

**Name of the supervisor: Dr. Ashwini Kumar Sharma**

**Brief description of research:** Broadly speaking, my area of research is laser-matter interaction. It involves the interaction of pulsed laser in different environments (vacuum, gases, magnetic field) using various diagnostic techniques to study various properties of plasma (called laser-produced plasma). The plasma comprises of atoms, molecules, ions, clusters etc. and therefore is used for the deposition of various types of nanostructures. So far as these nanostructures are concerned, I am mostly interested in their optical properties which are characterized using various techniques available at the Central Instrument Facility (CIF) at IIT Guwahati. More details related to my work can be found in the link <https://www.iitg.ac.in/aksharma/>

**Possible projects for the new student:**

1. Pulsed laser ablation for plasma characterization in various ambient conditions.
2. Pulsed laser deposition of thin films/nanostructures for various optoelectronic applications.
3. 2D materials and transparent conducting oxides (multi-layered/heterostructures) and their applications.
4. Plasmonic materials for surface-plasmon based applications.