

Teerthal Patel

Arizona State University

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EDUCATION

PhD in Physics

Arizona State University, U.S.A
Advisor: Tanmay Vachaspati

August 2019 - Present

MSc in Physics

Nagoya University, Japan
Thesis title: 'Resonant magnetic field generation in string axiverse.'
Advisor: Yuko Urakawa

October 2017 - September 2019

BSc in Physics

Nagoya University, Japan

October 2013 - September 2017

Publications

Teerthal Patel & Tanmay Vachaspati, "Annihilation of electroweak dumbbells." *arXiv preprint arXiv:2311.00026* (2023). [To be submitted to JHEP]

Teerthal Patel & Tanmay Vachaspati, "Structure of electroweak dumbbells." *Physical Review D* 107.9 (2023): 093010. [arXiv:2302.04886]

Teerthal Patel & Tanmay Vachaspati, *Kibble Mechanism for Electroweak Monopoles and Magnetic Fields*. *J. High Energ. Phys.* 2022, 59 (2022). [arXiv:2108.05357]

Rogier A. Windhorst, Timothy Carleton, Rosalia O'Brien, Seth H. Cohen, Delondrae Carter et al., *SKYSURF: Constraints on Zodiacal Light and Extragalactic Background Light through Panchromatic HST All-sky Surface-brightness Measurements. I. Survey Overview and Methods*, *Astron.J.* 164 (2022) 4, 141. [arXiv: 2205.06214]

Teerthal Patel, Yuko Urakawa & Hiroyuki Tashiro, *Resonant magnetogenesis from axions, 2020* *J. Cosmol. Astropart. Phys.* 2020 043 [arXiv:1909.00288]

Research Interests

Early Universe Physics (Cosmological phase transitions, cosmological defects, magnetogenesis, baryogenesis, primordial gravitational waves, magneto-hydrodynamics, (p)reheating),
High-Energy Physics (Electroweak physics, Monopoles),
Dark Matter (Phenomenology, Ultra-light axionic dark matter searches)

Computing Skills and Languages

Programming Languages: Python, Fortran & Julia.

Skills: Field theory simulations, numerical relativity simulations, data analysis, high performance computing & 3D visualization.

Programs: MPI, CUDA, Paraview, Plotly, PENCIL, Axionpy, Astropy, FermiTools & CRPropa.

Invited Talks

- ‘Electroweak Dumbbells and their dynamics’,
The Early Universe: A Window to New Physics, UF, Florida, USA *October 20th-22nd, 2023*
- ‘Electroweak Dumbbells and their dynamics’,
IBS CTPU-CGA 2023 Workshop on Defects, IBS, South Korea. *June 26th-30th, 2023*

Schools and Workshops

- Michigan Cosmology Summer School 2023,
Ann Arbor, Michigan, U.S.A. *June 14th-15th, 2023*
- Gravitational Waves 2018 summer school,
Les Houches School of Physics, France. *July 2nd- July 27th, 2018*

Talks, Presentations and Posters

- PASCOS 2023, University of California, Irvine. *June 26th-30th, 2023*
- 2022 APS Four Corners Meeting, University of New Mexico.
Parallel talk: Session M01, Nuclear/Particle Physics III. *October 14th-15th, 2022*
- 2021 APS Four Corners Meeting, University of Colorado, Boulder.
Session K02: Gravitational Physics. *October 9th, 2021*
- MOLECULE workshop on ‘Resonant Instabilities in
Cosmology’, YITP, Yukawa Institute for Theoretical
Physics, Kyoto. *March 7th – March 20th, 2019*
- Accelerating Universe in the Dark,
Yukawa Institute for Theoretical Physics, Kyoto. *March 4th - March 8th, 2019*
- The 27th Workshop on General Relativity and Gravitation
in Japan (JGRG27), Hiroshima. *November 27th- December 1st, 2017*
- Gravity and Cosmology 2018, Yukawa Institute for
Theoretical Physics, Kyoto. [*Poster*] *January 29th- March 9th, 2018*
- Seminar on ‘*Resonant magnetogenesis from axions*’,
ICG, Portsmouth. (*Hosted by David Wands*) *September 5th, 2018*

Scholarships and Grants

- ASU GPSA travel grant. *June 2023*
- ASU Physics Department travel grant. *June 2023*
- Summer University Graduate Fellowship, ASU. *Summers of 2020-2023*
- Japanese Government’s MEXT Scholarship. *October 2017 - September 2019*
- Research grant by PhD Toryumon. *October 2017 - September 2019*
- Nagoya University’s G30 International
Undergraduate Scholarship. *October 2013 - September 2017*
- JASSO Scholarship. *October 2013 - April 2014*

International Research and Science Communication

<i>'Leading forum 2018'</i> , Tokyo Institute of Technology, with poster on <i>'Improvement of Science Communication in Japanese Academia'</i> .	<i>December 4th, 2018</i>
<i>University Research and Innovation Conference 2018</i> , University of Portsmouth, UK.	<i>September 6th, 2018</i>
<i>'Research communication in action'</i> course funded by Toryumon, IAD, Edinburgh, UK.	<i>August 28th - September 1st, 2018</i>
<i>'Environmental Assessment in Ulaanbaatar'</i> workshop by Toryumon, Mongolia.	<i>February 23rd - March 4th, 2018</i>
<i>'Sustainable development goals (SDGs)'</i> workshop by Toryumon, Cambodia.	<i>November 4th - 12th, 2017</i>

Work Experience

(Volunteer) Cosmology Initiative Friday seminar organizer, ASU.	<i>August 2022 – Present</i>
(Volunteer) GPSA grant reviewer, ASU.	<i>June 2023 – Present</i>
Research assistant, Physics Department, ASU.	<i>Summers of 2021, 2022 & 2023</i>
Physics teaching assistant, Physics Department, ASU.	<i>August 2019 – Present</i>
English instructor, The Teaching Room, Takahama, Aichi, Japan.	<i>April 2016 - August 2017</i>