medal for the best academic performance in the graduating class in Physics, IIT Kanpur 2010

Summer Undergraduate Research Fellowship 2007, 2008
California Institute of Technology

Academic Excellence Award 2007, 2008, 2009, 2010
IIT Kanpur

Silver Medal, 36th International Physics Olympiad 2005

KVPY Fellowship 2004
Department of Science and Technology, Govt. of India

NTSE Fellowship 2003
National Council of Educational Research and Training, Govt. of India

Work Experience

Assistant Professor Jul 2020-present
University of California, Santa Barbara

Visiting Professor 2020-present
International Center for Theoretical Sciences, Bangalore

Member Sep 2015-Jul 2020
Institute for Advanced Study, Princeton

Associate 2019-2020
International Center for Theoretical Sciences, Bangalore

Graduate Student Sep 2010-Aug 2015
California Institute of Technology, Pasadena
Advisor: Christopher M. Hirata

Visiting Scientist May-August 2009
Max-Planck-Institut für Physik komplexer Systeme, Dresden
Advisor: Roderich Moessner

Summer Undergraduate Research Fellow May-August 2008
California Institute of Technology, Pasadena
Advisor: Re'em Sari

Summer Undergraduate Research Fellow May-August 2007
California Institute of Technology, Pasadena
Advisor: Andrew Lange

Refereed publications

1. Yu, H., Weinberg, N., Arras, P., Kwon, J., **Venumadhav, T.**, (2022), Mon. Not. R. Astron. Soc., 519, 4325
   Title: Beyond the linear tide: impact of the nonlinear tidal response of neutron stars on gravitational waveforms for binary inspirals
2. Roulet, J., Olsen, S., Mushkin, J., Islam, T., **Venumadhav, T.**, Zackay, B., Zaldarriaga, M., (2022), Physical Review D, 106, 123015
   Title: Removing degeneracy and multimodality in gravitational wave source parameters
3. Olsen, S., **Venumadhav, T.**, Mushkin, J., Roulet, J., Zackay, B., Zaldarriaga, M., (2022), Physical Review D, 106, 043009
   Title: New binary black hole mergers in the LIGO–Virgo O3a data
4. Olsen, S., Roulet, J., Chia, H.S., Dai, L., **Venumadhav, T.**, Zackay, B., Zaldarriaga, M., (2021), Physical Review D, 104, 083036
   Title: Mapping the Likelihood of GW190521 with Diverse Mass and Spin Priors
5. Roulet, J., Chia, H.S., Olsen, S., Dai, L., **Venumadhav, T.**, Zackay, B., Zaldarriaga, M., (2021), Physical Review D, 104, 083010
   Title: Distribution of Effective Spins and Masses of Binary Black Holes from the LIGO and Virgo O1-O3a Observing Runs
6. Chia, H.S., Olsen, S., Roulet, J., Dai, L., **Venumadhav, T.**, Zackay, B., Zaldarriaga, M., (2021), Physical Review D, 106, 024009
   Title: Signs of Higher Multipoles and Orbital Precession in GW151226

7. Roulet, J., **Venumadhav, T.**, Zackay, B., Dai, L., Zaldarriaga, M., (2020), Physical Review D, 102, 123022
   Title: Binary Black Hole Mergers from LIGO/Virgo O1 and O2: Population Inference Combining Confident and Marginal Events

8. Huang, Y., Haster, C-J., Roulet, J., Vitale, S., Zimmerman, A., **Venumadhav, T.**, Zackay, B., Dai, L., Zaldarriaga, M., (2020), Physical Review D, 102, 103024
   Title: Source properties of the lowest signal-to-noise-ratio binary black hole detections

9. Zackay, B., **Venumadhav, T.**, Roulet, J., Dai, L., Zaldarriaga, M., (2019), Physical Review D, 104, 063034
   Title: Detecting Gravitational Waves in Data with Non-Gaussian Noise

10. Zackay, B., Dai, L., **Venumadhav, T.**, Roulet, J., Zaldarriaga, M., (2019), Physical Review D, 104, 063030
    Title: Detecting Gravitational Waves With Disparate Detector Responses: Two New Binary Black Hole Mergers

11. **Venumadhav, T.**, Zackay, B., Roulet, J., Dai, L., Zaldarriaga, M., (2019), Physical Review D, 101, 083030
    Title: New Binary Black Hole Mergers in the Second Observing Run of Advanced LIGO and Advanced Virgo

12. Samsing, J., **Venumadhav, T.**, Dai, L., Martinez, I., Batta, A., Lopez Jr., M., Ramirez-Ruiz, E., Kremer, K., (2019), Physical Review D, 100, 043009
    Title: Probing the Black Hole Merger History in Clusters using Stellar Tidal Disruptions

13. **Venumadhav, T.**, Zackay, B., Roulet, J., Dai, L., Zaldarriaga, M., (2019), Physical Review D, 100, 023011
    Title: A New Search Pipeline for Compact Binary Mergers: Results for Binary Black Holes in the First Observing Run of Advanced LIGO

14. Zackay, B., **Venumadhav, T.**, Dai, L., Roulet, J., Zaldarriaga, M., (2019), Physical Review D, 100, 023007 (Editor's suggestion)
    Title: Highly Spinning and Aligned Binary Black Hole Merger in the Advanced LIGO First Observing Run

15. Roulet, J., Dai, L., **Venumadhav, T.**, Zackay, B., Zaldarriaga, M., (2019), Physical Review D, 99, 123022
    Title: Template Bank for Compact Binary Coalescence Searches in Gravitational Wave Data: A General Geometric Placement Algorithm

16. Kaurov, A., Dai, L., **Venumadhav, T.**, Miralda-Escudé, J., Frye, B., (2019), Astrophysical Journal, 880, 1
    Title: Highly Magnified Stars in Lensing Clusters: New Evidence in a Galaxy Lensed by MACS J0416.1-2403

17. **Venumadhav, T.**, Dai, L., Kaurov, A., Zaldarriaga, M., (2018), Physical Review D, 98, 103513 (Editor's suggestion)
    Title: Heating of the intergalactic medium by the cosmic microwave background during cosmic dawn

18. Kaurov, A., **Venumadhav, T.**, Dai, L., Zaldarriaga, M., (2018), Astrophys. J. Lett., 864, 1
    Title: Implication of the Shape of the EDGES Signal for the 21 cm Power Spectrum

19. Dai, L., **Venumadhav, T.**, Kaurov, A., Miralda-Escudé, J., (2018), Astrophysical Journal, 867, 24
    Title: Probing Dark Matter Subhalos in Galaxy Clusters Using Highly Magnified Stars

20. Hirata, C. M., Mishra, A., **Venumadhav, T.**, (2017), Physical Review D, 97, 103521
Title: Detecting primordial gravitational waves with circular polarization of the redshifted 21 cm line: I. Formalism

21. **Venumadhav, T.**, Dai, L., Miralda-Escudé, J., (2017), Astrophysical Journal, 850, 49
Title: Microlensing of extremely magnified stars near caustics of galaxy clusters

22. Gluscevic, V., **Venumadhav, T.**, Fang, X., Hirata, C. M., Oklopčić, A., Mishra, A. (2017), Physical Review D, 95, 083011
Title: A new probe of magnetic fields in the pre-reionization epoch: II. Detectability

23. **Venumadhav, T.**, Oklopčić, A., Gluscevic, V., Mishra, A., & Hirata, C. M. (2017), Physical Review D, 95, 083010
Title: A new probe of magnetic fields in the pre-reionization epoch: I. Formalism

24. Dai, L., **Venumadhav, T.**, Sigurdson, K. (2017), Physical Review D, 95, 044011
Title: The effect of lensing magnification on the apparent distribution of black hole mergers

25. **Venumadhav, T.**, Cyr-Racine, F.-Y., Abazajian, K. N., & Hirata, C. M. (2016), Physical Review D, 94, 043515
Title: Sterile neutrino dark matter: A tale of weak interactions in the strong coupling epoch

26. **Venumadhav, T.**, Chang, T.-C., Doré, O., & Hirata, C. M. (2015), Astrophysical Journal, 826, 116
Title: A practical theorem on using interferometry to measure the global 21 cm signal

27. **Venumadhav, T.**, & Hirata, C. M. (2015), Physical Review D, 91, 123009
Title: Stability of small-scale baryon perturbations during cosmological recombination

28. **Venumadhav, T.**, Zimmerman, A., & Hirata, C. M. (2014), Astrophysical Journal, 781, 23
Title: The stability of tidally deformed neutron stars to three- and four-mode coupling

29. **Venumadhav, T.**, Haque, M., & Moessner, R. (2010), Physical Review B, 81, 054305
Title: Finite-rate quenches of site bias in the Bose-Hubbard dimer

Preprints on the arxiv

1. Islam, T., Roulet, J., **Venumadhav, T.**, (2022), arXiv:2210.16278
Title: Factorized Parameter Estimation for Real-Time Gravitational Wave Inference

2. Dai, L., Zackay, B., **Venumadhav, T.**, Roulet, J., Zaldarriaga, M., (2019), arXiv:2007.12709
Title: Search for Lensed Gravitational Waves Including Morse Phase Information: An Intriguing Candidate in O2

3. Coleman, M., **Venumadhav, T.**, Zackay, B.,, (2019), arXiv:1903.04978
Title: Gravitational-wave-moderated Accretion: The Case of ES Ceti

4. Haris, K., Mehta, A. K., Kumar, S., **Venumadhav, T.**, Parameswaran, A. (2018), arXiv:1807.07062
Title: Identifying strongly lensed gravitational wave signals from binary black hole mergers

5. Zackay, B., Dai, L., **Venumadhav, T.**, (2018), arXiv:1806.08792
Title: Relative Binning and Fast Likelihood Evaluation for Gravitational Wave Parameter Estimation

6. Dai, L., **Venumadhav, T.**, Zackay, B., (2018), arXiv:1806.08793
Title: Parameter Estimation for GW170817 using Relative Binning

7. Dai, L., **Venumadhav, T.**, (2017), arXiv:1702.04724
Title: On the waveforms of gravitationally lensed gravitational waves

n^{th} author papers

1. Raaijmakers, G., et. al., (2021), Astrophysical Journal, 922, 269
   Title: The Challenges Ahead for Multimessenger Analyses of Gravitational Waves and Kilonova: A Case Study on GW190425

2. Dai, L., et. al., (2020), Mon. Not. R. Astron. Soc., 495, 3192
   Title: Asymmetric Surface Brightness Structure of Lensed Arc in SDSS J1226+2152: A Case for Dark Matter Substructure

3. Bull, P., et. al., (2018), Publ. Astron. Soc. Aust., 37, 002
   Title: Fundamental Physics with the Square Kilometer Array

4. Doré, O., et. al., (2014), arXiv:1412.4872
   Title: Cosmology with the SPHEREX All-Sky Spectral Survey

Professional Service

- Referee for Astroparticle Physics
- Referee for the Astrophysical Journal
- Referee for Monthly Notices of the Royal Astronomical Society Letters
- Referee for Monthly Notices of the Royal Astronomical Society
- Referee for Physical Review D

Talks and presentations

1. Invited talk, Gravitational Wave Physics and Astronomy Workshop, Melbourne. 2022
2. Invited Astrophysics seminar, International Center for Theoretical Sciences, Bangalore. 2022
3. Invited Astrophysics seminar, Raman Research Institute, Bangalore. 2022
4. Invited Astrophysics seminar, Indian Institute of Science, Bangalore. 2022
5. Invited talk at the ISSI (International Space Science Institute) Workshop on Strong Gravitational Lensing (virtual). 2022
6. Invited talk at the SRITP workshop on "EM counterparts to GW sources" at the Weizmann Institute, Rehovot. 2022
7. Invited talk at the KITP conference titled "Storming the Gravitational Wave Frontier". 2022
8. Invited Panelist at the APS April Meeting on the panel Data Analysis in Astrophysics (virtual). 2021
9. Invited Astrophysics Colloquium, Massachusetts Institute of Technology. 2020
10. Invited Cosmology seminar (virtual), CERN. 2020
11. Invited Seminar, CITA, Toronto. 2020
12. Invited Talk, Gravitational wave searches and parameter estimation in the era of detections, Schloss Ringberg. 2020
13. Invited Seminar, Indian Institute of Technology, Mumbai. 2020
14. Invited Seminar, Tata Institute of Fundamental Research, Mumbai. 2019
15. Invited Talk, Frank N. Bash Symposium, UT Austin. 2019
16. Talk, Gravitational Wave Physics and Astronomy Workshop, Tokyo. 2019

17. Invited Talk, Black Holes and Neutron Stars with Gravitational Waves, YITP, Kyoto. 2019
18. Invited Colloquium, Black Hole Initiative, Harvard. 2019
19. Invited panelist, The Future of Gravitational-Wave Astronomy, Bangalore. 2019
20. Invited Seminar, International Centre for Theoretical Sciences, TIFR. 2019
21. Invited Seminar, Princeton Gravity Initiative, Princeton. 2019
22. Invited Seminar, Albert Einstein Institute, Potsdam. 2019
23. Invited Seminar, Center for Cosmology and Particle Physics, NYU. 2019
24. Invited Seminar, Astronomy and Astrophysics, UC Santa Barbara. 2019
25. Invited Colloquium, Department of Physics, UC Santa Barbara. 2019
26. Invited panelist, Physics and Astrophysics at the eXtreme, IUCAA, Pune. 2018
27. Invited talk, Thermal history of the Universe at intermediate redshift: progress with 21cm absorption measurements, CERN. 2018
28. Talk, Shedding Light on the Dark Universe with Extremely Large Telescopes, UCLA. 2018
29. Invited Cosmology seminar, JHU, Baltimore. 2017
30. Invited Seminar, CITA, Toronto. 2017
31. Talk, Fundamental Physics with the Square Kilometer Array, Mauritius. 2017
32. Invited talk, Tianlai Collaboration Meeting, Fermilab, Batavia. 2016
33. Invited talk, CMB Spectral Distortions From Cosmic Baryon Evolution, RRI, Bengaluru. 2016
34. Invited seminar, International Centre for Theoretical Sciences, TIFR. 2016
35. Invited cosmology seminar, Perimeter institute. 2016
36. Cosmology lunch, joint w/ IAS and Princeton University. 2016
37. Astrophysics informal seminar, IAS. 2016
38. Seminar, Inter University Center for Astronomy and Astrophysics, Pune. 2015
39. Seminar, National Center for Radio Astronomy, Pune. 2015
40. Talk, The Primordial Universe after Planck, IAP, Paris. 2014
41. Seminar, McGill University, Montreal. 2014
42. Seminar, CITA, Toronto. 2014
43. ITC Seminar, Harvard University, Boston. 2014
44. Cosmology lunch, joint w/ IAS and Princeton University. 2014
45. Talk, Theoretical Astrophysics in Southern California (TASC), UCSD, San Diego. 2014
46. Special seminar, KICP, University of Chicago. 2014
47. Cosmology Lunch talk, CCAPP, Ohio State University, Columbus. 2014
48. Poster, Gravitational Wave Physics and Astronomy Workshop (GWPAW) at IUCAA, Pune. 2013

49. Seminar, Inter University Center for Astronomy and Astrophysics, Pune. 2013

50. Talk, Theoretical Astrophysics in Southern California (TASC), Carnegie Observatories, Pasadena. 2012

51. Poster, Summer school on cosmology, ICTP, Trieste. 2012

References

Christopher M. Hirata
The Ohio State University
191 West Woodruff Lane
Columbus, OH 43210, USA
email: hirata.10@osu.edu

Jordi Miralda Escudé
Institut de Cincies del Cosmos
Universitat de Barcelona
08028 Barcelona Catalonia, Spain
email: miralda@icc.ub.edu

Kevork N. Abazajian
University of California, Irvine
Department of Physics and Astronomy
2186 Frederick Reines Hall
Irvine, CA 92697, USA
email: kevork@uci.edu

Matias Zaldarriaga
Institute for Advanced Study
1 Einstein Drive
Princeton, NJ 08540, USA
email: matiasz@ias.edu

Olivier Doré
Jet Propulsion Laboratory
M/S 169-327
4800 Oak Grove Drive
Pasadena, CA 91109, USA
email: olivier.p.dore@jpl.nasa.gov