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Functional Materials and Opto-electronics Research Group (FORG) is in the early stage of establishing world class research facilities for carrying out research on chemistry of functional materials and investigate the physics of semiconductor materials for various applications. All these facilities of functional materials processing, their characterization, and various application setups are going to be available at Indian Institute of Technology Guwahati, India.

FORG's research focus is primarily on solution processed growth of nanocrystals, single crystals, inorganic metal-chalcogenide quantum dots, low dimensional perovskite analogues and corresponding theoretical crystal studies. The photophysical properties of the materials are investigated to understand their suitability or capability for various applications. Then, employment of these novel solution processed semiconductor layers as an active material in different devices in emerging technologies for light-emitting devices (LEDs), solar cells, detectors, sensors, and bioimaging applications.

Some of current research problems are as follows,

1. Synthesis of highly luminescent and stable metal halide perovskite nanocrystals,
2. Understanding the photophysical properties of perovskite materials and charge transfer mechanisms among different heterostructures,
3. Formation of flexible LEDs with high efficiency, stability and better color purity,
4. Perovskite materials for application in memistors,
5. Detection of different toxic metal ions in water and different biological cells,
6. Imaging of different biological cells with help of a fluorescent nanocrystals probe.