

# 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.**, 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
2. 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
3. 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
4. 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
5. **Venumadhav, T.**, Dai, L., Miralda-Escudé, J., (2017), Astrophysical Journal, 850, 49  
Title: Microlensing of extremely magnified stars near caustics of galaxy clusters
6. 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
7. **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
8. 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

9. **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
10. **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
11. **Venumadhav, T.**, & Hirata, C. M. (2015), Physical Review D, 91, 123009  
Title: Stability of small-scale baryon perturbations during cosmological recombination
12. **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
13. **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. Roulet, J., Dai, L., **Venumadhav, T.**, Zackay, B., Zaldarriaga, M., (2019), arXiv:1904.01683  
Title: Template Bank for Compact Binary Coalescence Searches in Gravitational Wave Data: A General Geometric Placement Algorithm
2. Coleman, M., **Venumadhav, T.**, Zackay, B., (2019), arXiv:1903.04978  
Title: Gravitational-wave-moderated Accretion: The Case of ES Ceti
3. **Venumadhav, T.**, Zackay, B., Roulet, J., Dai, L., Zaldarriaga, M., (2019), arXiv:1902.10341  
Title: A New Search Pipeline for Compact Binary Mergers: Results for Binary Black Holes in the First Observing Run of Advanced LIGO
4. Zackay, B., **Venumadhav, T.**, Dai, L., Roulet, J., Zaldarriaga, M., (2019), arXiv:1902.10331  
Title: A Highly Spinning and Aligned Binary Black Hole Merger in the Advanced LIGO First Observing Run
5. Kaurov, A., Dai, L., **Venumadhav, T.**, Miralda-Escudé, J., Frye, B., (2019), arXiv:1902.10090  
Title: Highly Magnified Stars in Lensing Clusters: New Evidence in a Galaxy Lensed by MACS J0416.1-2403
6. 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
7. 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
8. Zackay, B., Dai, L., **Venumadhav, T.**, (2018), arXiv:1806.08792  
Title: Relative Binning and Fast Likelihood Evaluation for Gravitational Wave Parameter Estimation
9. Dai, L., **Venumadhav, T.**, Zackay, B., (2018), arXiv:1806.08793  
Title: Parameter Estimation for GW170817 using Relative Binning
10. 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 Seminar, Center for Cosmology and Particle Physics, NYU.  | 2019 |
| 2. Invited Seminar, Astronomy and Astrophysics, UC Santa Barbara.  | 2019 |
| 3. Invited Colloquium, Department of Physics, UC Santa Barbara.  | 2019 |
| 4. Invited panelist, Physics and Astrophysics at the eXtreme, IUCAA, Pune.   | 2018 |
| 5. Invited talk, Thermal history of the Universe at intermediate redshift: progress with 21cm absorption measurements, CERN. | 2018 |
| 6. Talk, Shedding Light on the Dark Universe with Extremely Large Telescopes, UCLA.  | 2018 |
| 7. Invited Cosmology seminar, JHU, Baltimore.  | 2017 |
| 8. Invited Seminar, CITA, Toronto.   | 2017 |
| 9. Talk, Fundamental Physics with the Square Kilometer Array, Mauritius.   | 2017 |
| 10. Invited talk, Tianlai Collaboration Meeting, Fermilab, Batavia.  | 2016 |
| 11. Invited talk, CMB Spectral Distortions From Cosmic Baryon Evolution, RRI, Bengaluru.                                     | 2016 |
| 12. Invited seminar, International Centre for Theoretical Sciences, TIFR.  | 2016 |
| 13. Invited cosmology seminar, Perimeter institute.  | 2016 |

14. Cosmology lunch, joint w/ IAS and Princeton University.	2016
15. Astrophysics informal seminar, IAS.	2016
16. Seminar, Inter University Center for Astronomy and Astrophysics, Pune.	2015
17. Seminar, National Center for Radio Astronomy, Pune.	2015
18. Talk, The Primordial Universe after Planck, IAP, Paris.	2014
19. Seminar, McGill University, Montreal.	2014
20. Seminar, CITA, Toronto.	2014
21. ITC Seminar, Harvard University, Boston.	2014
22. Cosmology lunch, joint w/ IAS and Princeton University.	2014
23. Talk, Theoretical Astrophysics in Southern California (TASC), UCSD, San Diego.	2014
24. Special seminar, KICP, University of Chicago.	2014
25. Cosmology Lunch talk, CCAPP, Ohio State University, Columbus.	2014
26. Poster, Gravitational Wave Physics and Astronomy Workshop (GWPAW) at IUCAA, Pune.	2013
27. Seminar, Inter University Center for Astronomy and Astrophysics, Pune.	2013
28. Talk, Theoretical Astrophysics in Southern California (TASC), Carnegie Observatories, Pasadena.	2012
29. 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 Location: McKinley School, Pasadena	Oct 2014
• Volunteer for public viewing of Supernova SN2014J Location: California Institute of Technology, Pasadena	Jan 2014
• Volunteer for public event on the occasion of Venus transit Location: California Institute of Technology, Pasadena	May 2012

## References

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Columbus, OH 43210, USA  
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