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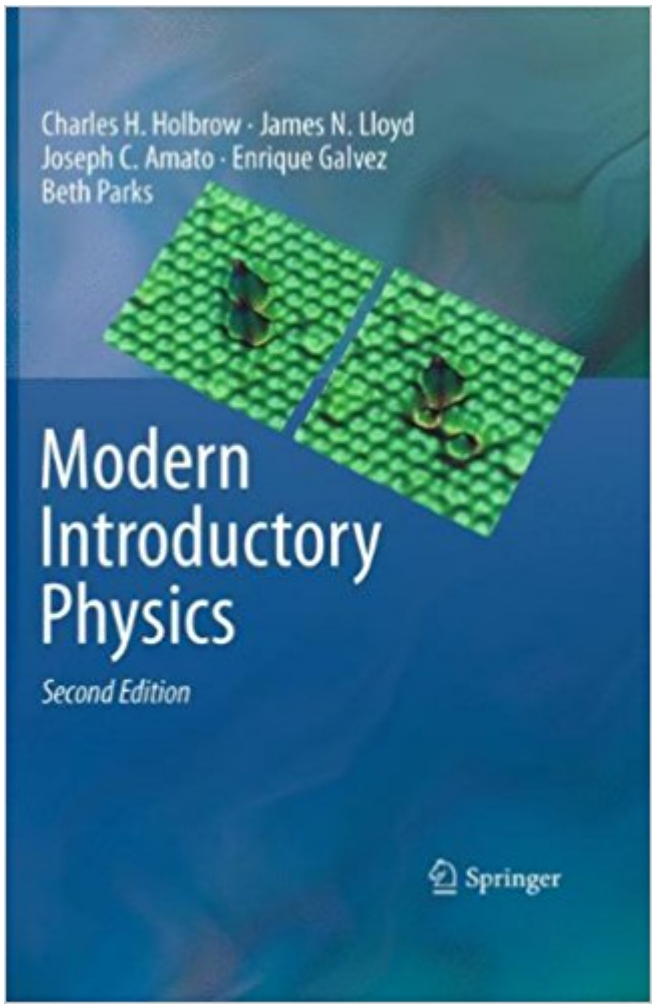
Modern Introductory Physics



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Synopsis

Thisbookgrewoutof anongoing e?orttomodernizeColgate UniversityÃ¢â ¬â„¢s three-term,introductory,calculus-level physicscourse. Thebookisforthe ?rst term of this course and is intended to help ?rst-year college students make a good transition from high-school physics to university physics. Thebookconcentrates onthephysicsthatexplainswhywebelievethat atoms exist and have the properties we ascribe to them. This story line, which motivates much of our professional research, has helped us limit the material presented to a more humane and more realistic amount than is presented in many beginning university physics courses. The theme of atoms also supports the presentation of more non-Newtonian topics and ideas than is customary in the ?rst term of calculus-level physics. We think it is important and desirable to introduce students sooner than usual to some of the major ideas that shape contemporary physicistsÃ¢â ¬â„¢ views of the nature and behavior of matter. Here in the second decade of the twenty-?rst century such a goal seems particularly appropriate. The quantum nature of atoms and light and the mysteries associated with quantum behavior clearly interest our students. By adding and - phasizing more modern content, we seek not only to present some of the physics that engages contemporary physicists but also to attract students to take more physics. Only a few of our beginning physics students come to us sharply focused on physics or astronomy. Nearly all of them, h- ever, have taken physics in high school and found it interesting.

Book Information

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Customer Reviews

From the reviews of the second edition:Ã¢â ¬Å“Strength of this bookÃ¢â ¬â„¢s treatment is that

atoms are used to link Ã¢â ¬Â¦ branches of physics, enabling undergraduates to develop a more coherent understanding of the field. Ã¢â ¬Â¦ a helpful summary of the material covered, longer problems are given at the end of each chapter. Ã¢â ¬Â¦ The layout is clear and contains many illustrative figures. Ã¢â ¬Â¦ I recommended this book as a brave attempt to inject modern physics into the very start of undergraduate life. Ã¢â ¬Â¦ First-year undergraduates or advanced A-level students seeking extra material.Ã¢â ¬Â• (Times Higher Education, May, 2011)Ã¢â ¬Å“Holbrow and colleagues (all, Colgate Univ.) designed this book Ã¢â ¬Â¦ for the first course of an innovative three-semester introductory physics sequence at Colgate. Ã¢â ¬Â¦ serves to introduce students to contemporary physics quickly. Ã¢â ¬Â¦ Even experienced faculty will gain valuable classroom insight from the presentation Ã¢â ¬Â¦ . a physics textbook for majors, many general readers with a high school background in math and physics would find it an accessible introduction to these topics. Summing Up: Recommended. Lower-division undergraduates, advanced high school students, and general readers.Ã¢â ¬Â• (J. R. Burciaga, Choice, Vol. 48 (9), May, 2011)

Modern Introductory Physics, 2nd Edition, by Charles H. Holbrow, James N. Lloyd, Joseph C. Amato, Enrique Galvez, and Beth Parks, is a successful innovative text for teaching introductory college and university physics. It is thematically organized to emphasize the physics that answers the fundamental question: Why do we believe in atoms and their properties?Ã Â Ã Â The book provides a sound introduction to basic physical concepts with particular attention to the nineteenth- and twentieth-century physics underlying our modern ideas of atoms and their structure.Ã Â After a review of basic Newtonian mechanics, the book discusses early physical evidence that matter is made of atoms.Ã Â With a simple model of the atom Newtonian mechanics can explain the ideal gas laws, temperature, and viscosity.Ã Â Basic concepts of electricity and magnetism are introduced along with a more complicated model of the atom to account for the observed electrical properties of atoms. The physics of waves---particularly light and x-rays---and basic features of relativity are explored and used to reveal further details of atomic structure.Ã Â Following the discovery of radioactivity, transmutation, and the atomic nucleus, BohrÃ¢â ¬â„¢s model of the hydrogen atom sets the stage for a view of the atom that becomes fully modern with the introduction of the ideas of quantum mechanics.Ã Â This book presents these ideas in terms of the Heisenberg uncertainty principle and FeynmanÃ¢â ¬â„¢s rules of quantum mechanics and also discusses the intriguing topics of entanglement, non-locality, and BellÃ¢â ¬â„¢s inequalities.Ã Â Here, as everywhere in this book, there is strong emphasis on experiments and observable phenomena that have shaped and confirmed the concepts of physics.To help students make a good transition from

high-school physics to university physics, this book fosters quantitative skills: There is much use of order-of-magnitude calculations, scaling arguments, proportionalities, approximations, and other basic tools of quantitative reasoning, progressing from simple and direct applications in the early parts of the book to more elaborate ones later.Ã Â Ã Â Ã Â The book shows how new physics and new ideas are inferred from experimental data and quantitative reasoning.Ã Â Ã Â A large number of exercises and problems help students clarify their understanding. Modern Introductory Physics, 2nd Edition, is an extensive revision of the original influential and innovative introductory text. Ã Â This new edition includes:- improved exposition of some difficult topics- two new chapters that explore important and intriguing ideas of quantum mechanics in the context of real experiments- many updated problems for students- new questions added to many chapters

I bought this for self-review, the only reason I do not give it 5 stars is due to the fact it is a "general physics" book, without calculus, as I wanted a modern physics review. However it is excellently written, and has very clear explanations of processes from Newtonian to optics to atomic physics.

I used this text for self study. It is an excellent overview of modern physics & appears to be intended for a liberal arts major. I used it as a review. It takes a historical approach & goes through the experimental data establishing modern physics. There is no calculus but it will give you a good understanding of the basics of modern physics. I finally understand Bell’s inequalities! I am now reading Feynman’s Lectures as a follow-up & at least volume #1 is a bit too easy.

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