

NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

NPTEL Video Course - Electrical Engineering - NOC:Photonic Crystals: Fundamentals and Applications

Subject Co-ordinator - Prof. Debabrata Sikdar

Co-ordinating Institute - IIT - Guwahati

Sub-Titles - Available / Unavailable | MP3 Audio Lectures - Available / Unavailable

- Lecture 1 - Motivation and Introduction to Photonic Crystals
- Lecture 2 - Overview of Photonic Crystal technology
- Lecture 3 - Fundamentals of EM theory of Light
- Lecture 4 - Electromagnetic Properties of Materials
- Lecture 5 - Scaling Properties of Maxwell's Equations
- Lecture 6 - Electromagnetism as an Eigenvalue Problem
- Lecture 7 - Symmetries for Classification of EM Modes
- Lecture 8 - Real and Reciprocal lattices
- Lecture 9 - Photonic band Structure: Computation and Analysis
- Lecture 10 - Fundamentals of 1D Photonic Crystal
- Lecture 11 - Analysis and Engineering of 1D Photonic Band Structure
- Lecture 12 - Applications of 1D Photonic Crystal
- Lecture 13 - Fundamentals of 2D photonic crystals
- Lecture 14 - Analysis and Engineering of 2D Photonic Band Structure
- Lecture 15 - Applications of 2D photonic crystals
- Lecture 16 - Overview of different 3D Photonic Crystals
- Lecture 17 - Crystals with complete bandgap
- Lecture 18 - Applications of 2D and 3D photonic crystals
- Lecture 19 - Overview and Modelling of Periodic Dielectric Waveguides
- Lecture 20 - Point Defects in Periodic Dielectric Waveguides and Q-factors of Lossy Cavities
- Lecture 21 - Applications: Fiber Bragg Grating
- Lecture 22 - Overview of Photonic Crystal Slabs
- Lecture 23 - Different types of defects in Photonic Crystal Slabs
- Lecture 24 - Engineering High-Q resonant Cavity
- Lecture 25 - Overview of photonic crystal fibers
- Lecture 26 - Index-guiding photonic crystal fibers
- Lecture 27 - Band-gap guidance in Holey Fibers
- Lecture 28 - Overview of Bragg Fibers
- Lecture 29 - Losses in Hollow-core Fibers

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- Lecture 30 - Applications of Photonic Crystal Fibers
- Lecture 31 - Designing a mirror, waveguide, acavity
- Lecture 32 - Temporal Coupled Mode Theory: Fundamentals and Applications
- Lecture 33 - Waveguide Splitters, Non-linear Filters, and Bistability
- Lecture 34 - Unusual Refraction and Diffraction Effects
- Lecture 35 - Photonic Crystal Devices for Slow Wave Phenomena
- Lecture 36 - Next Generation Devices based on Photonic Crystals
- Lecture 37 - Simulation Demonstration of Topological Photonic Crystals Based Waveguides - Part 1
- Lecture 38 - Simulation Demonstration of Topological Photonic Crystals Based Waveguides - Part 2