

## **Broad Area of Research**

### **Nanotechnology**

Design and engineering of methods/devices at molecular level that lead to compact and faster microprocessors with consumption of less energy. Smart and efficient products, efficient batteries and solar cells, targeted cure of many diseases like cancer are the few applications of this field. A discipline with all the ingredients to turn into the next industrial revolution.

### **Computational Physics**

Many important recent advances in our understanding of the physical world have been driven by large-scale computational modeling and data analysis. For an example, the plasmonic deals with the interaction of coherent free electrons with radiation. It helps in confining light at subwavelength scale and useful for enhancing photochemistry, biosensing, energy harvesting etc.

### **Photonics**

Photonics utilizes lasers, optics, imaging and more to impact every area of modern life, from communications and information processing to lighting, agriculture and medicine, manufacturing, transportation, aerospace and much more. Photonics is set to be the key technology for the 21st Century.

## **Astrophysics & Cosmology**

Studying Astrophysics and Cosmology helps us to understand the phenomenon that governs the behavior of astronomical objects, origin, evolution, composition, and fate of the Universe as a whole.

## **Nonlinear Dynamics**

This is one of the most important courses having applications in the field of nonlinear vibrations (MEMS, lasers), celestial mechanics (including planetary rings and rotations of celestial bodies), biodynamics (including interaction of populations of fireflies, flight of insects, and human walking) and control (including satellite dynamics and manufacturing processes)