

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

NPTEL Video Course - Physics - NOC:Introduction to Astrophysical Fluids

Subject Co-ordinator - Prof. Supratik Banerjee

Co-ordinating Institute - IIT - Kanpur

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

- Lecture 1 - General introduction
- Lecture 2 - Phase space and Liouville's theorem
- Lecture 3 - Collisionless Boltzmann equation
- Lecture 4 - Boltzmann equation for collisional system - I
- Lecture 5 - Boltzmann equation for collisional system - II
- Lecture 6 - Equilibrium distribution function - I
- Lecture 7 - Equilibrium distribution function - II
- Lecture 8 - Derivation of moment equations - I
- Lecture 9 - Derivation of moment equations - II
- Lecture 10 - Application of moment equations in collisionless systems
- Lecture 11 - Derivation of ideal fluid equations
- Lecture 12 - Macroscopic forces on an ideal fluid
- Lecture 13 - Properties of ideal fluid
- Lecture 14 - Kelvin's vorticity theorem
- Lecture 15 - Conservative form and invariants in ideal fluids
- Lecture 16 - Steady flow, streamlines and stream function
- Lecture 17 - Departure from Maxwellian distribution
- Lecture 18 - Derivation of real fluid equations
- Lecture 19 - Hydrostatics: Model of solar corona
- Lecture 20 - Stellar/solar wind
- Lecture 21 - Accretion disks - I
- Lecture 22 - A small digression: Newtonian fluids
- Lecture 23 - Accretion disk - II
- Lecture 24 - Weak perturbation in a compressible fluid: sound wave
- Lecture 25 - Effect of nonlinearity: shocks
- Lecture 26 - Supernova explosion and spherical blast waves - I
- Lecture 27 - Supernova explosion and spherical blast waves - II
- Lecture 28 - de Laval nozzle and extragalactic jets
- Lecture 29 - Convective instability and Schwarzschild stability criterion

Get DIGIMAT For High-Speed Video Streaming of NPTEL and Educational Video Courses in LAN

<http://www.digimat.in>

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

- Lecture 30 - Rayleigh Benard convection - I
- Lecture 31 - Rayleigh Benard convection - II
- Lecture 32 - Jeans instability
- Lecture 33 - Waves and instabilities in a two-fluid interface - I
- Lecture 34 - Waves and instabilities in a two-fluid interface - II
- Lecture 35 - Oscillations of stars
- Lecture 36 - Oscillation of stars (Continued...)
- Lecture 37 - Rotation in astrofluids and Rayleigh criterion
- Lecture 38 - Fluid dynamics in a rotating frame of reference
- Lecture 39 - Vorticity theorem in rotating frame and Taylor-Proudman theorem
- Lecture 40 - Effect of rotation on a self gravitating mass
- Lecture 41 - Effect of rotation in stars
- Lecture 42 - Introduction to Plasmas
- Lecture 43 - Description of Plasma
- Lecture 44 - Kinetic to fluid picture of plasmas
- Lecture 45 - MHD fluids: magnetic pressure, magnetic tension and plasma beta
- Lecture 46 - Inviscid invariants in MHD
- Lecture 47 - Inviscid invariants in MHD (Continued...)
- Lecture 48 - Elsasser variables in MHD
- Lecture 49 - Linear wave modes in MHD
- Lecture 50 - MHD in space plasmas
- Lecture 51 - Introduction to turbulence in fluids
- Lecture 52 - Richardson-Kolmogorov phenomenology of turbulence
- Lecture 53 - Turbulent diffusion
- Lecture 54 - Turbulent viscosity
- Lecture 55 - Turbulence in MHD fluids
- Lecture 56 - Introduction to astrophysical dynamos
- Lecture 57 - Anti-dynamo theorem and turbulent dynamos