

# 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

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

## Academic Honors

Friends of the Institute Membership Institute for Advanced Study	2018 - Present
Schmidt Fellowship Institute for Advanced Study	2015
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

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

## Refereed publications

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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

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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

## $n^{\text{th}}$ author papers

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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

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- 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

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- 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](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](http://www.its.caltech.edu/~tnerella/waveplate_07.pdf)

## Talks and presentations

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| 1. Invited panelist, The Future of Gravitational-Wave Astronomy, Bangalore. | 2019 |
| 2. Invited Seminar, International Centre for Theoretical Sciences, TIFR.    | 2019 |
| 3. Invited Seminar, Princeton Gravity Initiative, Princeton.                | 2019 |
| 4. Invited Seminar, Albert Einstein Institute, Potsdam.                     | 2019 |
| 5. Invited Seminar, Center for Cosmology and Particle Physics, NYU.         | 2019 |
| 6. Invited Seminar, Astronomy and Astrophysics, UC Santa Barbara.           | 2019 |
| 7. Invited Colloquium, Department of Physics, UC Santa Barbara.             | 2019 |
| 8. Invited panelist, Physics and Astrophysics at the eXtreme, IUCAA, Pune.  | 2018 |

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

## Teaching Experience and outreach

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- 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  
Location: California Institute of Technology, Pasadena

May 2012

## References

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