Anjali Nambrath

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Education

Massachusetts Institute of Technology May 2021
B.S. in Physics & Mathematics with Computer Science, Minor in French. GPA: 4.8/5.0
Selected coursework: Quantum Information Science, Quantum Mechanics III, Intro. to Stochastic Processes, Statistical Mechanics, Electromagnetism II, Signals and Systems, Intro. to Machine Learning

Research Experience

Hen Lab – MIT Hadronic Physics Group Undergrad researcher Nov. 2017 - present

- Analyze electron data from Jefferson Lab to evaluate potential new deuterium-based neutrino detectors
- Evaluate novel energy reconstruction methods for the Deep Underground Neutrino Experiment (DUNE)
- Calculated scintillator and photomultiplier efficiency to optimize the Backward Angle Neutron Detector
- Developed a laser-based calibration system to ensure measurement stability in BAND

Fermi National Accelerator Laboratory Research intern (SULI program) June 2019 - Aug. 2019

- Simulated experimental data for DUNE using GENIE Monte Carlo methods
- Explored and verified novel energy reconstruction strategies using electron data from CLAS experiments
- Simulated and compared electron and neutrino collision kinematics for reconstruction analysis

Winslow Group – MIT Neutrino & Dark Matter Group Undergrad researcher Jan. 2019 - May 2019

- Modeled behavior of magnetic shielding material for the ABRACADABRA axion detector
- Maintained and machined components for the detector's dilution refrigerator

Thomas Jefferson National Accelerator Facility Undergrad researcher June 2018 - Aug. 2018

- Constructed scintillator bar and photomultiplier modules for BAND
- Assembled and installed BAND and its electronics in Jefferson Lab Hall B
- Set up data acquisition and analysis software suite for BAND

MITRE Quantum Information Group Research intern Feb. 2017 - June 2017

- Verified operation of InGaAs single photon detectors
- Configured electronics to measure Bell pair entanglement for optical quantum computing

Leadership

MIT Society of Physics Students Outreach Chair, President May 2018 - present

- Interface between department and students on issues such as mentorship and equity/inclusion.
- Organized Boston-area undergraduate conference, regular faculty dinners, outreach efforts, etc.

MIT Shakespeare Ensemble Actor, Producer, Publicity Designer Sept. 2017 - present

- Participated in twelve student-run productions in various roles
- Managed a crew of twenty people as a producer (*Rumors*, 2019) and oversaw six tech departments
- Managed a cast, writers' team, and crew (20+ people) as a showrunner (*No Right Angles*, 2020)

HackMIT Organizing Team Marketing Director Sept. 2017 - May 2019

- Organized HackMIT, MIT's largest hackathon, run by 30 students for over 1300 participants
- Successfully managed six-person design team and developed event identity and branding assets
- Organized Blueprint 2018 and 2019, weekend-long hackathons for 250 high school students

Activities

- MIT Associate Advisor and 2020 PhysPOP Counselor
- MITVote - volunteer for 2020 Get Out The Vote efforts
- MIT Undergraduate Association - Marketing Committee vice-chair, 2018-2019
- MIT South Asian Association of Students - board member, 2017-2019
- MIT Undergraduate Research Journal - copy and layout editor for Fall 2017 and Spring 2018 issues

Teaching

MIT Educational Studies Program Teacher (Spark, Splash, HSSP) 2018 - present

- 4 one-hour sessions on relativity and black holes ("Black Holes!") for over 150 students
- 2 one-hour sessions on the Standard Model ("The Standard Model!") for 50 students
- 7 one-hour sessions on quantum computing ("Quantum Computing!") for 60 students
- 6 one-hour sessions on the history of science ("History of 20th Century Science") for 30 students

MIT Physics Department Grader and tutor 2018 - present

Graded weekly problem sets for one semester of Physics III, one semester of Statistical Mechanics, one semester of Relativity, and one semester of Quantum Physics I. Tutored Physics III student for one semester.

Selected Awards

Cathy M. Comeau UROP Researcher Awarded to women in science research at MIT Spring 2020

January Scholars in France (Paris, France) Awarded for excellence in French Studies Jan. 2020

Burchard Scholar Awarded for excellence in the humanities at MIT 2019

Presenter at APS Division of Nuclear Physics yearly meeting Awarded travel grant Oct. 2018

International Linguistics Olympiad Team USA Alternate Jun. 2016

Publications

The CLAS12 Backward Angle Neutron Detector (BAND) arXiv:2004.10339

E.P. Segarra, F. Hauenstein, A. Schmidt, A. Beck, S. May-Tal Beck, R. Cruz-Torres, A. Denniston, A. Hrnjic, T. Kutz, **A. Nambrath**, et al.

Laser Calibration System for Time of Flight Scintillator Arrays Nucl. Inst. Methods A 973 (2020)

A. Denniston, E.P. Segarra, A. Schmidt, A. Beck, S. May-Tal Beck, R. Cruz-Torres, F. Hauenstein, A. Hrnjic, T. Kutz, **A. Nambrath**, et al.

Electron Beam Energy Reconstruction for Neutrino Oscillation Measurements in prep.

M. Khachatryan, A. Papadopolou, A. Ashkenazi, F. Hauenstein, **A. Nambrath**, et al.

Skills

Python, C++/ROOT, Numpy/PyTorch, LaTeX, French, Malayalam, Sanskrit, Adobe Photoshop/Illustrator