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Doppler Shift and Cerenkov Radiation; 4.8 Reflection and Transmission at an Interface; 4.9 A Spherical Mirror; 4.10 A Spherical Lens; 4.11 A Magnetic Quadrupole Lens System; 5. Gases and Fluid Flow; 5.1 The Atmosphere
5.2 An Ideal Gas Model in Two Dimensions 5.3 Maxwell-Boltzmann Distributions; 5.4 Fermi-Dirac and Bose-Einstein Distributions; 5.5 Chemical Potential, Bosons; 5.6 Chemical Potential, Fermions; 5.7 Critical Temperature for He; 5.8 Exact Fermion Chemical Potential; 5.9 Complex Variables and Flow; 5.10 Complex Variables and Airfoils; 5.11 Complex Variables and Sources of Flow; 5.12 Viscosity Model; 5.13 Transport and Viscosity; 5.14 Fluid Flow in a Pipe; 5.15 Heat and Diffusion; 6. Quantum Mechanics; 6.1 Preliminaries-Planck Distribution; 6.2 Bound States - Oscillating or Damped
6.3 Hydrogen Atom 6.4 Periodic Table - Ionization Potential and Atomic Radius; 6.5 Simple Harmonic Oscillator; 6.6 Other Force Laws; 6.7 Deep Square Well; 6.8 Shallow Square Well; 6.9 Wave Packets; 6.10 Numerical Solution for Bound States; 6.11 Scattering off a Potential Step; 6.12 Scattering Off a Potential Well or Barrier; 6.13 Wave Packet Scattering on a Well or Barrier; 6.14 Born Approximation - Scattering and Force Laws; 6.15 Spherical Harmonics - 3D; 6.16 Free Particle in 3D; 6.17 Radioactive Decay-Fitting; 7. Special and General Relativity; 7.1 Time Dilation; 7.2 Relativistic Travel
7.3 The Relativistic Rocket

| Sommario/riassunto | This book provides visualizations of many topics in general physics. The aim is to have an interactive MATLAB script wherein the user can vary parameters in a specific problem and then immediately see the outcome by way of dynamic "movies" of the response of the system in question. MATLAB tools are used throughout and the software scripts accompany the text in Symbolic Mathematics, Classical Mechanics, Electromagnetism, Waves and Optics, Gases and Fluid Flow, Quantum Mechanics, Special and General Relativity, and Astrophysics and Cosmology. The emphasis is on building up an intuition by runnin |