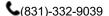
Md Nafiz Amin









Objective

Optics and photonics researcher with 6+ years of hands-on experience in experimental photonics. photonic design, optics, and imaging systems. Seeking challenging projects in photonics design and testing, product development, and AI in photonics. Expected Graduation- August 2024.

Skills

Lab Skills: Passive component testing, Imaging systems, Optical fibers, waveguides, lab

> equipment- class 3B and class 4 laser, tunable supercontinuum and Ti:Sapphire cavity lasers, interferometer, spectrum analyzers, wave meter, photo detectors, tunable filters, attenuator, combiners/splitters, power meter.

Optics Skills: Mode propagation, beam optics, ray optics, adaptive optics.

Material characterization: AFM, SEM, FIB milling, e-beam evaporation, ion etching, UV lithography

Simulation: Fimmwave, OmniSim, COMSOL Multiphysics, Lumerical, OSLO (free

alternative to Zemax, beginner level)

Design Tools: Autodesk Fusion360, SolidWorks.

Programming: Python, MATLAB, C/C++, NI LabVIEW, C#, JMP, HTML.

Technical Knowledge: semiconductor physics (2 classes), semiconductor processes (3 grad

classes), photonics and optical fiber (2 grad classes), optics and imaging (1

grad class)

Work Experience

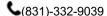
University of California, Santa Cruz

Graduate Student Researcher, ECE Department

Santa Cruz, California September 2017 - present

- Lab automation for Integrated Spectrometer- Developed a novel deep-learning-based integrated imaging spectrometer using multimode interference (MMI) waveguides in the Vis-NIR spectrum.
 - Designed, implemented, and maintained multiple test setups involving laser (LabVIEW) camera (C++) - spectrum analyzer (python) communication (TCP) architecture for equipment automation and remote control of high-speed optical acquisition setup.
 - Co-developed a deep learning (TensorFlow) framework for image-to-spectrum prediction.
 - Developed low-light imaging techniques for astronomy applications.
- Optical wafer characterization- Performed hands-on optical characterization, testing and validation experiments of optofluidic biosensors.
 - Performed the optomechanical alignment and troubleshooting of the related optical equipment.
 - Performed sample preparation and optical measurements, data analysis, and result statistics.
- Optical component design- Performed numerical simulations for optimization of waveguide spectrometers, planar multi-splitter waveguides and surface grating couplers for biosensing.
 - Performed waveguide design analysis using eigenmode solvers, FDTD, FDM etc. algorithms.
 - Performed passive optical component design, optimization, and performance analysis.
 - Worked on Photonic Crystal Fiber Design using FEM in COMSOL Multiphysics for undergraduate thesis.
- Waveguide gluing- Initiated and collaborated on a project for glued bonding between single-mode optical fiber and the edge-coupled photonic waveguides on a 3D printed stage.
 - Developed a UV in-fiber delivery and monitoring process for slow curing of the optical bonding glue. This idea shares similar concepts to photonic wire bonding.
 - Successfully transported and tested a fiber-coupled waveguide from the UCSC lab to the Lick observatory. The long-term goal is photonics packaging in the lab and on-site implementation.

Md Nafiz Amin



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- **Optofluidic biosensor** Designed an integrated, free-space optofluidic biosensor by thin metal film evaporation on an antiresonant (ARROW) semiconductor waveguide.
 - Designed a top-down fluorescence laser excitation scheme for flowing biomolecule detection.
 - Built multiple epi-illumination microscope systems.
- **Astrophotonics** Collaborated in experiments at Lick Observatory (San Jose, CA) to integrate a photonic spectrometer module with the 120-inch Shane telescope.
 - Collaborated with astronomers and UC observatory engineers in integrating photonic testbeds on the telescope's adaptive optics system.

City University, Bangladesh

Dhaka, Bangladesh

Lecturer, Dept. of EEE

December 2016 - July 2017

• Instructed courses in- a) Optical Fiber Communications, and b) Signals and systems.

Grameenphone Ltd.

Dhaka, Bangladesh

Senior System Engineer, Circuit Switching System (CSS)

September 2016 - December 2016

- Operation and maintenance support of Grameenphone's 2G/3G Voice Core Network nodes.
 - Collaborated with multiple teams involving electrical engineers, process engineers, test engineers, operations engineers, and external technology vendors.

Management Trainee, Next Business Leader (NBL) program

September 2015 - August 2016

• To understand project management and the overall workflow of a telecommunications company.

Education

University of California, Santa Cruz - Ph.D., Electrical Engineering

Santa Cruz, California

Research area: Photonic spectrometer & optofluidic biosensor

September 2017- present

Advisor: Prof. Holger Schmidt

Expected Graduation: August 2024

University of California, Santa Cruz - M.S., Electrical Engineering

September 2017 - June 2022

Bangladesh University of Engineering and Technology - B.Sc.

May 2010 - September 2015

Electrical and Electronic Engineering

Dhaka, Bangladesh

Publications highlights

(Full list- Please visit the Google Scholar profile link above)

- M. N. Amin *et al.*, "Multi-mode interference waveguide chip-scale spectrometer", manuscript submitted, another article in progress.
- M. N. Amin et al., "Free-Space Excitation of Optofluidic Devices for Pattern-Based Single Particle Detection," IEEE Photonics Technology Letters, vol. 33, no. 16, pp. 884-88, 2021.
- M. N. Amin et al., "Highly nonlinear polarization-maintaining photonic crystal fiber with nanoscale GaP strips," Applied Optics, vol. 55 no. 35, pp. 10030-10037, 2016.

Awards and Activities

- Recipient of the IEEE Photonics Conference 2019 travel grant, CLEO 2023 travel grant.
- Recipient of the Regents Fellowship for incoming doctoral students at UC Santa Cruz.
- Member of SPIE, OSA, and IEEE Photonics Society.