

# PHYSICS

# TRANSPARENCIES

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## MECHANICS SERIES

- M1: The Vector Product  $A \times B$
- M2: Relative Motion and Galilean Transformations
- M3: Motion With Constant Velocity or Acceleration; Projectile Motion
- M4: Uniform Circular Motion
- M5: Work Done by a Uniform Force
- M6: Work Done by a Nonuniform Force
- M7: The Potential Energy Function
- M8: Special Cases of Potential Energy Functions
- M9: Internal and External Forces in a System of Particles
- M10: Elastic Collisions in One Dimension
- M11: Inelastic Collisions in One Dimension
- M12: Torque
- M13: Angular Momentum
- M14: The Motion of a Top
- M15: Circular Kepler Motion
- M16: General Kepler Motion
- M17: Two-Dimensional Simple Harmonic Motion
- M18: Lissajou Figures
- M19: Kinematics of a Fluid
- M20: Bernoulli's Theorem

## HEAT AND SOUND SERIES

- HS1: Transverse and Longitudinal Waves
- HS2: Wavefronts
- HS3: Standing Waves as Superpositions of Traveling Waves
- HS4: Fourier Synthesis of Square Wave
- HS5: Beats Between Waves
- HS6: Doppler Effect for Moving Source
- HS7: Doppler Effect for Moving Observer
- HS8: The Constant Volume Gas Thermometer
- HS9: Isothermal and Adiabatic Processes; The Carnot Cycle
- HS10: Maxwellian Distribution of Molecular Speeds

## ELECTRICITY AND MAGNETISM SERIES

- EM1: Electric Fields I
- EM2: Electric Fields II
- EM3: Electric Fields of Parallel Plates
- EM4: R-C Circuits
- EM5: Charges in a Magnetic Field
- EM6: Torque on a Loop
- EM7: Ampere's Law
- EM8: Solenoid
- EM9: Oscillating L-C Circuit
- EM10: Cavity Oscillations
- EM11: Plane Electromagnetic Waves
- EM12: Dipole Radiation

## OPTICS SERIES

- O1: Huygens' Principle
- O2: Spherical Mirrors
- O3: Spherical Surfaces
- O4: Thin Lenses
- O5: Two-Slit Interference
- O6: Multiple Slits
- O7: Single-Slit Diffraction
- O8: Double Refraction

## RELATIVITY

- MP1: The Michelson-Morley Experiment
- MP2: The Concept of Simultaneity in Special Relativity
- MP3: Time Dilatation in Special Relativity
- MP4: Length Contraction in Special Relativity
- MP5: The Synchronization of Clocks in Special Relativity

## QUANTUM ASPECTS OF RADIATION

- MP6: Planck Theory of Black Body Radiation
- MP7: The Compton Effect
- MP8: The Absorption of Radiation by Matter

## THE NUCLEAR ATOM

- MP9: Rutherford Scattering
- MP10: Differential Scattering Cross Section
- MP11: Bohr-Sommerfeld Model of the Atom
- MP12: The Energy Levels and Spectrum of Atomic Hydrogen

## QUANTUM MECHANICS

- MP13: Quantum Mechanical Wave Packets
- MP14: Bound States for a Particle in a Box or Harmonic Oscillator Potential
- MP15: Energy Levels for a Particle in a Square Potential Well
- MP16: One-Dimensional Scattering by a Square Potential; Quantum-Mechanical Tunneling

## ATOMIC THEORY

- MP17: Radial Wave Functions for the Hydrogen Atom
- MP18: Probability Densities for Angular Momentum Eigenstates
- MP19: The Stern-Gerlach Experiment
- MP20: L-S and j-j Coupling in Atomic Spectroscopy
- MP21: The Lande g-factor
- MP22: The Zeeman Effect

## STATISTICS OF PARTICLES


- MP23: Distribution Rules for Maxwell-Boltzmann, Bose-Einstein and Fermi-Dirac Statistics
- MP24: Distribution Functions for Maxwell-Boltzmann, Bose-Einstein and Fermi-Dirac Statistics

## MOLECULES

- MP25: Ionic Binding in Molecules
- MP26: Covalent Binding in Molecules
- MP27: Rotational and Vibrational Energy Levels in Molecules

## NUCLEI

- MP28: Nuclear Binding Energy and the Semi-Empirical Mass Formula
- MP29: Naturally Radioactive Isotopes
- MP30: The Nuclear Pairing Force; Nuclear Mass Parabolas
- MP31: The Nuclear Shell Model
- MP32: The Violation of the Law of Reflection Invariance (Nonconservation of Parity)

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