

CHAPTER 51  
TECHNOLOGY  
APPLIED PHYSICS

Doctoral Theses

476. KALRA (Yogita)  
**Photonic Band Gap Matrials : Theory and Device Applications.**  
Supervisor : Dr. R. K. Sinha  
Th 15214

*Abstract*

Deals with the investigation of photonic band gaps and the devices based on it namely couplers, polarization splitters and polarizers. Focuses on photonic band gap engineering, complete photonic band gap engineering and defect band gap engineering in various 2D photonic crystal structures. Further, the light guidance via two possible mechanisms in photonic crystal structures. Further, the light guidance via two possible mechanisms in photonic crystal structure has been explored to design various photonic crystal devices.

*Contents*

1. Photonic crystals : Molding the flow of light. 2. Photonic band gap engineering in 2D photonic crystals. 3. Photonic crystal waveguides and devices : An index guided effect. 4. Photonic band gap waveguides and devices. 5. Polarization splitters based on complete photonic band gap. 6. Defect engineering in photonic crystals : Design of PBG polarizers. 7. Summary and future scope. Bibliography.

477. SHRIVASTAVA (Vaibhav)  
**Electrical and Structural Investigations of Ca, La and Pb Substituted  $\text{SrBi}_2\text{Nb}_2\text{O}_9$  Ferroelectric Ceramic.**  
Supervisors : Dr. A. K. Jha and Prof. R. G. Mendiratta  
Th 15215

*Abstract*

Deals with relevant theoretical background regarding formulation of various parameters investigated for processing and characterization of ferroelectrics. The optimization of sintering condition for undoped  $\text{SrBi}_2\text{Nb}_2\text{O}_9$  and effects of lead doping on A-site in  $\text{SrBi}_2\text{Nb}_2\text{O}_9$  ceramic and discussed in detail. Also deals with the preparation and characterization of calcium doped  $\text{SrBi}_2\text{Nb}_2\text{O}_9$  ceramic to obtain an optimum amount of calcium.

*Contents*

1. Introduction. 2. Parameters investigated and experimental details. 3. Preparation and characterization of pure and Pb doped  $\text{SrBi}_2\text{Nb}_2\text{O}_9$  (SBN) ceramics. 4. Studies of lanthanum doping in  $\text{SrBi}_2\text{Nb}_2\text{O}_9$  (SBN) ceramics. 5. Effects of calcium doping in  $\text{SrBi}_2\text{Nb}_2\text{O}_9$  (SBN) ceramics. 6. Inferences and recommendations. Bibliography.