

# Manish Khanal

PhD Candidate, Department of Physics and Astronomy  
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[Google Scholar](#) | [Personal Website](#) | [LinkedIn](#)

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I am a PhD candidate in Physics at the University of Utah, focusing on neutrino astrophysics and renewable energy systems for Antarctic research. My work involves analyzing high-energy neutrino emission from Seyfert galaxies with IceCube data and assessing sustainable energy solutions for the IceCube-Gen2 facility. I also contribute to outreach through the IceCube Masterclass, introducing students to cosmic rays, neutrinos, and data analysis tools.

## EDUCATION

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<b>Aug 2022 – Present</b>	PhD in Physics University of Utah, Salt Lake City, Utah
<b>Feb 2015 – Oct 2019</b>	Bachelor in Physics Amrit Campus, Tribhuvan University, Kathmandu, Nepal

## RESEARCH INTEREST

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- Renewable Energy Systems for Antarctic research stations
  - Neutrino Astrophysics with a focus on Seyfert galaxies
  - Data-driven physics analysis using machine learning

## TEACHING EXPERIENCE

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<b>Aug 2022 – May 2023</b>	Teaching Assistant for <b>PHYS 2020</b> course under Dr. Kelby Hahn Leading the discussion section, grading homework and exams
<b>Jan 2020 – Jun 2022</b>	Pragya Secondary School, Kathmandu, Nepal Teacher (Mathematics and Science) for Secondary School Level

## COMPUTATIONAL SKILLS

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- **Programming and Data Analysis:** Python (analysis, visualization), MS Excel
  - **Scientific Tools:** Beamer, Origin, GNU plot

## PUBLICATIONS

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### Independent

- **Khanal, M., & Rott, A. (2025).** *Sustainability and Environmental Impact of IceCube-Gen2. Proceedings of Science (PoS), ICRC 2025.*
- Gautam, S. P., Silwal, A., Basyal, A., Chaudhary, K., **Khanal, M.**, Ale, B., Adhikari, B., Poudel, P., Karki, M., & Chapagain, N. P. (2021). *Tracking IMF Fluctuations near Sun using Wavelet Analysis: Parker Solar Probe First Encounter Data. Geomagnetism and Aeronomy.*
- Gautam, S. P., Silwal, A., Tiwari, M., Subedi, S., **Khanal, M.**, & Jha, A. K. (2021). *Dust Properties of Two New Cavity Structures Nearby Asymptotic Giant Branch Stars: The IRAS Survey. Journal of Institute of Science and Technology*, 26(2), 119–126. <https://doi.org/10.3126/jist.v26i2.41556>

### Collaboration Papers (IceCube Collaboration)

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- Abbasi, R., Ackermann, M., Adams, J., Agarwalla, S. K., Aguilar, J. A., Ahlers, M., ... **Khanal, M.**, ... & Hoffman, K. D. (2024). *Characterization of the astrophysical diffuse neutrino flux using starting track events in IceCube*. *Physical Review D*, 110(2), 022001.
- Abbasi, R., Ackermann, M., Adams, J., Agarwalla, S. K., Aguilar, J. A., Ahlers, M., ... **Khanal, M.**, ... & Hill, G. C. (2024). *Search for an eV-Scale Sterile Neutrino Using Improved High-Energy  $\nu\mu$  Event Reconstruction in IceCube*. *Physical Review Letters*, 133(20), 201804.

For complete list of publications, see my Google Scholar profile: [Google Scholar – Manish Khanal](#)

## **WORKSHOPS AND PROJECTS**

<b>April 2024, 2025,</b>	<b>Organization Team Member – IceCube Masterclass (2024, 2025)</b> <ul style="list-style-type: none"> <li>• Helped high school students understand the basics of neutrino astrophysics and cosmic rays.</li> <li>• Guided students in using analysis tools from the IceCube Neutrino Observatory.</li> </ul>
<b>May 2023 – Aug 2023</b>	Worked on “ <b>Feasibility Assessment of Solar Photovoltaics as a Sustainable Energy Source for Power Generation for the IceCube Gen2 Construction</b> ” as a part of the Swigart Fellowship Program for summer 2023
<b>Nov 2020 – Feb 2021</b>	The third Kathmandu Astrophysics School on “ <b>Introduction to astronomical observations and data analysis</b> ” (KAS20) organized by the University of Melbourne (Australia)
<b>Jul 2020</b>	<b>Computational Workshop on Space Science</b> organized by NSRS and completed the project on "Study of Variation of Solar wind parameter during Parker Solar Probe (PSP) closest encounter (0.17AU) to Sun"
<b>Sep 2019</b>	<b>Workshop on Space Weather and Upper Atmosphere Physics (WSWUAP-2019)</b> ” jointly organized by the Department of Physics, Amrit Campus, Tribhuvan University, Nepal, and The Abdus Salam International Center for Theoretical Physics (ICTP), Trieste, Italy, and completed the project on "Study of TEC Variation at different stations of Nepal during Strong Geomagnetic Storm in 2018"

## **CONFERENCES & SCHOOLS**

<b>June 2023</b>	<b>IceCube Summer School</b> organized by <b>University of Wisconsin Madison</b>
<b>Oct 2023</b>	Poster Presentation on <b>American Physical Society (APS) 4 Corners</b> meeting
<b>Jul 2020</b>	<b>1<sup>st</sup> International e-Conference on Recent Advances in Physics and Material Science (IC-RAPMS 2020)</b> organized by Kurseong College, Darjeeling in collaboration with St. Joseph’s College, Darjeeling, West Bengal, India
<b>May 2019</b>	<b>School of Astronomy and Space Science</b> organized by B.P Koirala Memorial Planetarium, Observatory and Science Museum Development Board, Nepal
<b>Dec 2018</b>	<b>The Physics without Frontiers Winter School</b> jointly organized by The Abdus Salam International Center for Theoretical Physics (ICTP), Trieste, Italy, and Kathmandu University, Nepal