# Nitin Negi

PhD Student, Imaging Science
Rochester Institute of Technology
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## RESEARCH EXPERIENCE

**PhD Research, Rochester Institute of Technology** 2025–Present
Advisor: Dr. Benjamin Chin

- Investigating whether microfluctuations in ocular accommodation serve as directional cues for the accommodation response.
- Studying the role of chromatic and optical cues in accommodation using experimental and computational approaches.
- Developing analysis pipelines in Python and MATLAB for time-series processing, Fourier analysis, and wavefront-based measurements.
- Working with optical system design and vision-science instrumentation relevant to Badal optometer based experiments.

**Master's Thesis: Generalized Lens using Gradient Based Optimization** 2024–2025
Indian Institute of Technology Delhi
Supervisor: Prof. Kedar B. Khare

- Analyzed the performance of a phase mask designed for spatial separation of orbital angular momentum (OAM) modes.
- Developed a physics-informed optimization pipeline using PyTorch to refine the phase mask design.
- Performed numerical simulations using Fourier optics and angular spectrum propagation methods.
- Designed custom loss functions and applied gradient-based optimization techniques to improve sorting efficiency for closely spaced OAM modes.
- Studied the effect of propagation distance on spatial separation and efficiency after phase-mask interaction.

## PRESENTATIONS & POSTERS

Negi, N., and Chin, B. "Microfluctuations in Ocular Accommodation Across Target Distance and Light Spectrum." *Vision Sciences Society Annual Meeting*, St. Pete Beach, FL, May 2026. *(Poster, upcoming)*

## TEACHING EXPERIENCE

**Graduate Teaching Assistant**, Rochester Institute of Technology 2025–2026
Courses: Geometric Optics; Linear & Fourier Methods for Imaging

**Teaching Assistant**, Applied Optics Laboratory 2024
Indian Institute of Technology Delhi

## TECHNICAL SKILLS

**Programming:** Python, MATLAB

**Libraries and Tools:** NumPy, SciPy, Pandas, Matplotlib, PyTorch

**Optics & Scientific Methods:** Fourier optics simulation, signal processing, Zemax, ISETBio

**Experimental:** Spatial filtering, lateral shearing interferometry, Michelson interferometer, Fabry–Perot interferometer, Abbe refractometer

**Documentation and Workflow:** LaTeX, Overleaf, MS Office, Git, GitHub

## EDUCATION

**PhD in Imaging Science** 2025–Present
Rochester Institute of Technology, Rochester, NY, USA
Advisor: Prof. Benjamin Chin

**Master of Technology (M.Tech.) in Applied Optics** 2023–2025
Indian Institute of Technology Delhi, India
CGPA: 9.118/10

**M.Sc. in Physics | B.Sc. in Physics, Chemistry & Mathematics** 2015–2020
Hemvati Nandan Bahuguna Garhwal University, India

## AWARDS AND ACHIEVEMENTS

- Graduate Aptitude Test in Engineering (GATE), Physics – AIR 774 (top ∼4%, 2023).
- DST INSPIRE Scholar – Scholarship for Higher Education (SHE), Department of Science and Technology, Government of India.

## RELEVANT COURSEWORK

**Rochester Institute of Technology:** The Human Visual System; Image Processing & DF Methods; Radiometry; Computer Vision; Noise and System Modeling

**IIT Delhi:** Fourier Optics and Holography; Statistical Optics; Optical Systems Design; Computational Optical Imaging; Computational Optics Laboratory; Basic Optics and Optical Instrumentation; Optics and Lasers; Laser Systems and Applications; Optical Fabrication and Metrology