

Anjali Nambrath

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Education

Massachusetts Institute of Technology

June 2021

S.B. in Physics & Mathematics with minor in French, Phi Beta Kappa. GPA: 4.9/5.0

Selected coursework: Quantum Information Science, Quantum Mechanics III, Stochastic Processes, Algebra, Electromagnetism II, Nonlinear Dynamics: Chaos, Signals and Systems, Machine Learning

Research experience

Jacak Group @ UC Berkeley Lab assistant

Sep. 2021 - present

- Working on software for the Internal Tracking System with the ALICE collaboration
- Studying jet substructure observables to understand hadronization in heavy-ion jets

MIT Center for Theoretical Physics Undergrad researcher

Jan. 2021 - Aug. 2021

- Working with Dr. Katelin Schutz to understand axion gegenschein in the dark matter halo
- Identifying potential astrophysical sources of radio waves for a gegenschein survey

Hen Lab – MIT Hadronic Physics Group Undergrad researcher

Nov. 2017 - May 2021

- Analyze electron-deuterium scattering data from CLAS to test energy reconstruction methods
- Compared neutrino energy reconstruction methods for the Deep Underground Neutrino Experiment (DUNE)
- Calculated scintillator and photomultiplier efficiency for the Backward Angle Neutron Detector (BAND)
- Developed a laser-based calibration system to ensure measurement stability for BAND

Fermi National Accelerator Laboratory SULI research intern

June 2019 - Aug. 2019

- Simulated experimental data for DUNE using the GENIE Monte Carlo event generator
- Explored and verified the efficacy of reconstruction smearing matrices with electron data from CLAS

Teaching

MIT Educational Studies Program Teacher (Spark, Splash, HSSP)

2018 - 2021

- 6 one-hour sessions on relativity and black holes ("Black Holes!") for over 150 students
- 3 one-hour sessions on the Standard Model ("The Standard Model!") for 50 students
- 3-week course on modern physics ("Physics of the Extreme!") for 40 students
- 6-week course on quantum computing ("Quantum Computing!") for 40 students
- 6-week course on the history of science ("History of 20th Century Science") for 30 students

MIT Physics Department Teaching assistant

Jan. 2021

Teaching assistant for Computational Data Science in Physics, taught by Prof. Philip Harris. Taught and developed material for recitations twice a week and provided support on weekly data science projects.

MIT Mathematics Department Undergraduate teaching assistant

Fall 2020

Teaching assistant for Quantum Computing, taught by Prof. Peter Shor. Assembled lecture notes, moderated online lectures, conducted weekly office hours, and graded weekly problem sets.

Selected awards

MIT Physics Malcolm Cotton Brown Award (excellence in experimental physics)	June 2021
MIT Physics Order of the Lepton Award	June 2021
MIT Global Languages Awards for Excellence, First Prize	May 2021
Laya W. Wiesner Award (Institute Award for contributions to MIT community life)	May 2021
Finalist for Fulbright India Student Research award	2021-22
National Science Foundation Graduate Research Fellowship	2021-26
Berkeley Fellowship for incoming graduate students at UC Berkeley	2021-23
January Scholars in France for excellence in French Studies	Jan. 2020
Burchard Scholar for excellence in the humanities at MIT	2019
APS Division of Nuclear Physics CEU Fellowship	Oct. 2018

Publications

Axion dark matter-induced echo of supernova remnants	Phys. Rev. D 105, 063007 (2022)
Y. Sun, K. Schutz, A. Nambrath , et al.	
Electron Beam Energy Reconstruction for Neutrino Oscillation Measurements	Nature 599 (2021)
M. Khachatryan, A. Papadopoulou, A. Ashkenazi, F. Hauenstein, A. Nambrath , et al.	
Laser Calibration System for Time of Flight Scintillator Arrays	Nucl. Inst. Methods A 973 (2020)
A. Denniston et al.	
The CLAS12 Backward Angle Neutron Detector (BAND)	Nucl. Inst. Methods A 978 (2020)
E.P. Segarra et al.	

Presentations and posters

CLAS Collaboration Meeting	March 2022
Benchmarking neutrino energy reconstruction with electron-deuterium scattering	
IAIFI Internal Seminar (invited)	February 2021
Open Data Science in Physics Courses (with P. Harris, K. Morey, M. Szurek, J. Chongsathapornpong)	
APS Division of Nuclear Physics yearly meeting	October 2020
Benchmarking neutrino energy reconstruction with electron-deuterium scattering (abstract)	
MIT PRISM (departmental undergraduate conference)	August 2020
Benchmarking neutrino energy reconstruction with electron-deuterium scattering	
MIT Family Weekend Physics Open House (invited)	October 2018
Neutrons, Nuclei, and Neutrinos: BAND and Electrons for Neutrinos	
Fermilab and Argonne National Lab summer undergraduate poster session	August 2019
Studying the use of e- data for DUNE energy reconstruction (poster)	
APS Division of Nuclear Physics yearly meeting	October 2018
Testing and constructing BAND, a backward angle neutron detector (poster)	

Community involvement

Member of MIT OpenCourseWare Advisory Committee	Fall 2020 - Spring 2021
Member of MIT Physics Dept.'s Values Committee	Spring 2020 - Spring 2021
MIT Associate Advisor to four first-years	Fall 2020 - Spring 2021
Counselor for MIT Physics Pre-Orientation Program	Fall 2020
Board member of MIT Undergraduate Womxn in Physics	Spring 2019 - Spring 2021
President and Outreach Chair of MIT Society of Physics Students	Spring 2018 - Spring 2021
Editor of MIT Undergraduate Research Journal	Fall 2017 - Spring 2019

Languages

- **Programming/markup:** \LaTeX , Python, C++/ROOT, numpy/PyTorch
- **Written/spoken:** English (fluent), French (advanced), Malayalam (advanced)