

Tejaswi Venumadhav Nerella

Curriculum Vitae

Member, School of Natural Sciences
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Institute for Advanced Study
Princeton, NJ 08540

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Education

California Institute of technology Ph.D. in Physics, <i>Advisor:</i> Christopher Hirata	2010-2015
Indian Institute of Technology, Kanpur M.Sc (Integrated) in Physics	2005-2010

Academic Honors

John Bahcall Fellowship Institute for Advanced Study	2019 - present
Schmidt Fellowship Institute for Advanced Study	2015 - 2018
Robert A. Millikan Fellowship California Institute of Technology	2010
International Fulbright Science and Technology Award Bureau of Education and Cultural Affairs, U.S. Department of State	2010
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 California Institute of Technology	2007, 2008
Academic Excellence Award IIT Kanpur	2007, 2008, 2009, 2010
Silver Medal, 36th International Physics Olympiad	2005
KVPY Fellowship Department of Science and Technology, Govt. of India	2004
NTSE Fellowship National Council of Educational Research and Training, Govt. of India	2003

Work Experience

Member Institute for Advanced Study, Princeton	Sep 2015-Present
Associate International Center for Theoretical Sciences, Bangalore	2019-Present
Graduate Student California Institute of Technology, Pasadena <i>Advisor:</i> Christopher M. Hirata	Sep 2010-Aug 2015
Visiting Scientist Max-Planck-Institut für Physik komplexer Systeme, Dresden <i>Advisor:</i> Roderich Moessner	May-August 2009
Summer Undergraduate Research Fellow California Institute of Technology, Pasadena <i>Advisor:</i> Re'em Sari	May-August 2008
Summer Undergraduate Research Fellow California Institute of Technology, Pasadena <i>Advisor:</i> Andrew Lange	May-August 2007

Refereed publications

1. **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
2. 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
3. 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
4. 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
5. **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
6. 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

7. 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
8. 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
9. **Venumadhav, T.**, Dai, L., Miralda-Escudé, J., (2017), *Astrophysical Journal*, 850, 49
Title: Microlensing of extremely magnified stars near caustics of galaxy clusters
10. 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
11. **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
12. 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
13. **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
14. **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
15. **Venumadhav, T.**, & Hirata, C. M. (2015), *Physical Review D*, 91, 123009
Title: Stability of small-scale baryon perturbations during cosmological recombination
16. **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
17. **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. Zackay, B., **Venumadhav, T.**, Roulet, J., Dai, L., Zaldarriaga, M., (2019), arXiv:1908.05644
Title: Detecting Gravitational Waves in Data with Non-Gaussian Noise
2. **Venumadhav, T.**, Zackay, B., Roulet, J., Dai, L., Zaldarriaga, M., (2019), arXiv:1904.07214
Title: New Binary Black Hole Mergers in the Second Observing Run of Advanced LIGO and Advanced Virgo
3. Coleman, M., **Venumadhav, T.**, Zackay, B., (2019), arXiv:1903.04978
Title: Gravitational-wave-moderated Accretion: The Case of ES Ceti
4. Samsing, J., **Venumadhav, T.**, Dai, L., Martinez, I., Batta, A., Lopez Jr., M., Ramirez-Ruiz, E., Kremer, K., (2019), arXiv:1901.02889
Title: Probing the black hole merger history in clusters using stellar tidal disruptions
5. 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
6. Zackay, B., Dai, L., **Venumadhav, T.**, (2018), arXiv:1806.08792
Title: Relative Binning and Fast Likelihood Evaluation for Gravitational Wave Parameter Estimation

7. Dai, L., **Venumadhav, T.**, Zackay, B., (2018), arXiv:1806.08793
Title: Parameter Estimation for GW170817 using Relative Binning
8. Dai, L., **Venumadhav, T.**, (2017), arXiv:1702.04724
Title: On the waveforms of gravitationally lensed gravitational waves

n^{th} author papers

1. Doré, O., et. al., (2014), arXiv:1412.4872
Title: Cosmology with the SPHEREX All-Sky Spectral Survey
2. Bull, P., et. al., (2018), arXiv:1810.02680
Title: Fundamental Physics with the Square Kilometer Array

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

Other work

- Probing Primordial Magnetic Fields with 21-cm Line Observations of the High-redshift Intergalactic Medium
Oklopčić, A., Gluscevic, V., Hirata, C.M., Mishra, A., **Venumadhav, T.** (2014)
AAS presentation by Oklopčić, A.
- Spin-orbit resonances for satellites on highly eccentric orbits, SURF (2008)
Mentors: Re'em Sari and Daniel Babich
Report at http://www.its.caltech.edu/~tnerella/draft_v7.pdf
- Waveplate modeling, SURF (2007)
Mentor: Andrew Lange
Report at http://www.its.caltech.edu/~tnerella/waveplate_07.pdf

Talks and presentations

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| 1. Talk, Gravitational Wave Physics and Astronomy Workshop, Tokyo. | 2019 |
| 2. Invited Talk, Black Holes and Neutron Stars with Gravitational Waves, YITP, Kyoto. | 2019 |
| 3. Invited Colloquium, Black Hole Initiative, Harvard.. | 2019 |
| 4. Invited panelist, The Future of Gravitational-Wave Astronomy, Bangalore. | 2019 |
| 5. Invited Seminar, International Centre for Theoretical Sciences, TIFR. | 2019 |
| 6. Invited Seminar, Princeton Gravity Initiative, Princeton. | 2019 |
| 7. Invited Seminar, Albert Einstein Institute, Potsdam. | 2019 |
| 8. Invited Seminar, Center for Cosmology and Particle Physics, NYU. | 2019 |

9. Invited Seminar, Astronomy and Astrophysics, UC Santa Barbara.	2019
10. Invited Colloquium, Department of Physics, UC Santa Barbara.	2019
11. Invited panelist, Physics and Astrophysics at the eXtreme, IUCAA, Pune.	2018
12. Invited talk, Thermal history of the Universe at intermediate redshift: progress with 21cm absorption measurements, CERN.	2018
13. Talk, Shedding Light on the Dark Universe with Extremely Large Telescopes, UCLA.	2018
14. Invited Cosmology seminar, JHU, Baltimore.	2017
15. Invited Seminar, CITA, Toronto.	2017
16. Talk, Fundamental Physics with the Square Kilometer Array, Mauritius.	2017
17. Invited talk, Tianlai Collaboration Meeting, Fermilab, Batavia.	2016
18. Invited talk, CMB Spectral Distortions From Cosmic Baryon Evolution, RRI, Bengaluru.	2016
19. Invited seminar, International Centre for Theoretical Sciences, TIFR.	2016
20. Invited cosmology seminar, Perimeter institute.	2016
21. Cosmology lunch, joint w/ IAS and Princeton University.	2016
22. Astrophysics informal seminar, IAS.	2016
23. Seminar, Inter University Center for Astronomy and Astrophysics, Pune.	2015
24. Seminar, National Center for Radio Astronomy, Pune.	2015
25. Talk, The Primordial Universe after Planck, IAP, Paris.	2014
26. Seminar, McGill University, Montreal.	2014
27. Seminar, CITA, Toronto.	2014
28. ITC Seminar, Harvard University, Boston.	2014
29. Cosmology lunch, joint w/ IAS and Princeton University.	2014
30. Talk, Theoretical Astrophysics in Southern California (TASC), UCSD, San Diego.	2014
31. Special seminar, KICP, University of Chicago.	2014
32. Cosmology Lunch talk, CCAPP, Ohio State University, Columbus.	2014
33. Poster, Gravitational Wave Physics and Astronomy Workshop (GWPAW) at IUCAA, Pune.	2013
34. Seminar, Inter University Center for Astronomy and Astrophysics, Pune.	2013
35. Talk, Theoretical Astrophysics in Southern California (TASC), Carnegie Observatories, Pasadena.	2012
36. Poster, Summer school on cosmology, ICTP, Trieste.	2012

Teaching Experience and outreach

- Lecturer, Summer School on Gravitational-Wave Astronomy, ICTS, Bangalore. Aug 2018
- Teaching assistant for Ph 12a: Waves, taught by Jeff Kimble Fall 2012

- Volunteer for event on occasion of partial solar eclipse Oct 2014
Location: McKinley School, Pasadena
- Volunteer for public viewing of Supernova SN2014J Jan 2014
Location: California Institute of Technology, Pasadena
- Volunteer for public event on the occasion of Venus transit May 2012
Location: California Institute of Technology, Pasadena

References

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