Ijaas Mohamed

Email : mohamed.769@buckeyemail.osu.edu

Mobile : +1-614-360-4571

E-mail: ijasmuhammed98@gmail.com

Education

- **The Ohio State University** — Columbus, United States
  Ph.D in Electrical and Computer Engineering; GPA: 4/4 — *Aug 2024 - Present*
- **Ghent University** — Ghent, Belgium
  M.Sc in Photonics Engineering; Grade: Magna Cum Laude (753/100) — *Sept 2022 - July 2024*
- **Indian Institute of Science Education and Research Bhopal (IISER-B)** — Bhopal, India
  B.S - M.S (Dual Degree) in Physics; GPA: 8.64/10 — *Aug 2017 - July 2022*

Research Experience

- **Ghent University (IMEC group)** — Ghent, Belgium
  M.Sc thesis, Advisor: Prof. Geert Morthier — *September 2023 - Present*
  - Investigating the feedback sensitivity of heterogeneously integrated III-V on-Si DBR lasers. Design-modelling of optical isolator free III-V on Si DBR lasers for telecom C-band and fabrication DBR laser diodes with passives waveguides and Bragg gratings on Si with integration of AlGaInAs MQW gain stack to 400nm Silicon on Insulator (SOI) platform using μ-transfer printing.
- **Paul Drude Institute of Solid State Electronics (PDI)** — Berlin, Germany
  Research intern, Advisors: Dr. Oliver Brandt & Dr. Lutz Geelhar — *July 2023 - September 2023*
  - Investigation of optical properties of top-down fabricated InGaN nanowires (NW) from layers grown by molecular beam epitaxy (MBE), using Spectroscopic ellipsometry, micro photoluminescence (μ-PL), reflectance-transmittance measurements. Gained basic understanding in the growth of InGaN/GaN layers by plasma-assisted MBE. Numerical simulations using Lumerical FDTD & FDE to predict the absorptance and supported guided and resonant leaky modes in the GaAs NWs and InGaN NWs.
- **Indian Institute of Science Education and Research Bhopal (IISER-B)** — Bhopal, India
  M.S Thesis, Advisor : Prof. K.V.Adarsh, Dept of Physics — *September 2021 - April 2022*
  - Quantification of third order nonlinear optical response of 2D transition metal dichalcogenides $Re_yS_{2(1-x)}Se_{2x}$ nanoflakes for optical limiting. Investigated nonlinear absorption using Nanosecond laser-pumped Z-Scan technique. Liquid phase exfoliation of $Re_yS_{2(1-x)}Se_{2x}$ nanoflakes from bulk and structural characterization using XRD, SEM and Raman spectroscopy.
- **Indian Institute of Technology Bombay (IIT-B)** — Mumbai, India
  Research intern, Advisor: Prof.Anil Kottantharayil, Dept of Electrical Engineering — *June 2021 - August 2021*
  - Optical simulations of different textured & planar anti-reflective coatings in c-Si solar cells to study the light trapping effect using Transfer matrix method (TMM) and Rigourous coupled wave analysis (RCWA) with *RayFlare* package and electrical modeling for I-V characteristics using *SOLCORE* package in Python (Remotely due to covid restrictions)
- **Indian Institute of Science (IISc) Banglore** — Bengaluru, India
  Research intern, Advisor: Dr.Subho Dasgupta, Dept of Materials Engineering — *June 2019 - August 2019, & Dec 2019*
  - Fabrication of inkjet printed ferroelectric field effect transistor (FeFET), followed by electrical characterization. Synthesised and optimized the Ag, Cu_2O, PVDF-TrFE, CSPE, In_2O_3 inks for printing
- **Cochin University of Science and Technology (CUSAT)** — Kochi, India
  Research intern, Advisor: Prof.M.K.Jayaraj, Dept of Physics — *June 2018 - August 2018*
  - Optimising the deposition of p-type Cu_2O thin films by RF-Magnetron sputtering. Fabrication and I-V characterization of p-type oxide Thin film transistors(TFT).

Publications

- Marín, F.; **Mohamed, I.**; Brandt, O.; Geelhaar, L. Diameter Dependence of Light Absorption in GaAs Nanowires Evidenced by Photoluminescence Spectroscopy. *Advanced Optical Materials* 2025. https://doi.org/10.1002/adom.202503215

Conferences

- Top-down (In,Ga)N nanowires fabricated from molecular beam epitaxial layers with high structural perfection *J. Kang, M. Gómez Ruiz, D.V. Dinh, A. Campbell, A. Trampert,* ***I. Mohamed****, M. Oliva, P. John, J. Lähnemann, T. Auzelle, O. Brandt, and L. Geelhaar*, at *14th International Conference on Nitride Semiconductors (ICNS-14)*, Fukuoka, Japan (Nov. 12-17, 2023). - *poster*

Skills Summary

- **Languages** Python, C
- **Cleanroom tools** Photolithography (Maskaligner and Maskless direct write), RIE-ICP (dry etch), PECVD, ebeam evaporation, Thermal Evaporation, RF-Magnetron Sputtering, Wet etching
- **Material characterization** XRD, SEM, Profilometry, Ellipsometry
- **Softwares/Packages** Silvaco, Lumerical, Nextnano, KLayout, VESTA, IPKISS, Mathematica, MATLAB, LabView, OriginPro

Academic Projects

- **CMOS compatible SiGe QW Electroabsorption modulators** Design of SiGe quantum confined stark effect based electroabsorption modulators operating in telecom C-band and O-band using k· p theory calculations.*Advisor : Prof.Dries Van Thourhout* (2024)
- **Fabrication of phase shifters for Si photonic integrated circuits** Development of full process flow and fabrication of Ti based heaters as phase shifters for Si PICs on 220nm Silicon-on-Insulator platform.*Advisor : Prof.Gunther Roelkens* (2023-2024)
- **Microring resonators for biosensing on Si PICs** - Design, simulation, and characterization of cross coupled double ring resonator fabricated on Si on Insulator (SOI) platform for biosensing. *Advisor : Prof.Wim Bogaerts* (2023)
- **Nanoimprint lithography** Fabrication of polymer waveguides on PET using Nanoimprint lithography. *Advisor : Prof.Geert Van Steenberge* (2023)
- **Electromigration in thin films** Effect of AC on current-induced mass flow in Cr thin films. *Advisor : Dr.Santanu Taulkder* (2018)

Achievements

- Awarded **University Fellowship** of College of Engineering from Graduate School at The Ohio State University for first year of doctoral studies
- Cleared **Graduate aptitude test in Engineering (GATE) - Physics (PH)** 2022 conducted by IITs for admission to masters/doctoral programs at IITs/IISc/IISERs

Extra curricular

- Core-team member and Web developer at Computing & Networking Council (CNC) at IISER-Bhopal. Responsibilities - Development and maintenance of student activity council website, students.iiserb server, technical support for other student councils at the institute. Other related activities:
  - Core-committee member of Armageddon 2020, Annual e-gaming fest at IISERB
  - Graphic designer at Singularity 2019, Annual Techno-Science Fest IISER-B
- Active contributor to bird census, bird conversation activities of Cochin Natural History Society (CNHS), Kochi-India. Contributed to one of the publications *(Kerala Bird Atlas 2015–20: features, outcomes and implications of a citizen-science project)* resulting from a study carried out to map the bird distribution in the state of Kerala, India. Other related activities: Bird photography, bird acoustics - contributed to e-Bird and Macaulay Library (Database from Cornell Lab of Ornithology)