Sushil Mujumdar completed his PhD in 2001 from the Raman Research Institute, Bangalore in the field of light propagation in passive and active random media. He followed up with postdoctoral research in coherent random lasing and near-field optics in LENS, Florence, University of Alberta, Canada, and ETH, Zurich. He has now set up a programme on Nano-optics and Mesoscopic Optics in TIFR, Mumbai.

**Research Description**

Our effort is directed at studying the transport of optical waves through media which have a variation in the refractive index over length scales comparable to the wavelength. These experiments mostly deal with radiation at or near visible wavelengths. The structure can be ordered, or disordered, or even a combination of both. While some parallels can be drawn with the propagation of electrons in crystals, there also exist significant differences. For example, light can experience amplification which leads to fascinating phenomena hitherto unpredicted by theoretical studies. The existence of sophisticated laser sources, light detectors, and nanofabrication techniques makes it possible to experimentally study even the most elusive of phenomena. We aim to study light propagation through such nanostructured media in a passive, active, dielectric or a metallic environment.

**Selected Publications**

A K Tiwari, R Uppu and S Mujumdar, Collective lasing from a linear array of dielectric microspheres with gain, Optics Express, 20, 6598 (2012).


R Uppu and S Mujumdar, Persistent coherent random lasing using resonant scatterers, Optics Express, 19, 23523-23531 (2011).


