

Santhi Ani Joseph was born in 1975. She received an M.Sc. in Physics (1998) with second rank and distinction from M G University, and then received a research fellowship from the Council of Scientific and Industrial Research, India, for doctoral studies and completed Ph.D. in Photonics (2006) from the International School of Photonics, Cochin University of science and Technology. Her PhD thesis is mainly about the nonlinear optical characterization of materials. However, it also illustrates some experimental schemes and results of photo thermal techniques in liquid media. This was done under the joint guidance of Prof. V P N Nampoori and Prof. P Radhakrishnan.

She was then awarded the University of Paris fellowship for post-doctoral research at the Institut de Chimie Moleculaire et Materiaux d'Orsay, University of Paris Sud, Orsay, France and another fellowship from the Inter University Attraction Pole of the European union at the Universite Libre de Brussels, Belgium for one year each. At Paris, the main topic of research was floating zone technique for **synthesize of metamaterials** and optical characterization and chemical analysis using electron microprobe. The main objective was to optimize various crystal growth parameters to obtain a metamaterial that could be used in the telecom wavelengths. Band gap engineering on these pseudo periodic crystals later provides **photonic crystals**. Another field of interest was **femtosecond laser writing** for waveguide fabrication in nonlinear materials and optical characterization and surface profiling using the phase shift interferometric technique. At **ULB** nonlinear optical studies on similar waveguides were carried out. Other topics were **Nonlinear fiber optics**, ultrafast phenomena, time resolved z-scan, modulational instability etc. and on the theoretical side, simulation for Dispersive-scan experiments for studying nonlinear properties of waveguides using the split step Fourier technique was given main emphasis.

Ok, so far about my biodata. Now about the teaching assignment at the International School of Photonics. It includes advanced Quantum mechanics for the Masters students and laser technology for the M.Techs. For the next semester, beginning in December, I will be handling nanophotonics. Projects (either mini project or the main project) that I plan to offer to the CELOS students and the M.Techs are :-

1. Modulational instability in optical fibers --- this is an interesting phenomena in which a CW beam breaks up into pulses, due to the nonlinearity of the fiber. This is one tool that enables wavelength conversion, frequency multiplexing and demultiplexing etc. Equal importance could be given to experimental and theoretical studies.
2. Femtosecond laser writing - waveguide fabrication and characterization. Experimental only. There is hardly any standard theory for this method :-)
3. Nonlinear optics - z-scan (like always) and D-scan. Experimental studies and theoretical simulation.