Cengage Technology Editions are being launched to support educators and learners in making a smooth transition from print to digital learning and instruction.

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- **engaged students, improved learning experiences and better outcomes**
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Information contained in this catalog is correct at the time of printing.

Prices are subject to change without prior notice.
ASTRONOMY

INTRODUCTORY ASTRONOMY

ASTRO \( (\text{WITH CENGAGENOW PRINTED ACCESS CARD}), 2E \)

Michael A. Seeds, Franklin and Marshall College; Dana Backman

Created through a “student-tested, faculty-approved” review process, ASTRO 2e is an engaging and accessible solution to accommodate the diverse lifestyles of today’s learners at a value-based price. ASTRO 2e employs the same engaging writing style that has become a hallmark of Mike Seeds and Dana Backman’s introductory astronomy texts. Updated to reflect current discoveries and research, ASTRO 2e combines the unique 4LTR design and pricing with a traditional table of contents, substantial end-of-chapter assessment, and a robust online homework system, CengageNOW.

NEW TO THIS EDITION

• Content updates by the authors, based on new scientific discovery and research, keep the text current and accurate.
• End-of-chapter material has been added to enable high-quality student assessment.
• Traditional chapter organization to better accommodate most curricula.
• Tear-out Math Review cards provide a handy, portable study tool for students.
• A robust integrated CengageNOW technology package gives students 24/7 access to study tools and assignments so they can work at their own pace or within a schedule set up by the instructor.

FEATURES

• Every 4LTR Press solution comes complete with an engaging print textbook, tear-out review cards, and an eBook—all of which were directly influenced by student focus groups, surveys, and interviews with faculty and students.
• Shorter, comprehensive chapters in a modern design present content in a more engaging and accessible format without minimizing coverage for your course. ASTRO 2e chapters are reorganized according to the traditional solar-system first approach.
• Tear-Out Review Cards (and Tear-Out Math Review cards) at the back of the Student Edition provide students a portable study tool containing all of the pertinent information for class preparation.
• Instructor Prep Cards at the back of the Instructor’s Edition make preparation simple. Detachable cards for each chapter offer a quick map of chapter content, a list of corresponding PowerPoint and video resources, additional examples, and suggested assignments and discussion questions to help you organize chapter content efficiently.
• ASTRO 2e comes with CNOW, a robust integrated technology solution, which will include the qualitative multiple-choice end-of-chapter problems and algorithmic quantitative problems.

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© 2014, 384pp, Paperback, 9781133950134
Fascinating, engaging, and extremely visual, FOUNDATIONS OF ASTRONOMY, 12E, International Edition emphasizes the scientific method throughout as it guides students to answer two fundamental questions: What are we? And how do we know? Updated with the newest developments and latest discoveries in the exciting study of astronomy, authors Michael Seeds and Dana Backman discuss the interplay between evidence and hypothesis, while providing not only fact but also a conceptual framework for understanding the logic of science.

NEW TO THIS EDITION

• Completely updated to reflect the newest developments from the field and thoroughly revised for better student comprehension.
• The latest updates on Earth-based giant telescopes and giant radio telescopes.
• NEW information emphasizing observations over the entire electromagnetic spectrum.
• Reordered subsections on star formation that place structure first and energy generation last.
• Clarified discussions of white dwarfs and supernovae, Revised coverage of neutron stars.
• NEW insight on global warming and ozone depletion, NEW section on extremophiles.
• Additionally, new “How Do We Know” text boxes were added with significant text updates based on external technical review. These boxes highlight great moments in science from various disciplines to illustrate the logical processes scientists use to learn about nature. At least one review question per chapter refers to each “How Do We Know?” discussion which provides students with a review and suggests ways in which instructors could test this material.

• While all chapters have been updated to clarify language to better reflect professional usage and reorganized for better clarity, Chapters 4, 6, 8, 10, 11, 14, 15, 16, 17, 23, 24, and 25 have all undergone a major rewrite and reorganization.
• Key terms no longer appear as a list in the Summary, but are incorporated in bold faced terms (with page numbers) in the chapter summary. This puts them in context and will help students relate the terms to the discussion.
• Can now bundle with Virtual Astronomy Labs 2.0, an online, interactive way for students to explore astronomy and allow them to have a hands-on lab experience from their computers. Enhance students’ understanding of the scientific method with the Virtual Astronomy Labs 2.0. Focusing on 20 of the most important concepts in astronomy, the labs offer students hands-on exercises that complement text topics. Instructors can set up classes online and view student results. Exercise and quiz results are tracked automatically in the gradebook. Version 2.0 has been completely revised. The labs now include more animations, photos, and illustrations. Exercise and quizzes provide score information and feedback upon submission. Labs are correlated to learning objectives and “The Big Ideas.”

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HORIZONS, 13E
Exploring the Universe, Hybrid (with CengageNow Printed Access Card)

Michael A. Seeds, Franklin and Marshall College; Dana Backman; Michele Montgomery, University of Central Florida (UCF)

Mike Seeds’, Dana Backman’s, and Michele Montgomery’s best-selling HORIZONS HYBRID: EXPLORING THE UNIVERSE, Thirteenth Edition, engages students by focusing on two central questions: “How Do We Know?” which emphasizes the role of evidence in the scientific process, providing insights into how science works; and “What Are We?” which highlights our place as planet dwellers in an evolving universe, guiding students to ask questions about where we came from and how we formed a perspective that the study of astronomy is uniquely positioned to emphasize. This new Hybrid edition includes new end-of-chapter material available in our CNOW online homework system. And because every course is as unique as its instructor--and its students--HORIZONS HYBRID: EXPLORING THE UNIVERSE, Thirteenth Edition, is supported by a range of teaching and learning solutions that allow you to craft the best course for your approach and course needs. Our innovative instructor resources include CNOW online homework management, new PowerPoint lectures, new test items, and a MindTap Reader. Students can select from several eBook options, a student MindTap Reader, student tutorial systems, or virtual astronomy labs. HORIZONS HYBRID 13e provides the ideal foundation--our powerful technology tools are the building blocks that help you customize your course to fit your and your students’ needs.

NEW TO THIS EDITION

• New end-of-chapter material written specially for the CNOW homework system to enhance the
online experience. All content is written by Michele Montgomery (UCF) to focus student attention on the textbook and limit the usefulness of Internet searches for all homework answers. Specific content encouraging Internet use is designed to teach students how to identify and use legitimate and evidence-based sources when they are on the Web. Montgomery has also revised and rewritten the exam material and the PowerPoint lectures to better showcase the content available in the textbook. “Large Class Size” exercises are available in every chapter. There is a guide provided to instructors for how to quickly grade homework that is submitted in an essay or short-answer format.

FEATURES

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CONTENTS


© 2015, 528pp, Paperback, 9781133365235
Lucky number 13 for HORIZONS: EXPLORING THE UNIVERSE, International Edition means the proven Seeds/Backman approach and trusted content, fully updated with the latest discoveries and online resources to meet the needs of today’s diverse learners. Going beyond a simple refresh of the printed text format, Cengage Learning has invested in our bestselling astronomy title to offer a range of digital solutions, including Enhanced WebAssign, text specific online tutorials, Virtual Astronomy Labs 2.0, and more. Whether you need a robust online learning system or a turn-key solution to engage students outside the classroom, HORIZONS: EXPLORING THE UNIVERSE, 13E, International Edition delivers!

NEW TO THIS EDITION

• NEW – Text specific “Socratic” tutorials authored by Seeds and Backman, consistent with their unique pedagogy and overall approach.
• NEW – End-of-chapter “Study and Review” sections. These are gatefold inserts in each chapter that include introductory material to online tutorials, new “Great Debate” problems, as well as Virtual Astronomy Lab content.
• Content has been updated to include new findings and edited for clarity.

FEATURES

• Mike Seeds’ and Dana Backman’s conversational and student-friendly writing style, with an emphasis on helping students acquire an understanding of the universe over rote memorization of basic facts.
• Chapter opener “Guideposts” connect previous and future chapters to the material the students are about to read, highlighting “important questions” within that chapter to help motivate students to read.
• “Concept figures” marry art and text to encourage students to synthesize information into one unified concept.
• “Guided Discovery Figures” lead students through several frames of art to demonstrate processes that occur over time, providing brief guiding comments as though the authors were explaining each frame to the student themselves.
• “Concept art portfolios” combine several ideas over two pages, providing an opportunity for students to process information visually and synthesize individual understanding.

Introductions to the Concept Art spreads alert students that there are a certain number of points to look for and a certain number of new terms identified in the introduction in italics and in the art spreads in bold.

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© 2014, 488pp, Paperback, 9781133954170

STARS AND GALAXIES, 8E
Michael A. Seeds, Franklin and Marshall College; Dana Backman

Fascinating, engaging, and extremely visual, Stars and Galaxies Eighth Edition emphasizes the scientific method throughout as it guides students to answer two fundamental questions: What are we? And how do we know? Updated with the newest developments and latest discoveries in the exciting study of astronomy, authors Michael Seeds and Dana Backman discuss the interplay between evidence and hypothesis, while providing not only fact but also a conceptual framework for understanding the logic of science.

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- All chapters have been updated to clarify language to better reflect professional usage and reorganized for better clarity.
- Key terms no longer appear as a list in the Summary, but are incorporated in bold faced terms (with page numbers) in the chapter summary. This puts them in context and will help students relate the terms to the discussion.
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TELE COURSE STUDY GUIDE FOR SEEDS/BACKMAN'S HORIZONS: EXPLORING THE UNIVERSE, 13E
Michael A. Seeds, Franklin and Marshall College; Dana Backman

© 2014, 352pp, Paperback, 9781285087160

THE SOLAR SYSTEM, INTERNATIONAL EDITION, 8E
Michael A. Seeds, Franklin and Marshall College; Dana Backman

Fascinating, engaging, and extremely visual, THE SOLAR SYSTEM, 8E, International Edition emphasizes the scientific method throughout as it guides students to answer two fundamental questions: What are we? And how do we know? Updated with the newest developments and latest discoveries in the exciting study of astronomy, authors Michael Seeds and Dana Backman discuss the interplay between evidence and
hypothesis, while providing not only fact but also a conceptual framework for understanding the logic of science.

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www.cengageasia.com
Whether you need a robust online learning system or a turn-key solution to engage students outside the classroom, UNIVERSE: SOLAR SYSTEMS, STARS, AND GALAXIES, 8E, International Edition delivers!

NEW TO THIS EDITION

• NEW – Text specific “Socratic” tutorials authored by Seeds and Backman, consistent with their unique pedagogy and overall approach.
• NEW – End-of-chapter “Study and Review” sections. These are gatefold inserts in each chapter that include introductory material to online tutorials, new “Great Debate” problems, as well as Virtual Astronomy Lab content.
• Content has been updated to include new findings and edited for clarity.

FEATURES

• Features Mike Seeds’ and Dana Backman’s conversational and student-friendly writing style, with an emphasis on helping students acquire an understanding of the universe over rote memorization of basic facts.
• Chapter opener “Guideposts” connect previous and future chapters to the material the students are about to read, highlighting “important questions” within that chapter to help motivate students to read.
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UNIVERSE, HYBRID (WITH CENGAGENOW PRINTED ACCESS CARD), 8E

Michael A. Seeds, Franklin and Marshall College; Dana Backman; Michele Montgomery, University of Central Florida (UCF)

Reflecting Cengage Learning’s commitment to offering flexible teaching solutions and value for students and instructors, this new hybrid version features the instructional presentation found in the printed text while delivering all the end-of-section and end-of-chapter exercises online in CNOW, the leading online learning system for Astronomy. The result--a briefer printed text that engages students online! Help your students improve their grades and understanding of concepts with this value-packed Hybrid Edition of Michael Seeds' UNIVERSE, 8th edition. An access code to CNOW is included with the text, providing students with powerful online resources that engage students and help them retain what they are learning. The new edition of UNIVERSE means the same proven Seeds/Backman approach and trusted content, fully updated with the latest discoveries and online resources to meet the needs of today’s diverse learners.

NEW TO THIS EDITION

• Text specific “Socratic” tutorials authored by Seeds and Backman, consistent with their unique pedagogy and overall approach.

• Content has been updated to include new findings and edited for clarity.

• Students are directed to CNOW to complete end of chapter activities.

FEATURES

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refers to each “How Do We Know?” discussion which provides students with a review and suggests ways in which instructors could test this material.

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PART I: EXPLORING THE SKY
PART II: THE STARS
PART III: THE UNIVERSE
PART IV: LIFE

© 2013, 496pp, Paperback, 9781111990664
Written with a visual appeal and engaging approach, AEROSPACE ENGINEERING, International Edition provides an overview of the broad range of science, technology, engineering and mathematics (STEM) applications in aerospace engineering. An extensive overview of the history of aviation and technological innovations aid students in seeing the progression of aerospace technology. The use of case studies and real world examples further supports students' understanding and application of STEM to aerospace engineering. Real world connections combined with narratives make the technical material easier to comprehend. The book includes a complete glossary of all related aerospace terminology as well as firsthand accounts of aerospace professionals in their chosen career along with career opportunities.

FEATURES

- A comprehensive introduction to the science, technology, engineering and mathematics of aerospace engineering.
- Strong pedagogy with an engaging approach to connect STEM topics with Aerospace Engineering topics enriched with narratives covering real-world connections and career opportunities
- Visually appealing presentation illustrating past, present, and future developments in aerospace technology.
- Appropriate for any introductory aerospace course.
- Clearly delineates the connections between science, technology, engineering, and mathematics and the value of gaining competence in all of these subjects.
- Presents career opportunities in aerospace engineering and the career experiences of young aerospace professionals.

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AVIATION SAFETY, INTERNATIONAL EDITION

Michael Ferguson; Sean Nelson

AVIATION SAFETY: A BALANCED INDUSTRY APPROACH, International Edition provides an innovative approach to the presentation of contemporary aviation safety detailing a number of pertinent subject matter areas. This book is designed to enhance the pedagogy of aviation safety by presenting topics and information that are derived from and directly applicable to various aspects of the aviation industry. It features issues on contemporary aviation safety, flight safety programs, regulatory organizations, ground operations safety, gap analysis, ethics, and safety management systems. The book provides a theoretical background to safety issues, while making a significant connection to how the information can be directly applied to the aviation industry.
FEATURES
• Authored by experienced aviation safety and educational personnel with years of experience in safety and aviation industry operations.
• Select chapters feature an “In-Focus” section containing excerpts from interviews with actual members of the aviation industry.
• Provides a balanced approach to aviation safety information, covering ground operations safety, gap analysis, the ethics of safety, accident/incident prevention, standard flight-related issues and regulations, and human factors directly related to aviation safety.
• Case studies highlighting safety and human factor-related experiences in the aviation industry appear throughout the text.
• Features unique chapter topics on ethics of safety and occupational wellness.

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© 2014, 432pp, Paperback, 9781133284321

FUNDAMENTALS OF AIR TRAFFIC CONTROL, INTERNATIONAL EDITION, 5E
Michael S. Nolan, Aviation Technology Department, Purdue University

FUNDAMENTALS OF AIR TRAFFIC CONTROL International Edition is an authoritative book that provides readers with a good working knowledge of how and why the air traffic control system works. This book is appropriate for future air traffic controllers, as well as for pilots who need a better understanding of the air traffic control system. FUNDAMENTALS OF AIR TRAFFIC CONTROL, International Edition discusses the history of air traffic control, emphasizing the logic that has guided its development. It also provides current, in-depth information on navigational systems, the air traffic control system structure, control tower procedures, radar separation, national airspace system operation and the FAA's restructured hiring procedures. This is the only college level book that gives readers a genuine understanding of the air traffic control system and does not simply require them to memorize lists of rules and regulations.

NEW TO THIS EDITION
• New required performance based operation standards including navigation, communications, and surveillance.
• Examples of Required Navigation Performance in both the enroute and terminal environment.
• Information on Lateral Navigation and Vertical Navigation. This is the newest procedure for pilots and controllers to follow.
• Updated Atlantic, Pacific and Arctic navigation procedures.
• 9/11 history and required security changes to air traffic control.
• Updated flight examples including the use of traffic flow management.
• New ATC systems including Airport surveillance Radar-11, Standard Terminal Automation Replacement System and En Route Automation Modernization.
• NextGen operations and timeline.

FEATURES
• Describes Common Automated Radar Terminal system, Display system replacement, Standard Terminal Automation Replacement Systems, and Controller-Pilot datalink systems.
• References to new equipment, such as the ARSR-4 and ASR-11 digital radar systems.

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NEW TO THIS EDITION

- NEW CourseMate study and practice materials! Cengage Learning’s online platform is the simplest way to bring course concepts to life with interactive learning, study, and exam preparation tools that support the new edition of Shipman. CourseMate includes an eBook along with animations and videos developed specifically for chemistry, physics, astronomy, and geology topics, flashcards, concept and math review quizzing, and more.
- NEW Hybrid version now available! Featuring the same content and coverage as the full text along with our integrated digital homework solution, Enhanced WebAssign with the Cengage YouBook, the Hybrid version offers unparalleled value. Now your students can have a more interactive learning experience, with the convenience of a text that is both brief and affordable. Cengage YouBook offers instructors the easiest means to quickly personalize course materials, including embedding videos, original material, and section level customization.
- NEW Conceptual Questions and Answers allow students to quiz themselves on concepts as they read the text. This feature is often followed by additional questions that students can explore for further study.
- NEW Preview Questions and Did You Learn? Sections! Each chapter section begins with two Preview Questions that ask about principles and concepts that should be learned in studying the section. Each section ends with two Did You Learn? statements which answer the associated Preview Questions. These questions act as a final reminder to the student of important points of the section.

FEATURES

- Facts – Each chapter begins with a list of Facts – a brief description of pertinent, interesting, and user-friendly items regarding concepts and topics to be covered in the chapter.
- Highlights – These are in-depth discussions of pertinent chapter topics that help expand student knowledge; e.g. United States and Europe: Different Voltages, which explains why different voltages are used and some of the ramifications. Also it is noted that different electrical plugs are used in different parts of the world and a photo of plugs is shown.
- Applying Your Knowledge – These questions involve conceptual and practical applications of material covered in the chapter and everyday topics relevant to the subject matter and challenge the student to apply the concepts learned.
- Visual Connections – Recognizing that many students are visual learners we have increased the visual appeal and accessibility of this edition with new and more color photos and an updated art program.
- End-of-the-Chapter Material – For homework assignments or review, end-of-chapter material contains a variety of choices, including: Key Terms with associated Matching Questions, designed to test students’ ability to match an appropriate statement with each alphabetically labeled key term, thus insuring a proper review of key concepts. For immediate feedback, answers are provided at the back of the book. On-the-Web sections are integrated with CourseMate, presenting topics and questions for further study with links to various websites and resources for reference. Students can print or email their responses to a professor within the browser.
- Additional review sections include: Multiple Choice Questions, Fill-in-the-Blank Questions, Short Answer Questions, and Exercises.

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AN INTRODUCTION TO PHYSICAL SCIENCE, INTERNATIONAL EDITION, 13E

James T. Shipman, Ohio University; Jerry D. Wilson, Lander College; Charles A. Higgins, Jr., Middle Tennessee State University

The goal of INTRODUCTION TO PHYSICAL SCIENCE, 13E, International Edition is to stimulate students’ interest in and gain knowledge of the physical sciences. Presenting content in such a way that students develop the critical reasoning and problem-solving skills that are needed in an ever-changing technological world, the authors emphasize fundamental concepts as they progress through the five divisions of physical sciences: physics, chemistry, astronomy, meteorology, and geology. Ideal for a non-science majors course, topics are treated both descriptively and quantitatively, providing instructors the flexibility to emphasize an approach that works best for their students.

NEW TO THIS EDITION

- NEW CourseMate study and practice materials! Cengage Learning’s online platform is the simplest way to bring course concepts to life with interactive learning, study, and exam preparation tools that support the new edition of Shipman. CourseMate includes an eBook along with animations and videos developed specifically for chemistry, physics, astronomy, and geology topics, flashcards, concept and math review quizzing, and more.
- NEW Conceptual Questions and Answers allow students to quiz themselves on concepts as they read the text. This feature is often followed by additional questions that students can explore for further study.
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LAB GUIDE FOR SHIPMAN/WILSON/HIGGINS’ AN INTRODUCTION TO PHYSICAL SCIENCE, 13E
James T. Shipman, Ohio University; Jerry D. Wilson, Lander College; Charles A. Higgins, Jr., Middle Tennessee State University

This Laboratory Guide contains 55 experiments in the five major divisions of physical science: physics, chemistry, astronomy, geology, and meteorology. Each experiment includes an introduction, learning objectives, a list of apparatus, procedures for taking data, and questions. In addition, many experiments call for calculations and the plotting of graphs, and this guide provides space and graph paper for those purposes.

© 2013, 400pp, Paperback, 9781133109259

INTRODUCTORY PHYSICS

COLLEGE PHYSICS, 2E
Nicholas Giordano, Purdue University

COLLEGE PHYSICS: REASONING AND RELATIONSHIPS, 2E, International Edition motivates student understanding by emphasizing the relationship between major physics principles, and how to apply the reasoning of physics to real-world examples. Such examples come naturally from the life sciences, and this text ensures that students develop a strong understanding of how the concepts relate to each other and to the real world. COLLEGE PHYSICS: REASONING AND RELATIONSHIPS, 2E, International Edition motivates student learning with its use of these original applications drawn from the life sciences and familiar everyday scenarios, and prepares students for the rigors of the course with a consistent five-step problem-solving approach. Available with this Second Edition, the new Enhanced WebAssign program features ALL the quantitative end-of-chapter problems and a rich collection of Reasoning and Relationships tutorials, personally adapted for WebAssign by Nick Giordano. This provides exceptional continuity for your students whether they choose to study with the printed text or by completing online homework.

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• NEW Enhanced WebAssign Reasoning and Relationships tutorials, adapted for WebAssign by Nick Giordano, coach students through the process of making reasonable estimates of key parameters when exact information is not supplied—and include feedback specific to students’ common misconceptions. Such creative problem solving is a valuable skill for students in all endeavors.

• NEW worked examples and new Concept Checks added to nearly every chapter give students additional problem-solving examples. All end-of-chapter questions and problems were systematically reviewed and edited for clarity, and new Reasoning and Relationships problems (typically three per chapter) were added.

FEATURES

• Addresses Student Misconceptions – Chapter 2 offers a qualitative and conceptual discussion of Newton’s laws of motion and what they tell us about the relationship between forces and motion. The goal is to arm students with an understanding of this relationship to address many of their pre-Newtonian misconceptions and prepare for the discussion of the application of those laws in Chapter 3 and beyond. Armed with an understanding of the proper relationship between kinematics and forces, students can then reason about a variety of problems
in mechanics. This approach also provides instructors with the flexibility to introduce a wider variety of problems much sooner in the course, and models for students the process of successful study in physics.

- Emphasis on Developing Strong Problem Solving Skills—A consistent five-step approach to problem solving is featured in every example, helping students move beyond narrow applications of formulas to recognize the big picture in a given situation. Students are asked to recognize the physical principles involved, draw a sketch of the problem, identify the relationships between known and unknown quantities, solve for the unknown quantity, and ask what the answer means and whether it makes sense.

- Numerous innovative Reasoning and Relationships problems in both the problem sets and in-chapter examples encourage students to use estimations and careful assumptions to gain an intuitive understanding of real-world situations. By applying fundamental principles to solve problems creatively and effectively, students deepen their understanding of physics. Explicit problem-solving strategies are also given for major classes of quantitative problems, such as applying the conservation of mechanical energy.

- Relationships Between Physics and the Life Sciences—A unique range of applications emphasizes the relationships between physics and other areas of science, particularly the life sciences. For example, molecular motors are discussed as an application of work and energy (Chapter 6), and photosynthesis is covered as a thermodynamic process (Chapter 16). Applications such as these are interwoven throughout the text to motivate student understanding.

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- Examples and concepts build on previous knowledge throughout the text, revisiting key ideas and topics to build a stronger understanding of the relationships between various physical principles and how they can be applied to the students’ experience. The theme of amplifying forces, for example, is revisited during later discussions of work and energy and is further applied to discuss the mechanics of the ear.

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COLLEGE PHYSICS, 10E

Raymond A. Serway, James Madison University (Emeritus); Chris Vuille, Embry-Riddle Aeronautical University

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• Modern Artwork. Every piece of artwork in the tenth edition is in a modern style that helps express the physics principles at work in a clearer and more precise fashion. Every piece of art is also drawn to make certain that the physical situations presented corresponded exactly to the text discussion at hand.

• Conceptual Questions. At the end of each chapter, there are approximately a dozen conceptual questions, providing the student with a means of self-testing the concepts presented in the chapter. Some conceptual questions are appropriate for initiating classroom discussions.

• Problems. All questions and problems for this revision were carefully reviewed to improve their variety, interest, and pedagogical value while maintaining their clarity and quality. An extensive set of problems is included at the end of each chapter (in all, almost 2,000 problems are provided in the tenth edition).

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NEW TO THIS EDITION
• Analytics from Enhanced WebAssign Used to Revise Questions and Problems. As part of the revision of the questions and problems sets, the authors utilized extensive user analytics gathered by WebAssign, from both instructors who assigned and students who worked on problems from previous editions of COLLEGE PHYSICS. These analytics helped tremendously, indicating when the phrasing in problems could be clearer, thus providing guidance on how to revise problems so that they were more easily understandable for students and more easily assignable in Enhanced WebAssign. Finally, the analytics were used to ensure that the problems most often assigned by professors were retained for this new edition.
• Thorough Revision of Artwork. Every piece of artwork in the ninth edition was revised in a new and modern style that helps express the physics principles at work in a clearer and more precise fashion. Every piece of art was also revised to make certain that the physical situations presented corresponded exactly to the text discussion at hand.
• Focus Pointers, a new feature for many pieces of art. These either point out important aspects of a figure or guide students through a process illustrated by the artwork or photo. This new art style also helps those students who are visual learners.
• Integration with Enhanced WebAssign. The textbook’s tight integration with Enhanced WebAssign content facilitates an online learning environment that helps students improve their problem-solving skills and gives them a variety of tools to meet their individual learning styles.
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end-of-Example Questions and Exercises. The questions usually require a conceptual response or determination, but they also include estimates requiring knowledge of the relationships between concepts. The answers for the Example Questions can be found at the back of the book.

• Multiple-Choice Questions. These questions serve several purposes: Some require calculations designed to facilitate students' familiarity with the equations, the variables used, the concepts the variables represent, and the relationships between the concepts. The rest are conceptual and are designed to encourage physical thinking.

• Conceptual Questions. At the end of each chapter, there are approximately ten to fifteen conceptual questions. The Applying Physics examples presented in the text serve as models for students when conceptual questions are assigned and show how the concepts can be applied to understanding the physical world. The conceptual questions provide the student with a means of self-testing the concepts presented in the chapter. Some conceptual questions are appropriate for initiating classroom discussions. Answers to odd-numbered conceptual questions are included in the answer section at the end of the book and in the Student Solutions Manual/Study Guide, and answers to all questions are found in the Instructor's Solutions Manual.

• Problem-solving skills and strategies are consistently and carefully presented to help you build this critical skill. The text presents a general problem-solving methodology and reinforces this methodology throughout the text. This feature helps you identify and master the essential steps in solving problems and increases your skills as a problem solver.

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COLLEGE PHYSICS, INTERNATIONAL EDITION
Nicholas Giordano, Purdue University

COLLEGE PHYSICS: REASONING & RELATIONSHIPS, INTERNATIONAL EDITION is an innovative new text that uses the hallmark theme of “reasoning and relationships” to help students master the fundamental concepts of the course. By understanding the reasoning behind problem solving, students learn to recognize the concepts involved, think critically about them, and move beyond merely memorizing facts and equations. By recognizing the relationships between physics and their experiences, students will develop a stronger understanding of how the concepts relate to each other. COLLEGE PHYSICS: REASONING & RELATIONSHIPS, INTERNATIONAL EDITION uses original applications drawn from the life sciences and familiar everyday scenarios to motivate student learning and a consistent problem-solving approach to prepare students for the rigors of the course.

FEATURES

• A unique range of applications emphasizes the relationships between physics and other areas of science, particularly the life sciences. For example, molecular motors are discussed as an application of
work and energy (Chapter 6), and photosynthesis is covered as a thermodynamic process (Chapter 16). Applications such as these are interwoven throughout the text to motivate student understanding.

• A consistent five-step approach to problem solving is featured in every example, helping students move beyond narrow applications of formulas to recognize the big picture in a given situation. Students are asked to recognize the physical principles involved; draw a sketch of the problem; identify the relationships between known and unknown quantities; solve for the unknown quantity; and ask what the answer means and if it makes sense.

• Numerous innovative reasoning and relationship problems in both the problem sets and in-chapter examples encourage students to use estimations and careful assumptions to gain an intuitive understanding of real-world situations. By applying fundamental principles to solve problems creatively and effectively, students deepen their understanding of physics.

• Examples and concepts build on previous knowledge throughout the text, revisiting key ideas and topics to build a stronger understanding of the relationships between various physical principles and how they can be applied to the students’ experience. The theme of amplifying forces, for example, is revisited during later discussions of work and energy and is further applied to discuss the mechanics of the ear.

• The text is fully supported by Enhanced WebAssign®, the market-leading online homework system developed by physicists for physicists. This enhanced version includes all end-of-chapter problems, Reasoning and Relationship problems, Concept Checks, animations and simulations, and most worked examples. All questions provide answer-specific feedback, and many provide guided hints to drive students to content mastery.

• The relationship between forces and motion, the central thread of mechanics, is clearly established in Chapter 2, helping to dispel common misconceptions and allowing for the introduction of more interesting and relevant applications earlier in the course. This approach is revisited in the chapters on rotational motion.

• Concept Checks occur throughout each chapter as a tool to aid student reflection on key principles and fundamental issues. Many Concept Checks have been cast in an objective format to facilitate use with audience response system technology.

• Marginal Insights draw attention to specific key ideas in the text, adding greater depth to a topic or reinforcing key important messages.

• A selection of end-of-chapter Questions measure student understanding of key concepts. End-of-chapter Problems have been prepared to provide students with the ability to practice their skills with straightforward, intermediate, and challenging problems. Additional Problems synthesize ideas across sections and chapters.

• Summaries at the end of each chapter have been designed to replicate a “study card” format to organize information and facilitate student study. Concepts have been classified as “Key Concepts and Principles” or “Applications,” many including explanatory diagrams.

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Raymond A. Serway, James Madison University (Emeritus); Chris Vuille, Embry-Riddle Aeronautical University

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8. Rotational Equilibrium and Rotational Dynamics.

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COLLEGE PHYSICS, VOLUME 2, 10E
Raymond A. Serway, James Madison University (Emeritus); Chris Vuille, Embry-Riddle Aeronautical University

While physics can seem challenging, its true quality is the sheer simplicity of fundamental physical theories-theories and concepts that can enrich your view of the world around you. COLLEGE PHYSICS, Tenth Edition, provides a clear strategy for connecting those theories to a consistent problem-solving approach, carefully reinforcing this methodology throughout the text and connecting it to real-world examples. COLLEGE PHYSICS, Tenth Edition, combines a logical presentation of the physical concepts with a
consistent problem-solving strategy that results in true understanding for the student. The new edition features learning objectives for every section of the text, new Warm-Up Exercises to review mathematical and physical concepts that are prerequisites for a given chapter's problems set, and a general preview of the new physics concepts covered, as well as new online tutorials to assist students in understanding how to apply certain key concepts presented in a given chapter. For students planning to take the MCAT exam, the text's exclusive test prep and review tools help them prepare. The new edition is also supported by innovative technologies to enhance your teaching experience and your students' learning.

**NEW TO THIS EDITION**

- **New Learning Objectives Added for Every Section.** In response to the growing trend across the discipline (and the request of many users), learning objectives were added for every section of this edition. These identify the major concepts in a section and also identify the specific skills/outcomes students should be able to demonstrate if they have a solid understanding of those concepts.

- **New Warm-Up Exercises in Every Chapter.** Warm-up exercises appear at the beginning of each chapter's problems set, and were inspired by Chris Vuille's classroom experiences. The warm-up exercises review mathematical and physical concepts that are prerequisites for a given chapter's problems set, and also provide students with a general preview of the new physics concepts covered in a given chapter. By doing the warm-up exercises first, students will have an easier time getting comfortable with the new concepts of a chapter before tackling harder problems.

- **New Online Tutorials.** These new online tutorials offer students another training tool to assist them in understanding how to apply certain key concepts presented in a given chapter. The tutorials first present a brief review of the necessary concepts from the text, together with advice on how to solve problems involving them. The student can then attempt to solve one such problem, guided by questions presented in the tutorial. The tutorial automatically scores student responses and presents correct solutions together with discussion. Students can then practice on several additional problems of a similar level, and in some cases go to higher level or related problems, depending on the concepts covered in the tutorial.

**FEATURES**

- **Worked Examples.** For this tenth edition, all the worked examples were reviewed and many improvements were made. The questions usually require a conceptual response or determination, but they also include estimates requiring knowledge of the relationships between concepts. The answers for the Example Questions can be found at the back of the book.

- **Modern Artwork.** Every piece of artwork in the tenth edition is in a modern style that helps express the physics principles at work in a clearer and more precise fashion. Every piece of art is also drawn to make certain that the physical situations presented corresponded exactly to the text discussion at hand.

- **Conceptual Questions.** At the end of each chapter, there are approximately a dozen conceptual questions, providing the student with a means of self-testing the concepts presented in the chapter. Some conceptual questions are appropriate for initiating classroom discussions.

- **Problems.** All questions and problems for this revision were carefully reviewed to improve their variety, interest, and pedagogical value while maintaining their clarity and quality. An extensive set of problems is included at the end of each chapter.

- **Problem-Solving Strategies.** A general problem-solving strategy to be followed by the student is outlined at the end of Chapter 1. This feature helps students identify the essential steps in solving problems and increases their skills as problem solvers.

- **COLLEGE PHYSICS, Tenth Edition, is fully supported by Enhanced WebAssign®, the market-leading online homework system developed by physicists for physicists. This enhanced version includes all quantitative end-of-chapter problems, Warm-Up Exercises, Conceptual Questions, Quick Quizzes, and most Worked Examples. All questions provide targeted feedback, and many provide guided hints to drive students to content mastery. The Quick Prep feature allows instructors to assign essential mathematics examples to bring students “up to speed.”**

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Part IV: ELECTRICITY AND MAGNETISM. 15. Electric
COLLEGE PHYSICS, VOLUME 2, INTERNATIONAL EDITION, 9E
Raymond A. Serway, James Madison University (Emeritus); Chris Vuille, Embry-Riddle Aeronautical University

While physics can seem challenging, its true quality is the sheer simplicity of fundamental physical theories—theories and concepts that can enrich your view of the world around you. COLLEGE PHYSICS, Volume 2, 9e, International Edition provides a clear strategy for connecting those theories to a consistent problem-solving approach, carefully reinforcing this methodology throughout the text and connecting it to real-world examples. For students planning to take the MCAT exam, the text includes exclusive test prep and review tools to help you prepare.

NEW TO THIS EDITION

• Analytics from Enhanced WebAssign Used to Revise Questions and Problems. As part of the revision of the questions and problems sets, the authors utilized extensive user analytics gathered by WebAssign, from both instructors who assigned and students who worked on problems from previous editions of COLLEGE PHYSICS. These analytics helped tremendously, indicating when the phrasing in problems could be clearer, thus providing guidance on how to revise problems so that they were more easily understandable for students and more easily assignable in Enhanced WebAssign. Finally, the analytics were used to ensure that the problems most often assigned by professors were retained for this new edition.
• Thorough Revision of Artwork. Every piece of artwork in the ninth edition was revised in a new and modern style that helps express the physics principles at work in a clearer and more precise fashion. Every piece of art was also revised to make certain that the physical situations presented corresponded exactly to the text discussion at hand.
• Focus Pointers, a new feature for many pieces of art. These either point out important aspects of a figure or guide students through a process illustrated by the artwork or photo. This new art style also helps those students who are visual learners.
• Integration with Enhanced WebAssign. The textbook’s tight integration with Enhanced WebAssign content facilitates an online learning environment that helps students improve their problem-solving skills and gives them a variety of tools to meet their individual learning styles.
• Master It tutorials in Enhanced WebAssign help students solve problems by having them work through a stepped-out solution. Problems with Master It tutorials are indicated in each chapter’s problem set with an M icon.

FEATURES

• Worked Examples. For this ninth edition, we have reviewed all the worked examples, made improvements, and added or revised many end-of-Example Questions and Exercises. The questions usually require a conceptual response or determination, but they also include estimates requiring knowledge of the relationships between concepts. The answers for the Example Questions can be found at the back of the book.
• Multiple-Choice Questions. These questions several purposes: Some require calculations designed to facilitate students’ familiarity with the equations, the variables used, the concepts the variables represent, and the relationships between the concepts. The rest are conceptual and are designed to encourage physical thinking.
• Conceptual Questions. At the end of each chapter, there are approximately ten to fifteen conceptual questions. The Applying Physics examples presented in the text serve as models for students when conceptual questions are assigned and show how the concepts can be applied to understanding the physical world. The conceptual questions provide the student with a means of self-testing the concepts presented in the chapter. Some conceptual questions are appropriate for initiating classroom discussions. Answers to odd-numbered conceptual questions are included in the answer section at the end of the
book and in the Student Solutions Manual/Study Guide, and answers to all questions are found in the Instructor’s Solutions Manual.

- Problem-solving skills and strategies are consistently and carefully presented to help you build this critical skill. The text presents a general problem-solving methodology and reinforces this methodology throughout the text. This feature helps you identify and master the essential steps in solving problems and increases your skills as a problem solver.
- There are three types of problems we think instructors and students will find interesting as they use the text:

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**NEW TO THIS EDITION**

- NEW Enhanced WebAssign Reasoning and Relationships tutorials, adapted for WebAssign by Nick Giordano, coach students through the process of making reasonable estimates of key parameters when exact information is not supplied—and include feedback specific to students’ common misconceptions. Such creative problem solving is a valuable skill for students in all endeavors.
- NEW worked examples and new Concept Checks added to nearly every chapter give students additional problem-solving examples. All end-of-chapter questions and problems were systematically reviewed and edited for clarity, and new Reasoning and Relationships problems (typically three per chapter) were added.

**FEATURES**

- Addresses Student Misconceptions – Chapter 2 offers a qualitative and conceptual discussion of Newton’s laws of motion and what they tell us about the relationship between forces and motion. The goal is to arm students with an understanding of this relationship to address many of their pre-Newtonian misconceptions and prepare for the discussion of the application of those laws in Chapter 3 and beyond. Armed with an understanding of the proper relationship between kinematics and forces, students can then reason about a variety of problems in mechanics. This approach also provides instructors with the flexibility to introduce a wider variety of problems much sooner in the course, and models for students the process of successful study in physics.
• Emphasis on Developing Strong Problem Solving Skills—A consistent five-step approach to problem solving is featured in every example, helping students move beyond narrow applications of formulas to recognize the big picture in a given situation. Students are asked to recognize the physical principles involved, draw a sketch of the problem, identify the relationships between known and unknown quantities, solve for the unknown quantity, and ask what the answer means and whether it makes sense.

• Numerous innovative Reasoning and Relationships problems in both the problem sets and in-chapter examples encourage students to use estimations and careful assumptions to gain an intuitive understanding of real-world situations. By applying fundamental principles to solve problems creatively and effectively, students deepen their understanding of physics. Explicit problem-solving strategies are also given for major classes of quantitative problems, such as applying the conservation of mechanical energy.

• Relationships Between Physics and the Life Sciences—A unique range of applications emphasizes the relationships between physics and other areas of science, particularly the life sciences. For example, molecular motors are discussed as an application of work and energy (Chapter 6), and photosynthesis is covered as a thermodynamic process (Chapter 16). Applications such as these are interwoven throughout the text to motivate student understanding.

• Comprehensive Online Learning Resources—The text is fully supported by Enhanced WebAssign®, the market-leading online homework system developed by physicists for physicists. This enhanced version includes all quantitative end-of-chapter problems; Reasoning and Relationships problems; author-written and -coded tutorials; Concept Checks; animations; PHET simulations; and a customizable, interactive eBook. All questions provide answer-specific feedback, and many provide guided hints to drive students to content mastery.

• Examples and concepts build on previous knowledge throughout the text, revisiting key ideas and topics to build a stronger understanding of the relationships between various physical principles and how they can be applied to the students’ experience. The theme of amplifying forces, for example, is revisited during later discussions of work and energy and is further applied to discuss the mechanics of the ear.

• Concept Checks occur throughout each chapter as a tool to aid student reflection on key principles and fundamental issues. Many Concept Checks have been cast in an objective format to facilitate use with audience response system technology.

• Marginal Insights draw attention to specific ideas in the text, adding greater depth to a topic or reinforcing important key messages.

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NEW EDITION!

FAST TRACK TO A 5 FOR SERWAY/ VUILLE’S COLLEGE PHYSICS, 10E

Raymond A. Serway, James Madison University (Emeritus); Chris Vuille, Embry-Riddle Aeronautical University

© 2015, Paperback, 9781285762647
Building upon Serway and Jewett’s solid foundation in the classic text, Physics for Scientists and Engineers, this first Asia-Pacific edition of Physics is a practical and engaging introduction to Physics. Using international and local case studies and worked examples to add to the concise language and high quality artwork, this new regional edition further engages students and highlights the relevance of this discipline to their learning and lives.

NEW TO THIS EDITION

• NEW international and regional CASES to major PARTS of the text to demonstrate current research and application of physics concepts to science and engineering to students in this region
• Easier to carry in NEW TWO smaller volumes for flexibility and manageability
• More ENGINEERING and SCIENTIFIC examples and problems to help students relate physics concepts to a range of other disciplines
• New ‘Try This’ examples demonstrate key concepts with simple experiments that students can do themselves using everyday items
• New Uncertainty icon highlights coverage of uncertainty integrated throughout the text to help students identify and understand this important concept in context

FEATURES

• International and regional case studies throughout the text have been written by practitioners from a wide range of disciplines and cover relevant applications and research in physics, helping students to engage and understand physics
• Pitfall prevention boxes throughout the text give tips to help students avoid common physics mistakes and misconceptions. These address both common student misconceptions and situations in which students often follow unproductive paths
• Each chapter starts with a focus question to motivate students and provide an insight into the material that follows. These focus questions are revisited at the end of the chapter
• Each chapter begins with NEW learning objectives to help students identify what they will be learning and what they will be able to do after reading the chapter
• The worked examples have always been a hallmark of the text. Each worked Example provides conceptual explanations along with the maths for every step. The examples closely follow the authors’ proven General Problem Solving Strategy to reinforce good problem solving habits. About one-third of the worked examples include What If? Extensions, which further reinforce conceptual understanding.

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PHYSICS
Volume 2: Asia-Pacific Edition
Raymond A. Serway, James Madison University (Emeritus); John W. Jewett, California State Polytechnic University, Pomona; Kate Wilson, Australian Defence Force Academy (UNSW); Anna Wilson, University of Canberra, Australian National University

Building upon Serway and Jewett’s solid foundation in the modern classic text, Physics for Scientists and Engineers, this first Asia-Pacific edition of Physics is a practical and engaging introduction to Physics. Using international and local case studies and worked examples to add to the concise language and high quality artwork, this new regional edition further engages students and highlights the relevance of this discipline to their learning and lives.

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NEW EDITION!

PHYSICS FOR SCIENTISTS AND ENGINEERS WITH MODERN PHYSICS, HYBRID (WITH ENHANCED WEBASSIGN HOMEWORK AND EBOOK LOE PRINTED ACCESS CARD FOR MULTI TERM MATH AND SCIENCE), REPRINT, 9E

Raymond A. Serway, James Madison University (Emeritus); John W. Jewett, California State Polytechnic University, Pomona

As a market leader, PHYSICS FOR SCIENTISTS AND ENGINEERS is one of the most powerful brands in the physics market. While preserving concise language, state-of-the-art educational pedagogy, and top-notch worked examples, the Ninth Edition highlights the Analysis Model approach to problem-solving, including brand-new Analysis Model Tutorials, written by text co-author John Jewett, and available in Enhanced WebAssign. The Analysis Model approach lays out a standard set of situations that appear in most physics problems, and serves as a bridge to help students identify the correct fundamental principle—and then the equation—to utilize in solving that problem. As they gain more experience, students lean less on the Analysis Model approach and begin to identify fundamental principles directly, more in the manner the physicist does.

• NEW ANALYSIS MODEL BOXES. To better integrate the Analysis Model approach, Analysis Model boxes, which appear at the end of any section that introduces a new Analysis Model, recap the Analysis Model just introduced and provide examples of the types of problems that students could solve using the model. These boxes function as a “refresher” before students see the Analysis Models in use in the worked examples for a given section.

• EXTENSIVE ANALYSIS MODEL REINFORCEMENT. Worked examples that utilize analysis models (designated by an “AM” icon) thoroughly integrate the Analysis Model approach in their solutions. The Analysis Model approach is further reinforced in end-of-chapter summary under the heading “Analysis Models for Problem Solving” and through the new “Analysis Model Tutorials” based on the selected end-of-chapter problems that appear in Enhanced WebAssign.

• NEW ANALYSIS MODEL TUTORIALS. 160 new tutorials written by text co-author John Jewett (indicated in each chapter’s problem set with an “AMT” icon) strengthen students’ problem-solving skills by guiding them through the steps in the problem-solving process. Important first steps include making predictions and focusing their strategy on physics concepts before they start to solve the problem quantitatively. A critical component of these tutorials is the selection of an appropriate analysis model to describe what is going on in the problem. This step allows students to make the important link between the situation in the problem and the mathematical representation of the situation. Analysis Model tutorials include meaningful feedback at each step to help students practice the problem-solving process and improve their skills. Feedback at the end of the tutorial encourages students to think about how the final answer matches their original predictions.

• ANNOTATED INSTRUCTOR’S EDITION. New for this edition, the Annotated Instructor’s Edition includes
teaching tips and other notes on how best to use the textbook in the classroom. Additionally, the full slate of icons that accompany the various types of problems are included in the questions/problems sets. (The Student Edition will contain only those icons needed by students.)

- **NEW PRE-LECTURE CONTENT IN ENHANCED WEBASSIGN.** Updated simulations offer additional parameters to enhance investigation of a physical phenomenon. Students can make predictions, change the parameters, and then observe the results. Each simulation comes with conceptual and analytical questions which guide students to a deeper understanding and help promote a robust physical intuition.

- **NEW “MASTER ITS” IN ENHANCED WEBASSIGN.** Approximately 50 of the 376 selected problems that appear as “Master Its” in Enhanced WebAssign are new for the Ninth Edition. “Master Its” (indicated in problem sets with an “M” icon) help students work through the problems one step at a time.

**FEATURES**

- **ANALYSIS OF PROBLEMS USAGE DATA FROM WEBASSIGN GUIDED PROBLEMS.** The authors used extensive user data gathered by WebAssign from professors and students to identify problems that contained muddled or unclear phrasing. The data was used to ensure that the problems professors assigned the most were retained for this new edition. In each chapter’s problems set, the top quartile of problems that were assigned in WebAssign are given an icon for easy identification.

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- **PROBLEM SOLVING STRATEGY.** A General Problem Solving Strategy, outlined early in the text, provides a series of steps similar to those taken by professional physicists in solving problems. This problem solving strategy is revisited in each Worked Example, so students approach problems consistently, developing stronger problem-solving skills. The General Problem Solving Strategy is further reinforced by Problem-Solving Strategy boxes that provide additional tips for tackling specific types of problems.

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PHYSICS FOR SCIENTISTS AND ENGINEERS WITH MODERN PHYSICS, INTERNATIONAL EDITION, 9E
Raymond A. Serway, James Madison University (Emeritus); John W. Jewett, California State Polytechnic University, Pomona

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Achieve success in your physics course by making the most of what PHYSICS FOR SCIENTISTS AND ENGINEERS, 8e, International Edition has to offer you. From a host of in-text features to a range of outstanding technology resources, you’ll have everything you need to understand the natural forces and principles of physics. Throughout every chapter, the authors have built in a wide range of examples, exercises, and illustrations that will help you understand the laws of physics AND succeed in your course!

NEW TO THIS EDITION

• Line-by-Line Revision of the Questions and Problems Set. The authors reviewed each Question and Problem line-by-line to improve both readability and assignability. This extensive revision involved editing problems for clarity, editing for length, introducing better problem architecture by breaking up problems into clearly defined parts, as well as revising to make problems clearer to both professors and students.

• Analysis of Problems Usage Data from WebAssign Guided Problems Revision. The authors have utilized extensive user data gathered by WebAssign from both professors and students to identify problems containing muddled or unclear phrasing. The data was used to ensure that the problems professors assigned the most were retained for this new edition. In each chapter’s problems set, the top quartile of problems that were assigned in WebAssign have been given an icon for easy identification.

• WebAssign Tutorials. The text now offers stepped-through solutions to a select number of problems per chapter in Enhanced WebAssign. These problems are indicated in each chapter’s problem set with a “T” icon.

• Revised Questions and Problems Set Organization. For the Eighth Edition the authors have overhauled the organization of the questions and problems sets. The Questions section is now divided into two sections: Objective Questions and Conceptual Questions.

• Objective Questions are multiple-choice, true/false, ranking, or other multiple guess-type questions. Some require calculations designed to facilitate students’ familiarity with the equations, the variables used, the concepts the variables represent, and the relationships between the concepts. Others are more conceptual in nature and are designed to encourage conceptual thinking.

• Conceptual Questions are more traditional short-answer and essay-type questions that require students to think conceptually about a physical situation.

• The Problems set is organized by the sections in each chapter, but within each section the problems now “platform” students to higher-order thinking by presenting all the straightforward (black) problems in the section first, followed by the intermediate (blue) problems. The “Additional Problems” section remains in its usual place, but at the end of each chapter there is a new section “Challenging Problems” that gathers the toughest problems in a given chapter in one place.

• Two new problem types have been introduced for this edition: Quantitative/Conceptual problems contain parts that ask students to think both quantitatively and conceptually. Symbolic problems ask students to solve a problem using only symbolic manipulation. Reviewers asked us specifically to increase the amount of symbolic problems found in the text, as this better reflects the way they want their students to think when solving physics problems.

• Expansion of the Analysis Model Approach. The “Analysis Model” approach has been expanded for the 8th edition to help students to solve problems more like a physicist solves problems.

• Thorough Revision of Artwork. Every piece of artwork in the Eighth Edition was revised in a new and modern style that helps express the physics principles as well as making certain that the physical situations presented corresponded exactly to the textual discussion at hand. “Talking labels” that help walk students through the often complex figures without having to go back-and-forth from the figure legend to the figure itself have also been added.

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Part I: MECHANICS. 1. Physics and Measurement. 2. Motion in One Dimension. 3. Vectors. 4. Motion in Two Dimensions. 5. The Laws of Motion. 6. Circular Motion

© 2010, 1296pp, Paperback, 9781439048467

NEW TO THIS EDITION

• STRONGER INTEGRATION OF THE ANALYSIS MODEL APPROACH TO PROBLEM SOLVING. Because students often find it easier to identify a situation rather than a fundamental principle, this revision highlights the Analysis Model approach which lays out a standard set of situations that appear in most physics problems, and serves as a bridge to help students identify the correct fundamental principle—and then the equation—to utilize in solving that problem. As they gain more experience, students lean less on the Analysis Model approach and begin to identify fundamental principles directly, more in the manner the physicist does.

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“Analysis Model Tutorials” based on the selected end-of-chapter problems that appear in Enhanced WebAssign.

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PHYSICS FOR SCIENTISTS AND ENGINEERS, INTERNATIONAL EDITION, 9E
Raymond A. Serway, James Madison University (Emeritus); John W. Jewett, California State Polytechnic University, Pomona

As a market leader, PHYSICS FOR SCIENTISTS AND ENGINEERS, 9E, International Edition is one of the most powerful brands in the physics market. While preserving concise language, state-of-the-art educational pedagogy, and top-notch worked examples, the Ninth Edition highlights the Analysis Model approach to problem-solving, including brand-new Analysis Model Tutorials, written by text co-author John Jewett, and available in Enhanced WebAssign. The Analysis Model approach lays out a standard set of situations that appear in most physics problems, and serves as a bridge to help students identify the correct fundamental principle and then the equation to utilize in solving that problem. As they gain more experience, students lean less on the Analysis Model approach and begin to identify fundamental principles directly, more in the manner the physicist does.

• NEW ANALYSIS MODEL BOXES. To better integrate the Analysis Model approach, Analysis Model boxes, which appear at the end of any section that introduces a new Analysis Model, recap the Analysis Model just introduced and provide examples of the types of problems that students could solve using the model. These boxes function as a “refresher” before students see the Analysis Models in use in the worked examples for a given section.

• EXTENSIVE ANALYSIS MODEL REINFORCEMENT. Worked examples that utilize analysis models (designated by an “AM” icon) thoroughly integrate the Analysis Model approach in their solutions. The Analysis Model approach is further reinforced in end-of-chapter summary under the heading “Analysis Models for Problem Solving” and through the new “Analysis Model Tutorials” based on the selected end-of-chapter problems that appear in Enhanced WebAssign.

• NEW ANALYSIS MODEL TUTORIALS. 160 new tutorials written by text co-author John Jewett (indicated in each chapter’s problem set with an “AMT” icon) strengthen students’ problem-solving skills by guiding them through the steps in the problem-solving process. Important first steps include making predictions and focusing their strategy on physics concepts before they start to solve the problem quantitatively. A critical component of these tutorials is the selection of an appropriate analysis model to describe what is going on in the problem. This step allows students to make the important link between the situation in the problem and the mathematical representation of the situation. Analysis Model tutorials include meaningful feedback at each step to help students practice the problem-solving process and improve their skills. Feedback at the end of the tutorial encourages students to think about how the final answer matches their original predictions.

• ANNOTATED INSTRUCTOR’S EDITION. New for this edition, the Annotated Instructor’s Edition includes teaching tips and other notes on how best to use the textbook in the classroom. Additionally, the full slate of icons that accompany the various types of problems
are included in the questions/problems sets. (The Student Edition will contain only those icons needed by students.)

NEW PRE-LECTURE CONTENT IN ENHANCED WEBASSIGN. Updated simulations offer additional parameters to enhance investigation of a physical phenomenon. Students can make predictions, change the parameters, and then observe the results. Each simulation comes with conceptual and analytical questions which guide students to a deeper understanding and help promote a robust physical intuition.

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FEATURES

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the equation—to utilize in solving that problem. The unified art program and the carefully thought out problem sets also enhance the thoughtful instruction for which Raymond A. Serway and John W. Jewett, Jr. earned their reputations. PHYSICS FOR SCIENTISTS AND ENGINEERS VOLUME 2, 9E, International Edition continues to be accompanied by Enhanced WebAssign in the most integrated text-technology offering available today.

NEW TO THIS EDITION

• STRONGER INTEGRATION OF THE ANALYSIS MODEL APPROACH TO PROBLEM SOLVING. Because students often find it easier to identify a situation rather than a fundamental principle, this revision highlights the Analysis Model approach which lays out a standard set of situations that appear in most physics problems, and serves as a bridge to help students identify the correct fundamental principle—and then the equation—to utilize in solving that problem. As they gain more experience, students lean less on the Analysis Model approach and begin to identify fundamental principles directly, more in the manner the physicist does.

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The second edition of Physics for the Life Sciences brings the beauty of physics to life. Taking an algebra-based approach with the selective use of calculus, the second edition provides a concise approach to basic physics concepts using a fresh layout, consistent and student-tested art program, extensive use of conceptual examples, analytical problems, and instructive and engaging case studies.

**NEW TO THIS EDITION**

- Over 400 new end-of-chapter questions
- New concept-styled case studies that include solutions.
- Over 600 full colour illustrations, 200 photographs and over 1000 conceptual and analytical problems allow students to visualize the material and practice and apply what they have learned.
- Math Review section has been increased to include calculus reviews where necessary, and has been moved to the back of the text as a perforated pull-out section.

**FEATURES**

- Clear, concise, coverage of basic physics concepts.
- In-depth coverage of biomechanical and electrical physics content allows a better understanding of locomotion and the physics involved in cardiac function.
- The intensive use of conceptual questions in addition to quantitative problems. These provide students with conceptual understanding and analytical skills that are developed with numerous in-text questions and examples.
- Physics presented as an integral part of the Life
Sciences allowing for a seamless transition into Chemistry, Biology and Physiology
• A consistent storyline written within a life science context
• Relevant and applicable material with real values and quantitative figures

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Part Six: Applied Clinical Physics
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Chapter 27: Nuclear Magnetic Resonance

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PHYSICS LABORATORY EXPERIMENTS, 8E
Jerry D. Wilson, Lander College; Cecilia A. Hernández-Hall, American River College

This market-leading manual for the first-year physics laboratory course offers a wide range of class-tested experiments designed specifically for use in small to mid-size lab programs. A series of integrated experiments emphasizes the use of computerized instrumentation and includes a set of “computer-assisted experiments” that allow students and instructors to gain experience with modern equipment. It also lets instructors determine the appropriate balance of traditional versus computer-based experiments for their courses. By analyzing data through two different methods, students gain a greater understanding of the concepts behind the experiments. The Eighth Edition is updated with four new economical labs to accommodate shrinking department budgets and thirty new Pre-Lab Demonstrations, designed to capture students’ interest prior to the lab and requiring only widely available materials and items.

NEW TO THIS EDITION
• Four new lab experiments, designed to be economical, accommodate shrinking department budgets: The Scientific Method and Thought; Simple Pendulum Parameters [Angle, Mass, Length, and Damping]; Potential Energy of a Spring; Rotational Kinetic Energy and Moment of Inertia.
• Thirty new Pre-Laboratory Demonstrations capture student interest by demonstrating relevant physical principles using everyday materials. Examples include: Skewed Balloon (and it doesn't burst); Mixed Liquids Become More Dense; Problem in Math Analysis (can 2 equal 1?); Bucket Swing (what keeps the water in the pail?); The Slinky Slinky® (why doesn't it fall?).
FEATURES

- The standard manual includes ten experiments integrating computerized and traditional instruction, with components that can be used independently of one another or in combination for maximum flexibility. An additional four integrated experiments are available for custom orders.

- Customize the manual to include any combination of experiments that best suits your course, including the commonly used experiments featured in the standard text and additional experiments available through COMPOSE.

- Each experiment includes six components designed to aid students in their analysis and interpretation and to support a consistent and proven instructional approach: Advance Study Assignment, Introduction and Objectives, Equipment Needed, Theory, Experimental Procedures, and Laboratory Report and Questions.

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PHYSICS LABORATORY EXPERIMENTS, INTERNATIONAL EDITION, 7E

Jerry D. Wilson, Lander College; Cecilia A. Hernández-Hall, American River College

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data through two different methods, students gain a greater understanding of the concepts behind the experiments. The Seventh Edition is updated with the latest information and techniques involving state-of-the-art equipment, and a new Guided Learning feature addresses the growing interest in guided-inquiry pedagogy. Fourteen additional experiments are also available through custom printing.

NEW TO THIS EDITION

- The Seventh Edition features extensively updated computerized-instruction guidelines and techniques, allowing students and instructors to take full advantage of the latest equipment. The option to analyze data through multiple methods also enables students to enhance their understanding of key physics concepts.
- A series of seven guided-inquiry experiments reflects a growing interest in this increasingly popular approach to first-year physics instruction, giving instructors another effective and appealing option for engaging today’s students.
- An additional 14 custom lab experiments are available for instructors who want to expand or personalize their courses by introducing new topics or providing students with further opportunities to explore key concepts.

FEATURES

- The standard manual includes 10 experiments integrating computerized and traditional instruction, with components that can be used independently of one another or in combination for maximum flexibility. An additional four integrated experiments are available for custom orders.
- Instructors can customize the manual to include any combination of experiments that best suits their course, including 35 commonly used experiments featured in the standard text and an additional 14 experiments available online.
- Each experiment includes six components designed to aid students in their analysis and interpretation and to support a consistent and proven instructional approach: Advance Study Assignment, Introduction and Objectives, Equipment Needed, Theory, Experimental Procedures, and Laboratory Report and Questions.

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NEW TO THIS EDITION

• In response to instructor feedback, Loyd’s PHYSICS LABORATORY MANUAL, 4E, International Edition has been revised to include new unit conversion columns in many of the data and calculation tables, as well as a simplified experimental procedure that incorporates the calculations that accompany the procedure. Sample calculations have been removed, and five computer-assisted data entry labs are now available in the print manual.
• New Virtual Physics Labs, based on the Loyd PHYSICS LABORATORY MANUAL, 4E, International Edition, will soon be available. This will provide instructors with three options: a print/online hybrid lab manual, an online-only lab manual, and, of course, the print-only lab manual.

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• Each experiment includes a full discussion of relevant theory to help bolster conceptual understanding.
• The manual contains complete pre-lab assignments.
• Each experiment contains templates for data collection, a complete listing of materials for each lab, and clear step-by-step instructions.
• Distinction between calculated and measured data is reinforced throughout the manual.
• Statistical analysis is required in many of the labs.
• An extensive Instructor's Manual includes sample data for verification of procedures and equipment.

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PRE-UNIVERSITY PHYSICS VOLUME 1, 3E
Nor Sabirin Mohamed, University of Malaya; Izlina Supa’at; Norazlin Zainal, University of Malaya

FEATURES
• Suitable of Matriculation, STPM and Pre-University courses.
• Simple and clear presentation of information with large set of worked-out examples.
• An extensive collection of problems at the end of each chapter.
• Full colored illustration with explanations to ease understanding
• Prepared by a group of experienced academicians.

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1. Physical Quantities and Measurements
2. Kinematics: Speed, Velocity and Acceleration
3. Force, Momentum and Impulse
4. Work, Energy and Power
5. Dynamics and
PRINCIPLES OF PHYSICS, 5E
A Calculus-Based Text, International Edition
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• NOW AVAILABLE WITH CENGAGE YOUBOOK! This an interactive, easily customizable eBook, delivered via Enhanced WebAssign, lets you personalize the text content to fit your course and connect with your students. Personalize the book by removing and rearranging chapters in the table of contents, tailoring assigned readings that match your syllabus exactly, or editing narrative content in the book by adding a text box or striking out text. The Cengage YouBook also boosts students’ experience with the book by letting them highlight text, add their own notes, and insert bookmarks. Animations and videos play right on the page at the point of learning so that they’re not speed bumps to reading but true enhancements. Self-check quizzes in the printed textbook come to life with instant grading.
• LINE-BY-LINE REVISION OF THE QUESTIONS AND PROBLEMS SET. Assisted by the user data gathered by WebAssign, the authors reviewed each Question and Problem line-by-line to improve both readability and assignability. This extensive revision involved editing problems for clarity, editing for length, introducing better problem architecture by breaking up problems into clearly defined parts, and revising to make problems clearer to both professors and students.
• REVISION OF WORKED EXAMPLES. All in-text “Worked Examples” have been recast and are now presented in a two-column format to better reinforce physical concepts and provide conceptual explanations next to the math for every step. Solutions are presented symbolically as much as possible and only substituting in numbers at the last possible moment. This approach helps students think symbolically when they solve problems, instead of automatically looking to insert numbers into an equation to solve a problem. The examples closely follow the authors’ proven “General Problem Solving Strategy,” which is introduced in Chapter 1 to reinforce good problem-solving habits. About one-third of the worked examples include “What If?” extensions that further reinforce conceptual understanding. Every “Worked Example” can be assigned and graded through the Enhanced WebAssign homework management system.
• TWO NEW CONTEXTS FEATURES. Two new Contexts features were added to the “Physics in Context” organization of the text. Context 4 (Ch. 15) now addresses the issue of heart attacks, while Context 7 (Ch. 22-23) now covers the use of magnetism in medicine.
• THOROUGH REVISION OF ARTWORK. Every piece of artwork in the Fifth Edition was revised in a new and modern style that helps express the physics principles as well as making certain that the physical situations
The situation described is not possible.

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NEW TO THIS EDITION

• NOW AVAILABLE WITH CENGAGE YOUBOOK! This an interactive, easily customizable eBook, delivered via Enhanced WebAssign, lets you personalize the text content to fit your course and connect with your students. Personalize the book by removing and rearranging chapters in the table of contents, tailoring assigned readings that match your syllabus exactly, or editing narrative content in the book by adding a text box or striking out text. The Cengage YouBook also boosts students’ experience with the book by letting them highlight text, add their own notes, and insert bookmarks. Animations and videos play right on the page at the point of learning so that they’re not speed bumps to reading but true enhancements. Self-check quizzes in the printed textbook come to life with instant grading.

• LINE-BY-LINE REVISION OF THE QUESTIONS AND PROBLEMS SET. Assisted by the user data gathered by WebAssign, the authors reviewed each Question and Problem line-by-line to improve both readability and assignability. This extensive revision involved editing problems for clarity, editing for length, introducing better problem architecture by breaking up problems into clearly defined parts, and revising to make problems clearer to both professors and students.

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• BIOMEDICAL APPLICATIONS. For biology and pre-med students, “BIO” icons highlight practical and interesting applications of physical principles to biology and medicine. More life-science applications
in the problems sets and worked examples are also included in this new edition.

- **REVISED QUESTIONS SET ORGANIZATION.** The organization of the questions set has been completely overhauled by the authors. The “Questions” section is now divided into two sections: “Objective Questions” and “Conceptual Questions.”

- **OBJECTIVE QUESTIONS.** “Objective Questions” are multiple-choice, true/false, ranking, or other multiple-guess-type questions. Some require calculations designed to facilitate students’ familiarity with the equations, the variables used, the concepts the variables represent, and the relationships between the concepts. Others are more conceptual in nature and are designed to encourage conceptual thinking.

- **Conceptual Questions – Improve student comprehension with these short-answer and essay-type questions that require students to think conceptually about a physical situation.**

- **NEW PROBLEM TYPES.** Four new problem types have been introduced for this edition: “Quantitative/Conceptual” problems contain parts that ask students to think both quantitatively and conceptually. “Symbolic” problems ask students to solve a problem using only symbolic manipulation. Reviewers asked us specifically to increase the amount of symbolic problems found in the text, as this better reflects the way they want their students to think when solving physics problems. “Guided” problems break a standard problem into smaller steps, helping students grasp all the concepts and strategies required to arrive at a correct solution. “Impossibility” problems begin with the phrase, “Why is the following situation impossible?” and then describe a physical situation. A student must determine what questions need to be asked and what calculations need to be performed; based on the results the student must determine why the situation described is not possible.

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r e l e v a n t s h e e t s, t a i l o r i n g
assigned readings that match your syllabus exactly, or editing narrative content in the book by adding a text box or striking out text. The Cengage YouBook also boosts students' experience with the book by letting them highlight text, add their own notes, and insert bookmarks. Animations and videos play right on the page at the point of learning so that they're not speed bumps to reading but true enhancements. Self-check quizzes in the printed textbook come to life with instant grading. 

- **LINE-BY-LINE REVISION OF THE QUESTIONS AND PROBLEMS SET.** Assisted by the user data gathered by WebAssign, the authors reviewed each Question and Problem line-by-line to improve both readability and assignability. This extensive revision involved editing problems for clarity, editing for length, introducing better problem architecture by breaking up problems into clearly defined parts, and revising to make problems clearer to both professors and students. 

- **REVISION OF WORKED EXAMPLES.** All in-text “Worked Examples” have been recast and are now presented in a two-column format to better reinforce physical concepts and provide conceptual explanations next to the math for every step. Solutions are presented symbolically as much as possible and only substituting in numbers at the last possible moment. This approach helps students think symbolically when they solve problems, instead of automatically looking to insert numbers into an equation to solve a problem. The examples closely follow the authors' proven “General Problem Solving Strategy,” which is introduced in Chapter 1 to reinforce good problem-solving habits. About one-third of the worked examples include “What If?” extensions that further reinforce conceptual understanding. Every “Worked Example” can be assigned and graded through the Enhanced WebAssign homework management system. 

- **TWO NEW CONTEXTS FEATURES.** Two new Contexts features were added to the “Physics in Context” organization of the text. Context 4 (Ch. 15) now addresses the issue of heart attacks, while Context 7 (Ch. 22-23) now covers the use of magnetism in medicine. 

- **THOROUGH REVISION OF ARTWORK.** Every piece of artwork in the Fifth Edition was revised in a new and modern style that helps express the physics principles as well as making certain that the physical situations presented corresponded exactly to the textual discussion at hand. “Focus Pointers,” a new feature for many pieces of art, either point out important aspects of a figure or guide students through a process illustrated by the artwork or photo. This new art style also helps those students who are visual learners. 

- **BIOMEDICAL APPLICATIONS.** For biology and pre-med students, “BIO” icons highlight practical and interesting applications of physical principles to biology and medicine. More life-science applications in the problems sets and worked examples are also included in this new edition. 

- **REVISED QUESTIONS SET ORGANIZATION.** The organization of the questions set has been completely overhauled by the authors. The “Questions” section is now divided into two sections: “Objective Questions” and “Conceptual Questions.”

- **OBJECTIVE QUESTIONS.** “Objective Questions” are multiple-choice, true/false, ranking, or other multiple-guess-type questions. Some require calculations designed to facilitate students' familiarity with the equations, the variables used, the concepts the variables represent, and the relationships between the concepts. Others are more conceptual in nature and are designed to encourage conceptual thinking.

- **Conceptual Questions — Improve student comprehension with these short-answer and essay-type questions that require students to think conceptually about a physical situation.**

- **NEW PROBLEM TYPES.** Four new problem types have been introduced for this edition: “Quantitative/Conceptual” problems contain parts that ask students to think both quantitatively and conceptually. “Symbolic” problems ask students to solve a problem using only symbolic manipulation. Reviewers asked us specifically to increase the amount of symbolic problems found in the text, as this better reflects the way they want their students to think when solving physics problems. “Guided” problems break a standard problem into smaller steps, helping students grasp all the concepts and strategies required to arrive at a correct solution. “Impossibility” problems begin with the phrase, “Why is the following situation impossible?” and then describe a physical situation. A student must determine what questions need to be asked and what calculations need to be performed; based on the results the student must determine why the situation described is not possible.

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STUDENT SOLUTIONS MANUAL WITH STUDY GUIDE, VOLUME 1 FOR SERWAY/VUILLE’S COLLEGE PHYSICS, 10E
Raymond A. Serway, James Madison University (Emeritus); Chris Vuille, Embry-Riddle Aeronautical University

For Chapters 1-14, this manual contains detailed solutions to approximately twelve problems per chapter. These problems are indicated in the textbook with boxed problem numbers. The manual also features a skills section, important notes from key sections of the text, and a list of important equations and concepts.

© 2015, 256pp, Paperback, 9781285866260

STUDENT SOLUTIONS MANUAL WITH STUDY GUIDE, VOLUME 2 FOR SERWAY/VUILLE’S COLLEGE PHYSICS, 10E
Raymond A. Serway, James Madison University (Emeritus); Chris Vuille, Embry-Riddle Aeronautical University

For Chapters 15-30, this manual contains detailed solutions to approximately twelve problems per chapter. These problems are indicated in the textbook with boxed problem numbers. The manual also features a skills section, important notes from key sections of the text, and a list of important equations and concepts.

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STUDY GUIDE WITH STUDENT SOLUTIONS MANUAL, VOLUME 1 FOR SERWAY/JEWETT’S PHYSICS FOR SCIENTISTS AND ENGINEERS, 9E
Raymond A. Serway, James Madison University (Emeritus); John W. Jewett, California State Polytechnic University, Pomona

The perfect way to prepare for exams, build problem-solving skills, and get the grade you want! For Chapters 1-22, this manual contains detailed solutions to approximately 20% of the problems per chapter (indicated in the textbook with boxed problem numbers). The manual also features a skills section,
important notes from key sections of the text, and a list of important equations and concepts.

© 2014, 416pp, Paperback, 9781285071688

STUDY GUIDE WITH STUDENT SOLUTIONS MANUAL, VOLUME 2 FOR SERWAY/JEWETT’S PHYSICS FOR SCIENTISTS AND ENGINEERS, 9E
Raymond A. Serway, James Madison University (Emeritus); John W. Jewett, California State Polytechnic University, Pomona

The perfect way to prepare for exams, build problem-solving skills, and get the grade you want! For Chapters 23-46, this manual contains detailed solutions to approximately 20% of the problems per chapter (indicated in the textbook with boxed problem numbers). The manual also features a skills section, important notes from key sections of the text, and a list of important equations and concepts.

© 2014, 608pp, Paperback, 9781285071695

NEW TO THIS EDITION
• New features include new and revised content for better clarity and depth of information to support student understanding of key concepts, including:
• Heat transfer basics are discussed in Chapters 4 and 5, then applied to questions of how to keep the heat in your house (Chapter 5) and solar heating (Chapter 6).
• Basic electricity (circuits, statics) are discussed in Chapter 10 and applied to electric-powered vehicles (EVs) (Chapter 10) and photovoltaic (PV) and wind situations (Chapter 12).
• Conservation of energy is developed in Chapters 2 and 3 and applied to energy examples of power plants and
houses in Chapters 3 and 4.

- Throughout initial chapters, examples of energy use in developing countries are used in Focus-On boxes: China (Chapter 1), India (Chapter 2), less developed countries (Chapter 3); and a look at air pollution (Chapter 8).

- Basic ideas are strengthened through Activities that students can complete at home or in class. Examples include Energy Mechanics (Newton's Laws - Activity 2.2), Energy Conservation (Activity 3.1), Heat Transfer (Activity 5.1), Solar Collectors (Activity 6.2), and Electricity Statics (Activity 10.1).

- Current design of nuclear power plants is discussed in Chapter 14, and the uses of radiation is discussed in Chapter 15 in a non-biased way.

**FEATURES**

- The “How Would You Choose” feature emphasizes the impact that energy issues have on personal affairs and electoral patterns. Introduced at the start of each chapter and revisited at the chapter’s end, this feature asks students to create and support a valid critical argument on a relevant energy issue.

- Fully revised and updated to reflect the most current material, including: the impact of the 2011 earthquake and tsunami in Japan, the 2005 U.S. energy policy bill, increased ethanol production from corn, the reawakening of nuclear power, new information on fuel cells and hydrogen economy, and an expanded discussion on global warming.

- The authors integrate the complex questions of energy policy and possible energy strategies. There are no simple answers or single alternatives that can provide all of our energy needs, preserve our economic prosperity, and protect our environment. Hence, questions (many unanswered) are brought up throughout the book to encourage readers to critically think ahead and begin to develop their own solutions.

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**INQUIRY INTO PHYSICS, INTERNATIONAL EDITION, 7E**

Vern J. Ostdiek, Benedictine College, Atchison, KS; Donald J. Bord, University of Michigan, Dearborn

INQUIRY INTO PHYSICS, 7E, International Edition continues its strong emphasis on the inquiry approach to learning physics. Throughout, students are asked to try things, to discover relationships between physical quantities on their own, and to look for answers in the world around them and not seek them only in books or on the Internet. Some of the pedagogical tools this text utilizes to build conceptual understanding and inquiry-based learning include the Explore It Yourself boxes, Concept Maps integrated throughout each chapter, and periodic Learning Check conceptual quizzes. The text periodically reviews the historical development of physics, which is particularly relevant as context for non-science majors. Simple mathematics is integrated into the text so students can see the practicality of physics and have a means of testing scientific validity.
NEW TO THIS EDITION

• NOW AVAILABLE WITH CENGAGE YOUBOOK! This an interactive, easily customizable eBook, delivered via Enhanced WebAssign, lets you personalize the text content to fit your course and connect with your students. Personalize the book by removing and rearranging chapters in the table of contents, tailoring assigned readings that match your syllabus exactly, or editing narrative content in the book by adding a text box or striking out text. The Cengage YouBook also boosts students’ experience with the book by letting them highlight text, add their own notes, and insert bookmarks. Animations and videos play right on the page at the point of learning so that they’re not speed bumps to reading but true enhancements. Self-check quizzes in the printed textbook come to life with instant grading.

• UPDATED WITH THE LATEST IN THE FIELD. The text has been updated with the most current information on scientific discoveries and achievements, including newly discovered chemical elements, recent advances in particle physics (e.g., current status and results from experiments with the Large Hadron Collider) and cosmology, an expanded discussion of entropy, the latest developments in superconductivity studies, a review of the circumstances and status of the Japanese nuclear disaster of March 2011, and an up-to-date list of Nobel Prize award recipients in physics.

• NATURAL PHENOMENA APPLICATIONS – This new edition uses a broad range of applications of physics principles as seen in natural phenomena such as thunder and lightning storms, rainbows and sundogs, auroras, the greenhouse effect, geomagnetism, and more to better engage non-science majors with real world events they can relate with.

• NEW QUESTIONS AND PROBLEMS – More than 50 new questions and problems in each end-of-chapter provide instructors more flexibility in tailoring assignments to their course needs. “Explore-It-Yourself” application boxes feature clearer instructions and outcomes to better support students studying on their own.

• ENHANCED INSTRUCTOR TOOLS. The multimedia manager CD-ROM/DVD includes an instructor support package that includes lecture presentation resources to aid in course preparation.

• CONCISE, STRUCTURED CONTENTS. With just 12 chapters, INQUIRY INTO PHYSICS, 7th Edition, is 1/3 the size of competing texts, making it perfect for instructors who are looking for a text structured in a traditional “chapter-a-week” format.

FEATURES

• EMPHASIS ON MODERN APPLICATIONS. An emphasis on modern applications of physics to such devices as iPods and iPads, airport metal detectors, in-home smoke detectors, radar ‘guns,’ plasma TVs, fiber optics probes, PET scanners, lasers, and more engage students and show them the relevance of physics in our daily lives.

• ENHANCED WEBASSIGN. Selected end-of-chapter problems are available in Enhanced WebAssign, the most utilized homework system in physics, allowing you to securely create and administer homework assignments in an interactive online environment. Designed by physicists for physicists, this system is a trusted companion to your teaching.

• INQUIRY-BASED APPROACH. Explore It Yourself boxes encourage students to ask questions, and let them try a hands-on activity—and draw conclusions based on their observations—before proceeding to the textual discussion of the principles of physics involved.

• CONCEPT MAPS. Concept Maps in each chapter visually summarize abstract concepts, helping students link key concepts, processes, and systems in an easy-to-follow flowchart format. Between one and three of these maps appear in each chapter. And each chapter opens with a flowchart outlining all of the key concepts to be covered in that chapter, facilitating student review.

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© 2013, 576pp, Paperback, 9781133109952
Designed specifically for non-majors, PHYSICS: A CONCEPTUAL WORLD VIEW, International Edition, provides an engaging and effective introduction to physics using a flexible, fully modular presentation ideal for a wide variety of instructors and courses. Incorporating highly effective Physics Education Research pedagogy, the text features an ongoing storyline describing the development of the current physics “world view,” which provides students with an understanding of the laws of nature and the context to better appreciate the importance of physics. The text’s appealing style and minimal use of math also help to make complex material interesting and easier to master, even for students intimidated by physics or math. For instructors who want to incorporate more problem-solving skills and quantitative reasoning, the optional, more detailed, “Problem Solving to Accompany PHYSICS: A CONCEPTUAL WORLD VIEW” student supplement reveals more of the beauty and power of mathematics in physics. The text can also be customized to fit any syllabus through Cengage Learning’s TextChoice custom solution program. In addition, the new Seventh Edition includes a thoroughly revised art program featuring elements such as balloon captions and numerous illustrations to help students better visualize and understand key concepts.

NEW TO THIS EDITION
• For the Seventh Edition, the authors reconsidered every piece of art, replaced numerous photographs, added elements such as balloon captions and force arrows, and converted human figures to a fun new Stick Man format, all to ensure greater clarity, consistency, and functionality for readers.
• The new edition includes nearly twice as many “Working It Out” boxes throughout the text to provide optional math instruction as a complement to more conceptual material, as well as new and revised end-of-chapter Conceptual Questions and Exercises, many of them now coded into the WebAssign system.
• Nearly 90 new conceptual questions within “Everyday Physics” boxes throughout the text offer a simple way to assign homework and to help students appreciate the countless connections between physics and their everyday lives.
• Many chapters feature expanded or updated content, including an extended discussion of free-body diagrams (a critical first step in every mechanics problem), a more intuitive presentation of vector changes, an exploration of linear mechanics through the context of rotational mechanics, and the use of more common definitions and standards.

FEATURES
• This text provides a novel introduction to physics that appeals even to non-majors and those intimidated by math or physics by using an engaging, running storyline about how the current physics “world view” developed and its importance in students’ everyday lives.
• Fully modular, the text can be tailored easily to fit your interests or syllabus by emphasizing any of seven thematic paths through the ongoing storyline, or by customizing the text completely with the Cengage Learning TextChoice program.
• “Flawed Reasoning” boxes pose common student misconceptions and explain the errors in reasoning in a casual question/answer format, encouraging students to overcome barriers to conceptual understanding without intimidating them.
• Optional math content is presented throughout the text in more than 50 thoroughly revised “Working It Out” boxes, allowing for convenient use by interested instructors and students, while enabling others to easily skip this material. Special icons also highlight mathematical material appearing in the “Problem Solving” student supplement.
• “On the Bus” questions and answers appear at key points throughout each chapter to stimulate thinking and allow students to check whether they are “on the bus” with a working understanding of key concepts.
before moving on to subsequent material.

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© 2010, 688pp, Hardback, 9780495560050

PHYSICS (WITH REVIEW CARD AND PHYSICS COURSEMATE WITH EBOOK PRINTED ACCESS CARD)

Vern J. Ostdiek, Benedictine College, Atchison, KS; Donald J. Bord, University of Michigan, Dearborn

Card

Created through a “student-tested, faculty-approved” review process, PHYSICS is an engaging and accessible solution to accommodate the diverse lifestyles of today’s learners at a value-based price. PHYSICS maintains the perfect balance of quantitative and conceptual content by carefully incorporating problem solving into a discernible conceptual framework. Accompanying PHYSICS is a full supplemental package, including an Instructor’s Manual available Online or on the PowerLecture CD. Also included on the PowerLecture CD are PowerPoint® Presentations, and a Test Bank available in the easy to use and versatile ExamView® format. With these lecture planning aids, PHYSICS is as accommodating to instructor’s as it is to students.

FEATURES

• An innovative combination of content delivery both in print and online provides a core text and a wealth of comprehensive multimedia teaching and learning assets based on input from student focus groups and surveys, and from interviews with faculty and students.
• Shorter, comprehensive chapters in a modern design present content in a more engaging and accessible format without minimizing coverage for your course.
• Chapter In Review Cards at the back of the Student Editions provide students a portable study tool containing all of the pertinent information for class preparation.
• Instructor Prep Cards at the back of the Instructor’s Edition make preparation simple with detachable cards for each chapter, offering a quick map of chapter content, a list of corresponding PowerPoint® and video resources, additional examples, and suggested assignments and discussion questions to help you organize chapter content efficiently.
• A full suite of unique learning tools that appeal to different learning styles is available to students with the purchase of a new book. Interactive Quizzes, simulations, and interactive and printable flashcards.
• All of the content and resources you expect with a supplements package that is second to none, including PowerPoint® Lecture Outlines, iImages from the text in JPG and PowerPoint® format, online homework through WebAssign, simulations, interactive flashcards, online glossary, additional essays only available online, and test bank.
• Maintains the perfect balance of quantitative and conceptual content by carefully incorporating problem solving into a discernible conceptual framework.

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1. The Study of Motion. 2. Newton’s Laws. 3. Energy and
From the mechanics of walking up a flight of stairs to how smart phones work, physics touches our everyday lives. However, too many students are either intimidated or not interested in it; it is our goal to change that. Physics for Scientists and Engineers: An Interactive Approach provides a relevant approach to the subject to match the Canadian curriculum and better reflect this fundamental, multidisciplinary, inquisitive, and inspirational science as it applies to Canadian students and instructors. Taking a PER-based (Physics Education Research) approach, the text draws from the best examples and applications from around the world to present physics as the creative process it is, and to help the reader feel the thrill of discovery.

FEATURES

• Each Example is numbered and corresponds to each major concept introduced in the section. Examples include a statement of problem, solution and making sense of the result. Within the example the authors have modeled desired traits such as care with units and consideration of appropriate significant figures.
• Learning Objectives are numbered, directive, and brief goals or outcomes that the student should take away from the chapter. Each Learning Objective corresponds to a major heading within the chapter.
• Major Sections are directly tied to Learning Objectives and visually indicate section elements via individually icons.
• Making sense of the result – found in each example, the authors model the idea of always considering what has been calculated to determine if it is reasonable. A key part of the scientific process.
• Online Activity Boxes provide interactive activities such as computer simulations which will help with concept development. Many of these are matched to the physics education research validated PhETs,
• Written by students for students, Peer to Peer boxes provide useful tips for navigating difficult concepts.
• Key Equations are clearly indicated to help students differentiate fundamental relationships from those which are used in steps of derivations or examples.
• Look Ahead Sections at the beginning of each chapter introduce topics through an interesting and engaging real-life example that pertains to the chapter's subject matter. Each Look Ahead section is illustrated with an engaging photo.
• Checkpoint Boxes for each Learning Objective. Checkpoint Boxes test student's understanding of the material they have just read; include questions in different formats, followed immediately by the answer placed upside-down at the end of the box.
• Making Connections boxes are provided in a narrative format and contain concise examples from international, historical, daily life, and other sciences.

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MODERN PHYSICS

MODERN PHYSICS FOR SCIENTISTS AND ENGINEERS, INTERNATIONAL EDITION, 4E

Stephen T. Thornton, University of Virginia; Andrew Rex, University of Puget Sound

MODERN PHYSICS, 4E, International Edition presents the latest discoveries in physics, and offers a contemporary and comprehensive approach with a strong emphasis on applications. In order to illustrate the process behind scientific advances and give students a historical perspective, the authors discuss the experiments that led to key discoveries covered in the text. A flexible organization allows you to select and teach topics in your preferred sequence without compromising your student's learning experience. A sound theoretical foundation in quantum theory is included to help physics majors succeed in their upper division courses.

NEW TO THIS EDITION

- This new edition features revised sections on Neutrino Oscillations, Matter-Antimatter, and Grand Unifying Theories (in Chapter 14) along with Chapter 15's new Special Topic box on Gravitational Wave Detection for expanded coverage of topics and improved clarity.
- Chapter 16 features a new section on “The Standard Model of Cosmology,” a new sub-section on “Olber's Paradox,” and a revised and updated Special Topic box on the “Future of Space Telescopes.”
- In order to keep the text fresh and current, a variety of the questions and problems are completely new to this edition.

FEATURES

- Updates on experiments and discoveries in each chapter keep the text interesting and timely.
- A large number of examples, including the Conceptual Examples introduced in the last edition, give students ample practice applying the theories they read about in the text. Examples feature a Strategy step, which helps students identify the essential steps in problem solving and improve their problem-solving skills.
- Chapter 16, “Cosmology,” has been rewritten to reflect the latest research and findings and expose students to this rapidly changing body of knowledge.
- The authors illustrate the importance of individual ingenuity throughout the book with short biographical features highlighting the achievements of physicists throughout history.
- A flexible organization of content makes this text appropriate for a one- or two-semester course, giving you a choice of topics without compromising overall student learning. The authors begin by laying the historical groundwork for modern physics and then go on to in-depth coverage of relativity and quantum mechanics. The latter part of the book is devoted to the sub-fields of physics (atomic, condensed matter, nuclear and particle) along with general relativity and cosmology. This organization gives you a solid foundation for the course early in the book, and then lets you draw from the later chapters of the book to
enhance your teaching with additional topics of your choosing.

• Throughout the text, a focus on the history of physics offers a human perspective and helps students understand the context in which scientific advancements have been made.

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PRE-UNIVERSITY PHYSICS
Volume 2
Nor Sabirin Mohamed, University of Malaya; Azizan Ismail, University of Malaya; Izlina Supa’at, University of Malaya; Hashlina Rusdi, University of Malaya

FEATURES
- Suitable for Matriculation, STPM and Pre-U courses
- Large set of worked-out examples
- An extensive collection of problems at the end of chapter
- Four-colored illustration with explanations to ease understanding
- Prepared by a group of experienced academicians

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© 2006, 420pp, Paperback, 9789812654236

STUDENT SOLUTIONS MANUAL FOR THORNTON/REX’S MODERN PHYSICS FOR SCIENTISTS AND ENGINEERS, 4TH, 4E
Stephen T. Thornton, University of Virginia; Andrew Rex, University of Puget Sound

The student solutions manual contains detailed solutions to approximately 25% of the end-of-chapter problems.

© 2013, 88pp, Paperback, 9781133112198

SPECIALIZED COURSES

CLASSICAL DYNAMICS OF PARTICLES AND SYSTEMS, INTERNATIONAL EDITION, 5E
Stephen T. Thornton, University of Virginia; Jerry B. Marion, Late of University of Maryland

This best-selling classical mechanics text, written for the advanced undergraduate one- or two-semester course, provides a complete account of the classical mechanics of particles, systems of particles, and rigid bodies. Vector calculus is used extensively to explore topics. The Lagrangian formulation of mechanics is introduced.
early to show its powerful problem solving ability. Modern notation and terminology are used throughout in support of the text's objective: to facilitate students' transition to advanced physics and the mathematical formalism needed for the quantum theory of physics. CLASSICAL DYNAMICS OF PARTICLES AND SYSTEMS can easily be used for a one- or two-semester course, depending on the instructor's choice of topics.

NEW TO THIS EDITION

- New problems and examples have been added to provide students with ample opportunity to master the material.
- The Fifth Edition features a classic and accessible design to engage today's visually oriented students.
- To reinforce and enhance the connection between important content points and supporting visuals, new FIGURE CAPTIONS accompany the text art.

FEATURES

- Written for maximum flexibility, this best-selling junior level mechanics text is easily adaptable to any length--one- or two-semester--or focus of course.
- LAGRANGIAN and HAMILTONIAN DYNAMICS are introduced early in the text.
- This text has an entire chapter on NONLINEAR METHODS.
- NUMERICAL METHODS PROBLEMS are included for students to solve using a computer.

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in developing countries are used in Focus-On boxes: China (Chapter 1), India (Chapter 2), less developed countries (Chapter 3); and a look at air pollution (Chapter 8).

• Basic ideas are strengthened through Activities that students can complete at home or in class. Examples include Energy Mechanics (Newton’s Laws - Activity 2.2), Energy Conservation (Activity 3.1), Heat Transfer (Activity 5.1), Solar Collectors (Activity 6.2), and Electricity Statics (Activity 10.1).

• Current design of nuclear power plants is discussed in Chapter 14, and the uses of radiation is discussed in Chapter 15 in a non-biased way.

FEATURES

• The “How Would You Choose” feature emphasizes the impact that energy issues have on personal affairs and electoral patterns. Introduced at the start of each chapter and revisited at the chapter’s end, this feature asks students to create and support a valid critical argument on a relevant energy issue.

• Fully revised and updated to reflect the most current material, including: the impact of the 2011 earthquake and tsunami in Japan, the 2005 U.S. energy policy bill, increased ethanol production from corn, the reawakening of nuclear power, new information on fuel cells and hydrogen economy, and an expanded discussion on global warming.

• The authors integrate the complex questions of energy policy and possible energy strategies. There are no simple answers or single alternatives that can provide all of our energy needs, preserve our economic prosperity, and protect our environment. Hence, questions (many unanswered) are brought up throughout the book to encourage readers to critically think ahead and begin to develop their own solutions.

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SOLID STATE PHYSICS

Neil W. Ashcroft, Cornell University; N. David Mermin, Cornell University

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© 1976, 848pp, Hardback, 9780030839931

SOLID STATE PHYSICS
Dan Wei, Tsinghua University

This is a concise solid state physics textbook written for undergraduate students majoring in materials science, electronics, or physics. It clarifies the philosophy underlying the various branches of solid state physics, explores the exciting and original ideas of great scientists, demonstrates the significance of the neat assumptions in theories, and exposes the complicated nature of solid state experiments. This book aims to guide students through a journey for the beauty amidst complexity, without missing the delicate thoughts contained in theories.

FEATURES

• Comprehensive coverage of book publishing as well as periodical, audio/visual, electronic, and online publishing in China. It not only includes a general introduction to the industry, but also representative case studies.
• The author traces the history of solid state physics in the discussion of chemical bonds and crystal formation, lattice vibration and phonon, magnetism and spin, dielectric constant and refraction index.
• An easy and student-friendly text, this book can be of great help to engineering and computer science students in view of the important role of Solid State Physics in modern technology: the energy band theory is essential to the understanding of CMOS in the computer processor unit.

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