NPTEL Video Course - Physics - NOC:Group Theory Methods in Physics

Subject Co-ordinator - Prof. Ramadevi

Co-ordinating Institute - IIT - Bombay

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

Lecture 30 - Molecular vibration normal modes
Lecture 31 - Molecular vibration modes using projection operator
Lecture 32 - Vibrational representation of character
Lecture 33 - Infrared Spectra and Raman Spectra
Lecture 34 - Introduction to continuous group
Lecture 35 - Generators of translational and rotational transformation
Lecture 36 - Generators of Lorentz transformation
Lecture 37 - Introduction to O(3) and SO(3) group
Lecture 38 - SO(n) and Lorentz group
Lecture 39 - Generalised orthogonal group and Lie algebra
Lecture 40 - Subalgebra of Lie algebra
Lecture 41 - gl(2,C) and sl(2,C) group
Lecture 42 - U(n) and SU(n) group
Lecture 43 - Symplectic group
Lecture 44 - SU(2) and SU(3) groups
Lecture 45 - Rank, weight and weight vector
Lecture 46 - Weight vector, root vector, comparison between SU(2) and SU(3) algebra
Lecture 47 - Root diagram, simple roots, adjoint representation
Lecture 48 - SU(2) sub-algebra, Dynkin diagrams
Lecture 49 - Fundamental weights, Young diagrams, dimension of irreducible representation
Lecture 50 - Young diagrams and tensor products
Lecture 51 - Tensor product, Wigner - Eckart theorem
Lecture 52 - Tensor product of irreducible representation 1
Lecture 53 - Tensor product of irreducible representation 2
Lecture 54 - Clebsch - Gordan coefficients
Lecture 55 - 1) Quadrupole moment tensor (Wigner-Eckart theorem) 2) Decimet Baryon wavefunction
Lecture 56 - Higher dimensional multiplets in the quark model
Lecture 57 - Symmetry breaking in continuous groups
Lecture 58 - Dynamical symmetry in hydrogen atom
Lecture 59 - Hydrogen atom energy spectrum and degeneracy using Runge-Lenz vector