NET Tomographic methods for measurements in multi-phase-flows (Dr. Prabhat Munshi)

Tomographic methods are used extensively in industry for nondestructive evaluation and non-invasive measurements in solids/liquids/gases/plasmas/multi-phase-flows. Current problems are related to theoretical, numerical and experimental aspects in various engineering and science applications".

NET Aerosol transport for nuclear safety (Dr. Sachchidanand Tripathi)

Aerosol transport behaviour under dry and wet condition in Primary Heat Transport system and containment is very active area of research from nuclear safety point of view. A whole range of related issues will be studied in upcoming National Aerosol Facility, first in India, using state of art aerosol and droplet instrumentation and numerical models.

NET X-ray phase contrast tomography (Dr. Naren Naik)

X-ray phase contrast tomography is a variant of conventional X-ray computed tomography (CT) that yields images with better soft tissue contrast where the phase shift of the X-rays passing through a sample are recorded and inverted to yield an estimate of the real part of the refractive index. This is of great interest in medical imaging since in addition to its improved soft-tissue contrast over conventional CT, it also offers the possibility of X-ray dose-reduction.It is proposed to investigate static and dynamic X-ray phase contrast algorithms and integrate them with actual beamline data.

NET Signal processing and radiation detection for portal monitors (Dr. Shikha Prasad)

Radiation portal monitors are used to check for the presence of radioactive substances to ensure national security at border crossings, ports of entry, and strategic locations. These portal monitors are designed with multiple detectors, typically scintillation detectors. Scintillation detectors are in turn connected to a photo multiplying device. The charge collected from these devices need to be processed together based on various attributes such as timing of the pulse, height of the pulse, the pulse integral etc. Signal processing algorithms need to be developed to first filter and retain only the correlated pulses, and then to combine them together to obtain a cumulative indicator for characterizing radioactive material.

NET Two-phase flow relevant to nuclear reactors (Dr. Pankaj Wahi)

Reduced order modeling of 1D two-phase flow relevant to nuclear reactors