Anjali Nambrath

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Education

Massachusetts Institute of Technology May 2021
B.S. in Physics & Mathematics, Minor in French. GPA: 4.8/5.0

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

Research Experience

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

- 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 in BAND

Fermi National Accelerator Laboratory Research intern (SULI program) 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

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 ABRACADABRA 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

Leadership

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

- Working with department leadership on issues such as advising, inclusion, instruction, and community
- Organized two undergraduate conferences, monthly faculty dinners, student town halls, and joint events with Harvard SPS.

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

- Participated in eleven student-run productions in various roles
- Managed a crew of twenty people as a producer (*Rumors*, 2019) and oversaw six tech departments

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

On-campus service

- MIT OpenCourseWare Advisory Committee - appointed undergraduate member, 2020-present
- MIT Physics Values Committee - undergraduate member, 2020-present
- MIT Associate Advisor to four first-years, 2020-present
- MIT Physics Pre-Orientation Program counselor, 2020
- MIT Undergraduate Women in Physics - board member, 2019 - present
- MITVote - volunteer for 2020 Get Out The Vote efforts
- MIT Undergraduate Association - Marketing Committee vice-chair, 2018-2019
- MIT Undergraduate Research Journal - copy and layout editor, 2017-2018

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
- 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 Mathematics Department Undergraduate teaching assistant 2020 - present

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.

MIT Physics Department Grader and tutor 2018 - 2020

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.

Publications, presentations, and posters

Electron Beam Energy Reconstruction for Neutrino Oscillation Measurements (submitted)
M. Khachatryan, A. Papadopoulou, A. Ashkenazi, F. Hauenstein, **A. Nambrath**, et al.

Benchmarking neutrino energy reconstruction with electron-deuterium scattering APS DNP 2020
A. Nambrath, D. Nguyen, A. Papadopoulou, L. Weinstein, O. Hen

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.

The CLAS12 Backward Angle Neutron Detector (BAND) Nucl. Inst. Methods A 978 (2020)
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.

Neutrons, Nuclei, and Neutrinos: Two-ish Years in MIT Physics MIT Family Weekend (2019)
Invited by the department to give a general talk about my research in physics at MIT.

Studying the use of e- data for DUNE energy reconstruction SULI poster session (2019)
A. Nambrath, M. Betancourt

Testing and constructing BAND, a backward angle neutron detector APS DNP 2018
A. Nambrath et al.