



Geometric Mechanics: Pt. I: Dynamics and Symmetry (2nd Revised edition)

By Darryl D. Holm

Imperial College Press. Paperback. Book Condition: new. BRAND NEW, Geometric Mechanics: Pt. I: Dynamics and Symmetry (2nd Revised edition), Darryl D. Holm, This textbook introduces the tools and language of modern geometric mechanics to advanced undergraduates and beginning graduate students in mathematics, physics, and engineering. It treats the dynamics of ray optics, resonant oscillators and the elastic spherical pendulum from a unified geometric viewpoint, by formulating their solutions using reduction by Lie-group symmetries. The only prerequisites are linear algebra, calculus and some familiarity with Euler-Lagrange variational principles and canonical Poisson brackets in classical mechanics at the beginning undergraduate level. The ideas and concepts of geometric mechanics are explained in the context of explicit examples. Through these examples, the student develops skills in performing computational manipulations, starting from Fermat's principle, working through the theory of differential forms on manifolds and transferring these ideas to the applications of reduction by symmetry to reveal Lie-Poisson Hamiltonian formulations and momentum maps in physical applications. The many Exercises and Worked Answers aid the student to grasp the essential aspects of the subject. In addition, the modern language and application of differential forms is explained in the context of geometric mechanics, so that the importance of...

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