

Mohan Giri

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Education

Ph.D., Physics	(Expected) 2025
Baylor University, Waco, Texas, USA	
M.A., Physics	2025
Baylor University, Waco, Texas, USA	
M.S., Physics	2015
University Campus, Tribhuvan University, Kathmandu, Nepal	
B.Sc., Physics, Chemistry, Mathematics	2011
Tri-Chandra Multiple College, Tribhuvan University, Kathmandu, Nepal	

Skills and Experiences

Within Condensed Matter Physics, I specialize in characterizing the electronic and optical Properties of Semiconductors, Superconductors, 2DEG, and Oxytellurides.

Laboratory-Based

- **Semiconductors:** Developement of experimental setups—infrared pump-terahertz probe spectroscopy—for studying carrier dynamics and relaxation mechanisms in semiconductors.
- **Superconductors:** Constructing THz-Time Domain Spectroscopy system to study superconductor optical properties, including conductivity, refractive index, dielectric constant, critical temperature, superconducting gap, penetration depth.
- **2DEG:** Performing cyclotron resonance measurements at mK temperatures to study electron mobilities in 2DEG.
- **Oxytellurides:** Setting up Raman Spectroscopy to study structural and vibrational properties of Oxytellurides, including La_2TeO_2 , La_2TeO_6 , and Pr_2TeO_6 .

Equipment-Based

- **Laser Systems:** Alignment and operation of Spectra Physics laser amplifier (Solstice Ace), oscillator (Tsunami), and Optical Parametric Amplifier (TOPAS).
- **Cryogenic Systems:** Expertise with Bluefors dilution refrigerators (7mK, 7T), ARS cryostat (4K), and Janis cryostat.

- **Other:** Spectrometer, powermeter, optical chopper, lock-in amplifier, delay stage, PMT; techniques include auto-correlation, FROG, 2D THz spectroscopy, FTIR, second/third harmonic generation.

Computer-Based

- **Ab-initio (DFT) Calculation:** Electronic and optical properties using QUANTUM ESPRESSO.
- **Programming:** Python, LabVIEW, Mathematica, MATLAB, FORTRAN, LaTeX.
- **Design Tools:** 2D/3D design with CAD, TinkerCad, Fusion 360.
- **Data Analysis:** Python libraries (Pandas, NumPy, SciPy, SymPy), visualization (Seaborn, Matplotlib).
- **Machine Learning:** Linear regression, classification (Scikit-learn), neural networks (TensorFlow, PyTorch).

Selected Publications and Manuscripts

- **Under Preparation:** Carrier dynamics and fluence-dependent ultrafast dynamics of ErAs:GaAsBi using IR pump-THz probe spectroscopy; THz spectroscopy in dilution refrigerator and FeSe thin films; system energies for pentaquark family.
- **Peer-Reviewed:** Giri M, Baral S, Kaphile GC, et al. Investigation of quark distributions in a family of pentaquarks using the Thomas-Fermi quark model. *Communications in Theoretical Physics* 2021; 73(3):035202. [doi:10.1088/1572-9494/abd0a4](https://doi.org/10.1088/1572-9494/abd0a4).

Key Research Projects

- Cyclotron resonance experiment to measure electron mobilities in 2D electron gas (GaAs quantum wells), Baylor University.
- THz-Time Domain Spectroscopy to study optical properties of GdScO₃, Baylor University.
- Terahertz spectroscopy of Dirac semimetal SrIrO₃, Baylor University.
- Development of Raman Spectrometer from scratch, Baylor University.
- Thomas-Fermi Quark Model for degenerate and non-degenerate mesonic matter, EVIST Collaboration.

Teaching and Mentorship Experience

- **2021–Present:** Training undergraduate and graduate students in experimentation, data analysis, and interpretation, Hilton Lab, Baylor University, Waco, Texas.
- **2021–Present:** Graduate Teaching Assistant, Physics, Baylor University, Waco, Texas.

- **2020–2021:** Physics Instructor, Siddhi Ganesh Higher Secondary School, Sindhupalchowk, Nepal.
- **2018–2020:** High School Science and Mathematics Instructor, Various High Schools, Kathmandu, Nepal.
- **2016–Present:** Research Mentor, Everest Institute of Science and Technology (EVIST), Kathmandu, Nepal.
- **2016–2018:** Computational Mentor, Central Department of Physics, Tribhuvan University, Kathmandu, Nepal.

Awards

- Travel Award for Global Physics Summit, Graduate School, Baylor University, 2025.
- Travel Award for APS March Meeting, Graduate School, Baylor University, 2024.
- Full Tuition Scholarship/Graduate Assistantship, Department of Physics, Baylor University, 2020–Present.
- Best Mathematics Teacher, Chanakya School, 2020.
- Best Science Teacher, Vedic School, 2019
- Best Trainee Business Officer of the year 2014, Qmed Pharmaceuticals, 2014.

Professional Affiliations

- Member, American Physical Society (APS).
- Member, National Science and Research Society (NSRS).
- Researcher, Everest Institute of Science and Technology (EVIST).

References

Available upon request.