

Postdoctoral Research Fellow in Neutrino Phenomenology
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iNSPIRE

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RESEARCH PROFILE

I am a phenomenologist working on neutrino and dark matter physics. I find the measurements next-generation neutrino detectors weren't designed for, and show they can make them. My work has two main directions. The first is new measurements with neutrinos, from leptonic CP violation with sub-GeV atmospheric neutrinos to ν_τ appearance in JUNO and neutral-current solar neutrinos in DUNE. The second is new probes of dark matter and physics beyond the Standard Model, with the same detectors and with astrophysical systems. Both rest on particle transport, atmospheric fluxes, and detector modelling that I build into open tools now used across the field, and on direct experience inside the IceCube, P-ONE, and Borexino collaborations, which keeps the predictions honest about backgrounds and systematics. The phenomenology targets JUNO, Hyper-K, DUNE, KM3NeT, IceCube, and P-ONE.

SELECTED HIGHLIGHTS

- **New measurements with neutrinos.** Proposed and developed the frameworks for measurements next-generation detectors were not designed for. These include leptonic CP violation with sub-GeV atmospheric neutrinos (Hyper-K, DUNE), atmospheric ν_τ appearance via neutral currents (JUNO), neutral-current solar neutrino detection (DUNE), and the cosmic-ray spectrum measured through atmospheric neutrinos.
- **Dark matter and new physics with neutrino detectors.** New probes of dark matter captured in Jupiter and annihilating in the Galaxy, dark matter-nucleon interactions constrained by ultrahigh-energy cosmic-ray acceleration, stellar probes (white dwarfs, stars orbiting supermassive black holes), and the first neutrino-telescope limits on long-lived supersymmetric particles.
- **Predictions that hold up at the detector level.** Collaboration member of IceCube, P-ONE, and Borexino, providing the atmospheric-cascade and bioluminescence background models their analyses depend on. My phenomenology for Hyper-K, DUNE, JUNO, and KM3NeT is independent of those collaborations, but is built on that experience.
- **Open tools.** Lead developer and maintainer of **Prometheus**, the open-source neutrino telescope simulation now used across the field, and author of **softpaws** (analytic neutrino-telescope effective areas), **Fennel** (light yields) and **bib-checker** (bibliography validation against INSPIRE).
- **Independent visibility.** 13 invited talks and seminars, including Stanford, Harvard, Queen's, Texas A&M, Ohio State, UNSW, and the Mitchell Conference.
- **Mentoring.** Supervised three PhD students, two Master's students, and three undergraduate or junior researchers. Graduate lecturer in dark matter direct detection. Organized the Melbourne theory seminar series.
- **Funding and recognition.** Marie Curie Seal of Excellence (2021), Laby Early Career Researcher Award, and an ARC Centre of Excellence for Dark Matter ECR Special Initiatives grant.

RESEARCH THEMES

- **New measurements with neutrinos.** Leptonic CP violation with sub-GeV atmospheric neutrinos (targeting Hyper-K and DUNE), ν_τ appearance (JUNO), solar neutrinos via neutral currents (DUNE), and the cosmic-ray spectrum measured through atmospheric neutrinos.
- **Dark matter and new physics with neutrino detectors.** Dark matter captured in Jupiter and annihilating in the Galaxy, dark matter-nucleon interactions probed through ultrahigh-energy cosmic-ray acceleration, stellar probes (white dwarfs, stars near supermassive black holes), and long-lived particles produced in air showers.

- **Particle transport and open simulation.** Analytic muon transport and telescope effective areas (softpaws), atmospheric fluxes and cascades, and open, geometry-agnostic detector simulation (Prometheus, Fennel) with public benchmarks, built to make the phenomenology above testable before the detectors exist.

ACADEMIC APPOINTMENTS

University of Iowa Postdoctoral Research Fellow	USA Oct. 2025 – Current
– Developing theoretical methods for atmospheric neutrinos and leptonic CP violation. – Developing phenomenology targeting Hyper-K and DUNE. – Supervising graduate research. Graduate lecturer in dark matter direct detection.	
Fermi National Accelerator Laboratory Affiliate / User	USA Feb. 2026 – Current
– Supporting phenomenological work for the laboratory’s neutrino program, including DUNE.	
The University of Melbourne Postdoctoral Research Fellow in Neutrino Phenomenology	Australia Sep. 2022 – Aug. 2025
– Established an independent research program spanning neutrino phenomenology, dark matter theory, and detector simulation. – Proposed new measurement channels for JUNO (ν_τ appearance) and DUNE (neutral-current solar neutrinos). – Co-developed the Prometheus open-source neutrino telescope simulation. Supervised one PhD and one Master’s student, and organized the theory seminar series (2023 to 2025). – Attracted competitive early-career funding from the Laby ECR Award and the ARC CoE Dark Matter ECR Special Initiatives program.	
The University of Melbourne Honorary Fellow	Australia Oct. 2025 – Jun. 2026
Ohio State University (CCAPP) Affiliate Fellow	USA Sep. 2022 – Jun. 2026

Collaboration membership. P-ONE (2019 to present) and IceCube (2017 to 2023), contributing atmospheric-cascade and bioluminescence background modelling, dark matter and new-physics analyses. Earlier work with Borexino on cosmic muon modulations.

FUNDING AND AWARDS

- **ARC Centre of Excellence for Dark Matter Particle Physics, ECR Special Initiatives Program** (12,000 AUD, 2023)
Competitive early-career grant supporting an independently proposed dark matter research project.
- **Laby Early Career Researcher Award** (4,000 AUD, 2023)
School of Physics award recognizing outstanding early-career research at the University of Melbourne.
- **Marie Curie Seal of Excellence** (2021), project “Nu-Eyes”
European Commission recognition of a self-authored fellowship proposal rated above the funding threshold.
- **TUM and Imperial College London Collaboration Fund** (\$2,680, 2019)
Seed funding for “Advanced mathematical models for the simulation chain of neutrino detectors.”

EDUCATION

Technical University Munich Dr. rer. nat. in Physics, <i>summa cum laude</i> . Advisor: Prof. Elisa Resconi	Germany 2017–2021
– Thesis: “Precision Background Modelling for Neutrino Detectors.” Cascade-equation, Monte Carlo, and machine-learning methods for particle transport in neutrino detectors.	

Technical University Munich
M.Sc. Physics. Advisor: Prof. Andreas Weiler

University of Innsbruck
B.Sc. Physics. Advisor: Prof. Gebhard Gröbl

Germany
2014–2017

Austria
2011–2014

INVITED TALKS AND SEMINARS

- **Queen’s University**, Kingston, Canada, 2026. *Probing Dark Matter Interactions Near Supermassive Black Holes*
- **Mitchell Conference**, College Station, USA, 2026. *Towards Measuring CP Violation with Atmospheric Neutrinos*
- **Stanford University**, Stanford, USA, 2026. *Towards Measuring CP Violation with Atmospheric Neutrinos*
- **PPC**, Deadwood, USA, 2025. *Three unique analyses for three new neutrino detectors*
- **Harvard University**, Boston, USA, 2024. *Three unique analyses for three new neutrino detectors*
- **Texas A&M University**, College Station, USA, 2024. *Enhancing DUNE’s solar neutrino capabilities with neutral-current detection*
- **University of New South Wales**, Sydney, Australia, 2024. *Observing Atmospheric Tau Neutrino Appearance with JUNO*
- **Ohio State University**, Columbus, USA, 2023. *Prometheus: Public Neutrino Telescope Simulation Software*
- **Dark Ghosts III**, Granada, Spain, 2022. *Dark Matter Searches with IceCube*
- **CORSIKA Workshop**, Karlsruhe, Germany, 2020. *CORSIKA: Beyond Air Showers*
- **CORSIKA Workshop**, Karlsruhe, Germany, 2020. *Electromagnetic Showers*
- **CORSIKA Workshop**, Karlsruhe, Germany, 2019. *EmCa: Electromagnetic Cascades Simulation Framework*
- **Workshop on Atmospheric Neutrino Production, MeV to PeV**, Nagoya, Japan, 2019. *3D Cascade Equations*

TEACHING AND MENTORING

Summary. I have supervised three PhD students, two Master’s students, and three undergraduate or junior research projects, and I deliver graduate lectures in dark matter and particle physics. My mentoring model is to give students a self-contained piece of a larger program, with a clear path to publication. The work of Ho Man Yim (PhD candidate, Melbourne) on sub-GeV atmospheric CP violation grew directly into a paper, and Kruteesh Desai, whose Bachelor’s project I supervised, went on to lead a published dark matter search with IceCube and P-ONE.

- **Lecturer**, University of Iowa. Dark Matter Direct Detection (graduate lectures).
- **PhD supervision.** Esmenaz Isik (Iowa), “Solar Atmospheric Neutrinos”. Ruohan Li (TUM), “Dark Matter and Bioluminescence Searches with P-ONE”. Ho Man Yim (Melbourne), “Probing CP Violation with Sub-GeV Atmospheric Neutrinos”.
- **Master’s supervision.** Jeongoh Park (Melbourne), “Dark Matter Annihilation Signals in JUNO”. Jan Henrik Schmidt-Dencker (TUM), “Stau Search in IceCube”, published as an ICRC proceeding.
- **Undergraduate and junior supervision.** Kruteesh Desai (TUM), “Solar Atmospheric Neutrino Modelling”. Fruzsina Mädlings (TUM), “Search for Muon Tracks in STRAW Deep-Sea Data”. Mingyang Li (TUM), “Muons from Electromagnetic Showers”.
- **Teaching Assistant**, TUM. Experimental Physics 1, 3, and 4, and Theoretical Mechanics (summer course), 2018 to 2020.
- **Research community.** Organized and ran the theory seminar series at the University of Melbourne for two years, 2023 to 2025.
- **Group infrastructure.** Two open tools support research training. **nestling** ([GitHub](#)) is an onboarding framework for new students, and **jc-ppi** ([GitHub](#)) runs a journal club.

PUBLIC SOFTWARE

Open simulation tools are a core research output. They exist to make the phenomenology testable, and they are used by the neutrino-telescope community to model detectors that do not yet exist and the environments they will be built in. Listed here are the codes built for general use. Analysis code for individual papers lives on [GitHub](#).

- **softpaws**  [docs](#)
Neutrino-telescope effective areas from muon transport, without a detector simulation. Solves high-energy muon transport analytically and turns the muon range into the volume a detector effectively watches, giving effective areas, event rates and single-track energies. One code serves IceCube, KM3NeT/ARCA, P-ONE, TRIDENT and Baikal-GVD, so published effective areas can be reproduced, explained and carried to detectors that have not been simulated yet. Author and maintainer.
- **Prometheus**  [docs](#)
Open-source, end-to-end simulation framework for neutrino telescopes. Generates events and detection-module photon hits for user-defined detector geometries in water or ice. Lead developer and current maintainer. Released publicly (Comput. Phys. Commun. 2024) and adopted as a community baseline, including for the NuBench event-reconstruction benchmark.
- **Fennel**  [docs](#)
Fast parametric Cherenkov light yields for tracks and cascades. Predicts photon counts and timing distributions from muon tracks, electromagnetic showers, and hadronic showers in ice or water. Author and maintainer. Provides the light-yield backend used in Prometheus.
- **bib-checker**  [docs](#)
Check a BibTeX file against INSPIRE and fix what is wrong. Command-line tool that checks every entry of a .bib file against InspireHEP, flags missing or mismatched records, suggests canonical replacements and writes a corrected file. Author and maintainer.

SELECTED WORKS AND CONTRIBUTIONS

Grouped by research theme. Contribution statements describe my role. Full record on [INSPIRE](#).

Neutrino phenomenology and precision oscillation physics

- **Towards Measuring the CP-Violating Phase with Atmospheric Neutrinos** (2026, submitted)
Introduced a phenomenological framework showing that sub-GeV atmospheric neutrinos provide competitive sensitivity to the CP-violating phase in next-generation detectors, opening a measurement channel independent of accelerator systematics.
Contribution: Conceived the project, developed the formalism, designed the analysis strategy, supervised the student implementation, co-wrote the manuscript.
- **Enhancing DUNE's Solar Neutrino Capabilities with Neutral-Current Detection** (Phys. Rev. Lett., 2025)
Identified and quantified a neutral-current detection channel that substantially extends DUNE's solar neutrino reach and flavor sensitivity.
Contribution: Conceived the project, developed the theoretical and detector-response framework, led the analysis, co-wrote the manuscript.
- **New Signal of Atmospheric Tau Neutrino Appearance: Sub-GeV Neutral-Current Interactions in JUNO** (Phys. Rev. D, 2024)
Proposed a new signature, sub-GeV neutral-current interactions, giving JUNO access to atmospheric ν_τ appearance.
Contribution: Conceived the project, developed the signal model, led the simulation and analysis, co-wrote the manuscript.

Dark matter and beyond-the-Standard-Model physics

- **New Multimessenger Probe of Dark Matter-Nucleon Interactions from Ultrahigh Energy Cosmic Ray Acceleration** (Phys. Rev. D, 2026)
Showed that dark matter-nucleon scattering would degrade cosmic-ray acceleration, turning the existence of the observed UHECR spectrum into a new constraint on dark matter interactions.
Contribution: Conceived the project, developed the theoretical framework, led the calculations, wrote the manuscript.

- **New Constraints on Supersymmetry Using Neutrino Telescopes** (Phys. Lett. B, 2020)
Derived new limits on long-lived staus using neutrino telescope signatures, establishing a BSM use case for these detectors.
Contribution: Conceived the project, developed the theoretical framework, led the simulations, wrote the manuscript, supervised the follow-up student analysis in IceCube.

Particle transport and open simulation

- **Prometheus: An Open-Source Neutrino Telescope Simulation** (Comput. Phys. Commun., 2024)
Delivered the first public, geometry-agnostic simulation framework for neutrino telescopes in water and ice, allowing proposed detector designs to be evaluated without collaboration-internal software.
Contribution: Lead developer with J. Lazar, wrote the framework and the photon-propagation and light-yield chain, co-wrote the manuscript. Now a community baseline, for example in the NuBench reconstruction benchmark.

INTERDISCIPLINARY AND APPLIED WORK

The methods I develop for particle transport and Monte Carlo simulation transfer beyond particle physics. The deep-sea optical work below is the origin of Fourth Day and of the optical background model P-ONE relies on.

- **Polychromatic Population of Bioluminescent Organisms in the Deep Pacific Ocean** (J. Geophys. Res. Oceans, 2026). Four years of STRAW camera and PMT data in the Cascadia Basin, characterizing the chromatic, temporal, and tidal structure of deep-sea bioluminescence. [link](#)
- **Bioluminescence Modeling for Deep Sea Experiments** (2021). Simulation framework coupling water currents to organism light emission, released as the Fourth Day code. [arXiv](#)
- **Two-Year Optical Site Characterization for the Pacific Ocean Neutrino Experiment (P-ONE) in the Cascadia Basin** (2021). Deep-sea optical characterization establishing the P-ONE site. [arXiv](#)
- **The Impact of Digital Contact Tracing on the SARS-CoV-2 Pandemic** (EPJ Data Science, 2021). Agent-based Monte Carlo modelling of an epidemic, applying particle-physics simulation methods to a public health question. [link](#)

CONTRIBUTED TALKS

- **Phenomenology 2023**, Pittsburgh, USA. *Searching for Dark Matter Annihilation with IceCube and P-ONE*
- **DSU 2022**, Sydney, Australia. *Searching for Dark Matter Annihilation with IceCube and P-ONE*
- **EPS-HEP 2021**, online. *New constraints on supersymmetry using neutrino telescopes*
- **ICRC 2019**, Madison, USA. *Atmospheric Muons from Electromagnetic Cascades* (poster)
- **DPG 2019**, Aachen, Germany. *EmCa: Electromagnetic Cascades*
- In addition, eight contributed talks at IceCube, P-ONE, and SFB1258 collaboration meetings and workshops, 2018 to 2020.

ADDITIONAL EXPERIENCE AND LANGUAGES

- **Holo-Light**, Germany. Programmer (2017). Developed a precision VR input device, the “Holo-Stylus,” for the Microsoft HoloLens, and built and demonstrated a working prototype.
- **AVL Advanced Simulation Technologies**, Austria. Solver developer (2009, 2013, 2014). Acoustic modelling of car engines, improving a Fortran wave-based-technique framework in its integration methods and coordinate systems.
- **Austrian Red Cross**, Austria. Paramedic (2010/11). Paramedic training and duties during civil service.
- **Languages:** English and German (native).

PUBLIC ENGAGEMENT AND MEDIA

- **ABC News** (2025). Interviewed on the KM3NeT ultra-high-energy neutrino detection. [link](#)
- **Pursuit, University of Melbourne**. Authored feature: “Neutrinos are the Sun’s secret messengers.” [link](#)

PUBLICATIONS

84 published papers and 89 conference papers in total, most arising from membership in IceCube and P-ONE. Of these, **24 carry a major contribution from me**, and **19 are small-author-list works** (fewer than 10 authors). The full record is on [INSPIRE](#). The list below contains the works to which I made significant and essential contributions. Papers from experimental collaborations are listed separately, by experiment.

Submitted

- [1] S. A. Meighen-Berger, “Estimating High-Energy Neutrino Effective Areas from Muon Propagation”, Sep. 2026. arXiv: [2609.40188 \[hep-ph\]](#),
Contribution: Wrote the paper, developed the idea.
- [2] C. A. Argüelles, P. S. B. Dev, B. Dutta, G. Herrera, N. Kamp, J. Kumar, S. A. Meighen-Berger, M. Rai, and I. M. Shoemaker, “Astrophysical Neutrino Sources as Colliders”, Jul. 2026. arXiv: [2607.19254 \[hep-ph\]](#),
Contribution: Developed the production of neutrinos from pp and $p\gamma$ interactions.
- [3] S. A. Meighen-Berger, R. A. Gustafson, N. F. Bell, J. L. Newstead, S. Robles, and I. M. Shoemaker, “Dark matter energy exchange in stars orbiting supermassive black holes”, Jul. 2026. arXiv: [2607.00840 \[hep-ph\]](#),
Contribution: Co-wrote the paper, developed the idea.
- [4] J. F. Beacom, N. F. Bell, M. J. Dolan, S. A. Meighen-Berger, and H. M. Yim, “Towards Measuring the CP-Violating Phase with Atmospheric Neutrinos”, May 2026. arXiv: [2605.16721 \[hep-ph\]](#),
Contribution: Co-wrote the paper, developed the idea, mentored student.
- [10] S. A. Meighen-Berger, J. L. Newstead, and L. E. Strigari, “Measuring the Cosmic Ray Spectrum with Next Generation Neutrino Detectors”, May 2025. arXiv: [2505.09111 \[hep-ph\]](#),
Contribution: Co-wrote the paper, developed the idea.

Preprints

- [16] S. Meighen-Berger and M. Karl, “Dark Matter Hot Spots and Neutrino Telescopes”, Sep. 2021. arXiv: [2109.07885 \[hep-ph\]](#),
Contribution: Co-wrote the paper, developed the idea.
- [18] S. Meighen-Berger, R. Li, and G. Wimmer, “Bioluminescence modeling for deep sea experiments”, 2021. arXiv: [2103.03816](#),
Contribution: Co-wrote the paper, developed the idea, mentored student.
- [23] S. Meighen-Berger, A. Fedynitch, and M. Huber, “EmCa – Electromagnetic-Cascades Simulation Package”, Jul. 2019. arXiv: [1907.06924 \[astro-ph.HE\]](#),
Contribution: Co-wrote the paper, developed the idea.

Published

- [5] R. Li, C. Spannfellner, K. Holzapfel, S. Loipolder, C. Lagunas Gualda, M. Böhmer, M. Danninger, F. C. De Leo, C. Fruck, A. Gärtner, R. Gernhäuser, D. Grant, C. Haack, F. Henningsen, H. Johnson, C. Kopper, C. B. Krauss, K. Leismüller, S. A. Meighen-Berger, L. Papp, B. Pirenne, I. C. Rea, E. Resconi, L. Schumacher, and J. Stacho, “Polychromatic population of bioluminescent organisms in the deep pacific ocean”, *J. Geophys. Res. Oceans*, vol. 131, no. 7, e2025JC023267, 2026,
Contribution: Mentored student.
- [6] S. A. Meighen-Berger, P. S. B. Dev, and M. Hostert, “New multimessenger probe of dark matter-nucleon interactions from ultrahigh energy cosmic ray acceleration”, *Phys. Rev. D*, vol. 113, no. 10, p. 103050, 2026. arXiv: [2512.18093 \[hep-ph\]](#),
Contribution: Co-wrote the paper, developed the idea.

- [7] R. Ørsøe, S. Meighen-Berger, J. Lazar, J. Prado, I. Mozún-Mateo, A. Rosted, P. Weigel, and A. L. Anaya, “NuBench: An open benchmark for deep learning-based event reconstruction in neutrino telescopes”, *JINST*, vol. 21, no. 05, T05001, 2026. arXiv: [2511.13111 \[hep-ex\]](#),
Contribution: Wrote the simulation code and generated the public data sets.
- [9] P. Bhattacharjee, S. Robles, S. A. Meighen-Berger, and F. Calore, “Can local white dwarfs constrain dark matter interactions?”, *JCAP*, vol. 10, p. 093, 2025. arXiv: [2505.13629 \[hep-ph\]](#),
Contribution: Worked on the neutrino calculations and predictions.
- [11] S. Robles and S. A. Meighen-Berger, “Extending the dark matter reach of water Cherenkov detectors using Jupiter”, *Phys. Rev. D*, vol. 112, p. L041301, 2025. arXiv: [2411.04435 \[hep-ph\]](#),
Contribution: Co-wrote the paper, developed the neutrino calculations and sensitivities.
- [12] S. A. Meighen-Berger, J. L. Newstead, J. F. Beacom, N. F. Bell, and M. J. Dolan, “Enhancing DUNE’s Solar Neutrino Capabilities with Neutral-Current Detection”, *Phys. Rev. Lett.*, vol. 135, no. 1, p. 011803, 2025. arXiv: [2410.00330 \[hep-ph\]](#),
Contribution: Co-wrote the paper, developed the idea.
- [13] S. A. Meighen-Berger, J. F. Beacom, N. F. Bell, and M. J. Dolan, “New signal of atmospheric tau neutrino appearance: Sub-GeV neutral-current interactions in JUNO”, *Phys. Rev. D*, vol. 109, no. 9, p. 092006, 2024. arXiv: [2311.01667 \[hep-ph\]](#),
Contribution: Co-wrote the paper, developed the idea.
- [14] J. Lazar, S. Meighen-Berger, C. Haack, D. Kim, S. Giner, and C. A. Argüelles, “Prometheus: An open-source neutrino telescope simulation”, *Comput. Phys. Commun.*, vol. 304, p. 109298, 2024. arXiv: [2304.14526 \[hep-ex\]](#),
Contribution: Co-wrote the paper, developed the water-based simulation, co-developed the framework.
- [15] K. Desai, R. Li, and S. Meighen-Berger, “Searching for dark matter annihilation with IceCube and P-ONE”, *JCAP*, vol. 02, p. 049, 2024. arXiv: [2302.10542 \[hep-ph\]](#),
Contribution: Co-wrote the paper, developed the idea, mentored student.
- [19] T. R. Pollmann, S. Schönert, J. Müller, J. Pollmann, E. Resconi, C. Wiesinger, C. Haack, L. Shtembari, A. Turcati, B. Neumair, S. Meighen-Berger, G. Zattera, M. Neumair, U. Apel, and A. Okolie, “The impact of digital contact tracing on the sars-cov-2 pandemic—a comprehensive modelling study”, *EPJ Data Science*, vol. 10, no. 1, p. 37, 2021,
Contribution: Wrote one of the numerical models.
- [21] S. Meighen-Berger, M. Agostini, A. Ibarra, K. Krings, H. Niederhausen, A. Rappelt, E. Resconi, and A. Turcati, “New constraints on supersymmetry using neutrino telescopes”, *Phys. Lett. B*, vol. 811, p. 135929, 2020. arXiv: [2005.07523 \[hep-ph\]](#),
Contribution: Co-wrote the paper, developed the idea.

Proceedings

- [8] J. Lazar, A. L. Anaya, S. Meighen-Berger, I. Mozún-Mateo, R. Ørsøe, J. Prado, A. Rosted, and P. Weigel, “Open-source, Cross-detector Comparisons for Machine Learning Reconstructions in Neutrino Telescopes”, *PoS*, vol. ICRC2025, p. 1090, 2025,
Contribution: Co-wrote the paper, developed the training data set.
- [22] S. Meighen-Berger and M. Li, “Atmospheric muons from electromagnetic cascades”, *PoS*, vol. ICRC2019, p. 961, 2020. arXiv: [1910.05984 \[astro-ph.HE\]](#),
Contribution: Co-wrote the paper, developed the idea, mentored student.

Experimental Collaborations

P-ONE

- [20] M. Agostini et al., “The Pacific Ocean Neutrino Experiment”, *Nature Astron.*, vol. 4, no. 10, pp. 913–915, 2020. arXiv: [2005.09493 \[astro-ph.HE\]](#),
Contribution: Calculated neutrino veto and estimated stau sensitivity.

IceCube

- [17] J.-H. Schmidt-Dencker, S. Meighen-Berger, and C. Haack, “Search for STaus in IceCube”, in *37th International Cosmic Ray Conference*, Jul. 2021. arXiv: [2107.10049 \[astro-ph.HE\]](#),
Contribution: Mentored student.

Borexino

- [24] M. Agostini et al., “Modulations of the Cosmic Muon Signal in Ten Years of Borexino Data”, *JCAP*, vol. 02, p. 046, 2019. arXiv: [1808.04207 \[hep-ex\]](#),
Contribution: Calculated the atmospheric flux variations.