Placement Brochure 2025-26

Photonics Science and Engineering Program (PSE)

Centre for Lasers and Photonics(CELP),

Indian Institute of Technology Kanpur

Visit our website

About Us

The Center for Lasers and Photonics (CELP) at IIT Kanpur is an interdisciplinary center of excellence that integrates cutting-edge advances in engineering, physics, and computational science to push the frontiers of Photonics Science and Engineering (PSE). CELP bridges the gap between theory and application, with a focus on developing innovative solutions that span a broad range of domains—including optoelectronics, integrated photonic systems, high-speed communication, quantum technologies, and AI-assisted photonic design.

CELP offers three postgraduate programs: MTech, M.S. (Research), and Ph.D. in Photonics Science and Engineering. These programs are uniquely structured to equip students with both theoretical depth and hands-on expertise in areas such as semiconductor optoelectronics, fiber optics, optical communication systems, photonic integrated circuits, signal processing, and machine learning applications in photonics and imaging.

Graduates from CELP are well-positioned in diverse sectors, including telecom, data networking, VLSI design, embedded systems, AI-driven imaging, fiber and quantum optics. They have contributed significantly as entrepreneurs, researchers, and technology leaders in organizations like ISRO, DRDO, C-DOT, Intel, Nvidia, Sterlite Technologies, and Qualcomm. With a strong foundation in electronics, communication systems, and computational modeling, the programs at CELP aim to develop the next generation of engineers and scientists capable of shaping the future of photonic and allied technologies.

Watch our Department's video

Welcome Message from the Head

Prof. Pradeep Kumar Krishnamurthy,
Head, PSE(CELP), IIT Kanpur

For the placement season 2025–26, we warmly invite industry leaders to recruit students from our department.

This is an excellent opportunity to engage with a highly skilled and multidisciplinary talent pool trained at the intersection of cutting-edge science and advanced engineering applications.The program is uniquely designed to equip students with a strong foundation in photonics, electronics, electrical engineering, and applied physics, while also emphasizing integration with software and hardware systems relevant to today's technology-driven industries.

Through a balanced curriculum and rigorous hands-on training, our students are prepared to address complex real-world challenges across sectors like telecommunications, VLSI, embedded systems, high-speed optics, and AI-enabled imaging. Our coursework is aligned with industry standards, and students gain practical exposure through industry-oriented projects carried out in our state-of-the-art laboratories. They develop not only strong technical skills but also critical thinking, adaptability, and a problem-solving mindset. We believe our students will add significant value to your organization and contribute meaningfully to your innovation goals.

Curriculum

Core Courses

- Introduction to Photonics(PSE601A)
- Principles of Lasers and Detectors(PSE602A): Generation, Amplification and Detection of light
- Numerical Methods in Optics(PSE603A)
- Photonic Systems and Applications(PSE604A): Lasing Systems, Mode Locking, Fiber Optics, Non-linear Optics
- Photonics Lab Techniques(PSE605A)
- Research in Photonics and Lasers(PSE606A)
- Special Topics in Photonics(PSE607A)

Department Electives

- Nanophotonics(EE798I)
- Semiconductor Optical Communication Devices(EE685)
- Fiber Optic Communication(EE684)
- Quantum and Wave Phenomena(EE683)
- Signal Processing for Optical Metrology(EE798X)
- Advanced Fiber-optic Communications(EE798U)
- Optical Coherent Imaging(EE620)
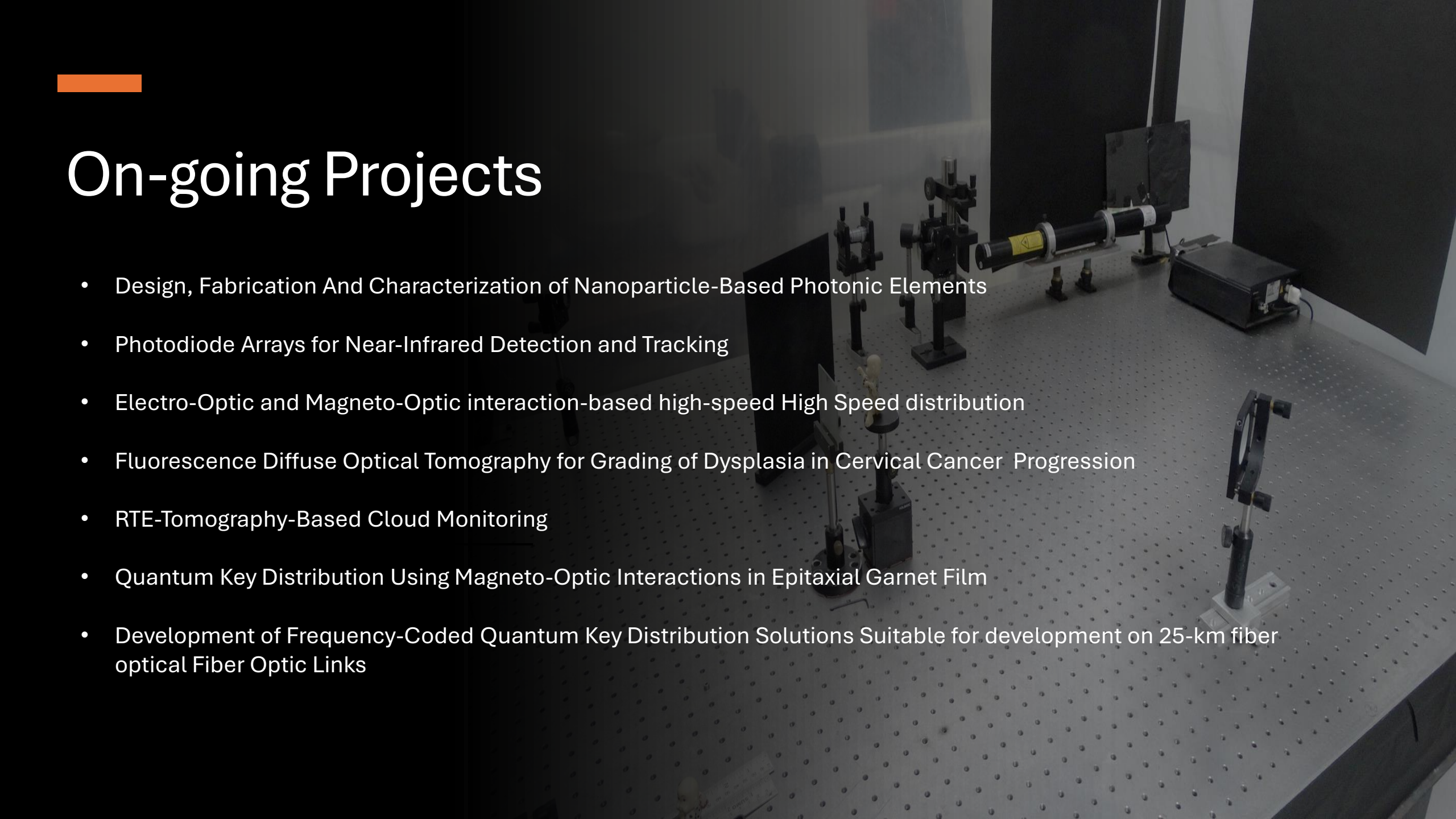- Kalman Filtering And Its Applications(EE657)
- Quantum Computing(CHM696)

Open Electives

- VLSI System Design(EE619)
- Mixed Signal IC Design(EE698I)
- Deep Learning For Computer Vision(CS776)
- Quantum Computing And Communication(EE798V)
- RFIC Design(EE698L)
- Analog/Digital VLSI Circuits(EE610)
- IC Fabrication Technology(EE618)
- Computer Vision and Deep Learning(EE655)
- 5G Wireless Technologies(EE698Q)
- Advanced Topics in Machine Learning(EE698R)
- High Frequency Analog Circuit Design(EE613)
- Parallel Computing(CS633)
- Atomic, Molecular & Optical Physics(PHY612)

On-going Projects

- Design, Fabrication And Characterization of Nanoparticle-Based Photonic Elements

- Photodiode Arrays for Near-Infrared Detection and Tracking

- Electro-Optic and Magneto-Optic interaction-based high-speed High Speed distribution

- Fluorescence Diffuse Optical Tomography for Grading of Dysplasia in Cervical Cancer Progression

- RTE-Tomography-Based Cloud Monitoring

- Quantum Key Distribution Using Magneto-Optic Interactions in Epitaxial Garnet Film

- Development of Frequency-Coded Quantum Key Distribution Solutions Suitable for development on 25-km fiber optical Fiber Optic Links

M.Tech Projects

Deep Learning based Fringe Analysis for Real-Time Optical Metrology *(Prof. G Rajshekhar)*
- Description: Develop Deep Learning models like Vision Transformers and GANs for fringe pattern normalization, denoising, and phase extraction for non - destructive testing (NDT) and flow visualizations. Using GPU-based parallel computing, we accelerate processing for real-time performance. These models are integrated into compact embedded systems, enabling low-cost, deployable optical metrology solutions.

FPGA implementation of fast hash function and oracles for quantum random number generators(*Prof. Pradeep Kumar*)
- Description: Focuses on FPGA implementation, directly related to digital hardware design, an essential area of VLSI. This project leverages FPGA for implementing functions beneficial to cryptographic applications

Design & analysis of Lock-in amplifier electronic circuit with Altium and FPGA*(Dr. S R Chanu)*
- Description: Involves circuit design, analysis, and application of a lock-in amplifier circuit using Altium and LT-Spice. The project also includes FPGA programming with Verilog, making it highly relevant to VLSI and digital design.

Machine learning models and experiments for long haul fiber-optic communication systems(*Prof. Pradeep Kumar*)
- Description: This project integrates machine learning with fiber-optic communication systems, which is a vital part of electrical engineering, especially in communications technology and data transmission.

M.Tech Projects

Electromagnetic Stealth for Defense Applications *(Prof. R Vijaya)*
- Description: This project involves micro-nano photonics, including simulation, fabrication, and testing, making it relevant to electrical engineering in electromagnetic design and signal processing

Photonic devices for quantum technology applications*(Prof. Shilpi Gupta*)

**Constructing a nano-viscometer with optical tweezers***(Prof. Debabrata Goswami)*
- Description: optical tweezers, enhanced sensitivity with fs laser tweezers

Laser flash photolysis study of career dynamics in perovskite *(Prof. Pratik Sen)*
- Description: This project is centered on carrier dynamics in perovskite materials, relevant for optoelectronics and semiconductor applications, which are fundamental areas of electrical engineering

LiDAR intensity simulation using learning for rain, fog, and snow weather conditions*(Prof. Bharat Lohani*)
- Description: Focused on LiDAR technology for autonomous systems, this project involves deep learning and signal processing, which are key electrical engineering areas in sensor technology and environmental signal processing
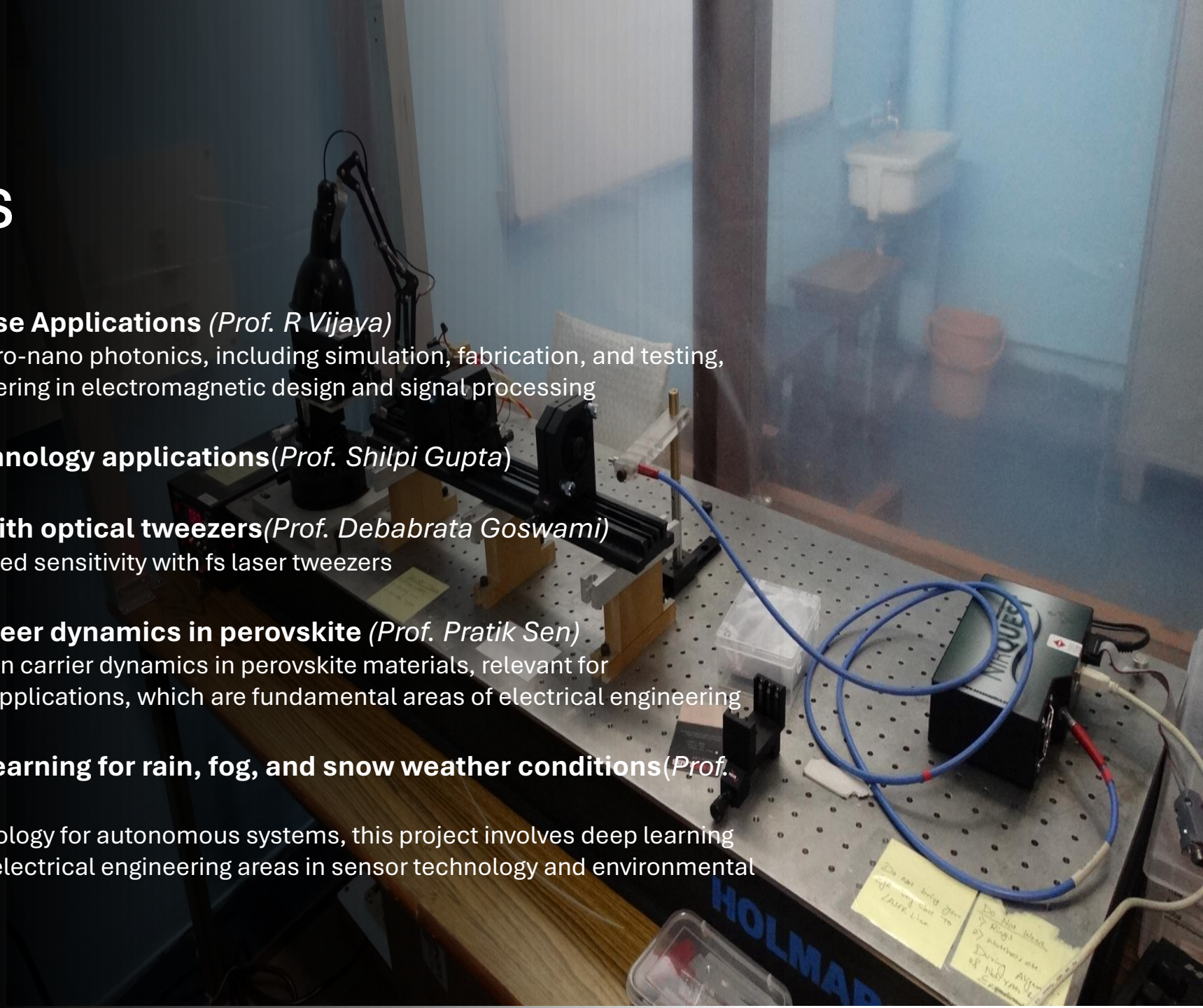
Lab Facilities

Opto-electronics and Nano-Fabrication Laboratory
- Multiquantum well Intermixed Waveguide Grating Assisted Couplers
- High Speed Waveguide Photodiodes
- Photodiode Arrays
- SiGeC/SiC Quantum Dash LEDs on silicon by spin-on technique
- Laser assisted vision through Fog

Optical Metrology and Imaging Lab

Cold ion Quantum Technologies Lab
- Quantum simulation
- Cold ion trapping
- FPGA based on Laser experiment

Optical Metrology and Imaging Laboratory
- Digital holography
- Machine learning algorithms for optical metrology
- High performance techniques

Photonics Devices Lab
- Flat devices
- Quantum Communications
- Non-Invasive Optical technology Flexible Photonics
- Opto-electronic devices

Opto-electronics and nano-fabrication Lab

Lab Facilities

Femto Lab
- Quantum Computing
- Pulse Shaping
- Optical Tweezers
- Thermal Lensing and Imaging

Laser Fabrication Lab
- High speed Flow Visualization
- Emission spectroscopy

Photonics Lab
- Photonics
- Nonlinear Optics Fiber Optics Photonic crystals
- Optical Nanostructures

Diffuse Image Laboratory
- Quantum Optics
- Non linear Optics
- Photonics Bandgap materials
- Metamaterials

Laser fabrication Lab

Femto Lab

Lab Facilities

Advanced Fiber and Quantum Optics and Quantum Key Distribution Laboratory
- Quantum cryptography
- Quantum optics
- Non-linear Optics

Femtosecond Laser Spectroscopy Laboratory
- fluorescence spectroscopy
- excited state photo physics and relaxation dynamics
- active-site protein dynamics

fs Laser Spectroscopy Lab

Microscale Transport Laboratory
- MICRO PIV/LIF
- Confocal Microscopy
- Digital Holography
- Laser/Color Schlieren
- PIV
- Interferometry
- Femtosecond Laser Microfabrication

Optical Instrumentation Lab
- Optical Techniques
- Flow control hierarchical porous medium

Microscale transport Lab

Our Alumni

Barada Kanta Nayak
M.Tech.(1999)
CEO at Spikewell

Aveek Dutta
M.Tech.(2007)
Scientist,
Government of India

G Rajshekhar
M.Tech.(2006)
Professor,
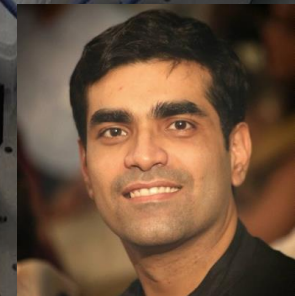Department of Electrical Engineering & CELP,
IIT Kanpur

Tripti Srivastava
M.Tech.(1994)
Chief TQM & CQA designate at Tata Steel
tripti.srivastava@tatasteel.com

Pankaj Dhar
M.Tech.(1990)
Founder and CEO at
A-Bioanalytics

Dr. Prasad Chaphekar
M.Tech.(1994)
Deputy Secretary, Ministry of New and Renewable Energy,
Government of India

Our Alumni

Mukund Anandan
M.Tech.(2013)
Tech Lead(Software) at Cisco

Lakshay Thukral
M.Tech.(2021)
Sr. ASIC Engineer at
NVIDIA

Aditya M.
M.Tech.(2021)
Multimedia Systems Engineer,
Qualcomm

Raju Ranjan
M.Tech.(2006)
Senior Consultant (AI) at
Datalens Technologies

Tarique Anwar
M.Tech.(2021)
Staff R&D Engineer Circuit Design &
Arch
Synopsys Inc

Suchismita Bose
M.Tech.(2021)
ASIC Engineer at
NVIDIA

Anup Lal Shah
M.Tech.(1990)
Scientist E.
LASTEC, DRDO

Narisetti Sundar Raju
M.Tech.(1999)
CTO at Spikewell

Prakash Sahu
M.Tech.(2007)
Assistant Design Engineer at
Mecon Limited, India

Find our alumni here

Top Recruiters

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