



## Nuclear Physics: A Course Given by Enrico Fermi at the University of Chicago

By Fermi, Enrico

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Summary: Chapter 1. Properties of Nuclei A. Isotope, Charts and Tables B. Packing Fraction and Binding Energy C. Liquid Drop Model 1. Semi-empirical mass formula 2. Isobaric behavior 3.  $\alpha$ -emission 4. Periodic shell structure D. Spin and Magnetic Dipole Moment E. Electric Quadrupole Moment F. Radioactivity and its Geological Aspects G. Measurement and Biological Aspects of Radioactivity Appendices 1. Magnetic Moment for Closed-shell-plus-one Nuclei 2. Electric Quadrupole Moment 3. Mass Correction for Neutron Excess Problems Chapter 2. Interaction of Radiation with Matter 1. Energy Loss by Charged Particles 2. Bohr formula 3. Electrons 4. Other particles 5. Other absorbers 6. Range 7. Polarization Effects 8. Nature of equation for  $-dE/dx$  9. Ionization of a gas 10. Radiation B. Scattering 1. Classical calculation for single scattering 2. Multiple scattering C. Passage of Electromagnetic Radiation through Matter 1. Photoelectric absorption 2. Compton scattering 3. Radiation loss by fast electrons 4. Pair formation 5. Cosmic ray showers 6. Summary Appendices 1, 2, 3. Multiple scattering 4. Momentum and pair creation References Chapter 3. Alpha Emission A. Rectangular Barrier B. Barrier of Arbitrary Shape C. Application...



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