

Astronomy A Physical Perspective Solutions Ebooks

An elementary university text about stars for introductory courses in astronomy and astrophysics.

From a star theoretical physicist, a journey into the world of particle physics and the cosmos—and a call for a more liberatory practice of science. Winner of the 2021 Los Angeles Times Book Prize in Science & Technology A Finalist for the 2022 PEN/E.O. Wilson Literary Science Writing Award A Smithsonian Magazine Best Science Book of 2021 A Symmetry Magazine Top 10 Physics Book of 2021 An Entropy Magazine Best Nonfiction Book of 2020-2021 A Publishers Weekly Best Nonfiction Book of the Year A Kirkus Reviews Best Nonfiction Book of 2021 A Booklist Top 10 Sci-Tech Book of the Year In The Disordered Cosmos, Dr. Chanda Prescod-Weinstein shares her love for physics, from the Standard Model of Particle Physics and what lies beyond it, to the physics of melanin in skin, to the latest theories of dark matter—along with a perspective informed by history, politics, and the wisdom of Star Trek. One of the leading physicists of her generation, Dr. Chanda Prescod-Weinstein is also one of fewer than one hundred Black American women to earn a PhD from a department of physics. Her vision of the cosmos is vibrant, buoyantly nontraditional, and grounded in Black and queer feminist lineages. Dr. Prescod-Weinstein urges us to recognize how science, like most fields, is rife with racism, misogyny, and other forms of oppression. She lays out a bold new approach to science and society, beginning with the belief that we all have a fundamental right to know and love the night sky. The Disordered Cosmos dreams into existence a world that allows everyone to experience and understand the wonders of the universe.

The book describes how the scientific account of the world arose among the Greeks and developed in the Middle Ages.

"The book introduces graduate students and young researchers of astronomy and physics to the techniques and methods of astronomical spectroscopy. It covers spectroscopic methods in all branches of astronomy, including optical astronomy, radio astronomy, and astronomy at X-ray and gamma-ray wavelengths. The book will also be of interest for engineers and technicians who are designing or operating optical and space instrumentation"--

21st Century Astronomy

Reprints - National Radio Astronomy Observatory, Green Bank, W. Va

An Introduction to the Sun and Stars

Future Space Problems and Their Solutions

A Journey into Dark Matter, Spacetime, and Dreams Deferred

Maximum Energy Dissipation Principle in Chemistry, Biology, Physics and Evolution

Astronomy is written in clear non-technical language, with the occasional touch of humor and a wide range of clarifying illustrations. It has many analogies drawn from everyday life to help non-science majors appreciate, on their own terms, what our modern exploration of the universe is revealing. The book can be used for either a one-semester or two-semester introductory course (bear in mind, you can customize your version and include only those chapters or sections you will be teaching.) It is made available free of charge in electronic form (and low cost in printed form) to students around the world. If you have ever thrown up your hands in despair over the spiraling cost of astronomy textbooks, you owe your students a good look at this one. Coverage and Scope Astronomy was written, updated, and reviewed by a broad range of astronomers and astronomy educators in a strong community effort. It is designed to meet scope and sequence requirements of introductory astronomy courses nationwide. Chapter 1: Science and the Universe: A Brief Tour Chapter 2: Observing the Sky: The Birth of Astronomy Chapter 3: Orbits and Gravity Chapter 4: Earth, Moon, and Sky Chapter 5: Radiation and Spectra Chapter 6: Astronomical Instruments Chapter 7: Other Worlds: An Introduction to the Solar System Chapter 8: Earth as a Planet Chapter 9: Cratered Worlds Chapter 10: Earthlike Planets: Venus and Mars Chapter 11: The Giant Planets Chapter 12: Rings, Moons, and Pluto Chapter 13: Comets and Asteroids: Debris of the Solar System Chapter 14: Cosmic Samples and the Origin of the Solar System Chapter 15: The Sun: A Garden-Variety Star Chapter 16: The Sun: A Nuclear Powerhouse Chapter 17: Analyzing Starlight Chapter 18: The Stars: A Celestial Census Chapter 19: Celestial Distances Chapter 20: Between the Stars: Gas and Dust in Space Chapter 21: The Birth of Stars and the Discovery of Planets outside the Solar System Chapter 22: Stars from Adolescence to Old Age Chapter 23: The Death of Stars Chapter 24: Black Holes and Curved Spacetime Chapter 25: The Milky Way Galaxy Chapter 26: Galaxies Chapter 27: Active Galaxies, Quasars, and Supermassive Black Holes Chapter 28: The Evolution and Distribution of Galaxies Chapter 29: The Big Bang Chapter 30: Life in the Universe Appendix A: How to Study for Your Introductory Astronomy Course Appendix B: Astronomy Websites, Pictures, and Apps Appendix C: Scientific Notation Appendix D: Units Used in Science Appendix E: Some Useful Constants for Astronomy Appendix F: Physical and Orbital Data for the Planets Appendix G: Selected Moons of the Planets Appendix H: Upcoming Total Eclipses Appendix I: The Nearest Stars, Brown Dwarfs, and White Dwarfs Appendix J: The Brightest Twenty Stars Appendix K: The Chemical Elements Appendix L: The Constellations Appendix M: Star Charts and Sky Event Resources

The advent of accessible student computing packages has meant that geophysics students can now easily manipulate datasets and gain first-hand modeling experience - essential in developing an intuitive understanding of the physics of the Earth. Yet to gain a more in-depth understanding of physical theory, and to develop new models and solutions, it is necessary to be able to derive the relevant equations from first principles. This compact, handy book fills a gap left by most modern geophysics textbooks, which generally do not have space to derive all of the important formulae, showing the intermediate steps. This guide presents full derivations for the classical equations of gravitation, gravity, tides, earth rotation, heat, geomagnetism and foundational seismology, illustrated with simple schematic diagrams. It supports students through the successive steps and explains the logical sequence of a derivation - facilitating self-study and helping students to tackle homework exercises and prepare for exams.

Designed for teaching astrophysics to physics students at advanced undergraduate or beginning graduate level, this textbook also provides an overview of astrophysics for astrophysics graduate students, before they delve into more specialized volumes. Assuming background knowledge at the level of a physics major, the textbook develops astrophysics from the basics without requiring any previous study in astronomy or astrophysics. Physical concepts, mathematical derivations and observational data are combined in a balanced way to provide a unified treatment. Topics such as general relativity and plasma physics, which are not usually covered in physics courses but used extensively in astrophysics, are developed from first principles. While the emphasis is on developing the fundamentals thoroughly, recent important discoveries are highlighted at every stage.

Astronomy is an observational science, renewed and even revolutionized by new developments in instrumentation. With the resulting growth of multiwavelength investigation as an engine of discovery, it is increasingly important for astronomers to understand the underlying physical principles and operational characteristics for a broad range of instruments. This comprehensive text is ideal for graduate students, active researchers and instrument developers. It is a thorough review of how astronomers obtain their data, covering current approaches to astronomical measurements from radio to gamma rays. The focus is on current technology rather than the history of the field, allowing each topic to be discussed in depth. Areas covered include telescopes, detectors, photometry, spectroscopy, adaptive optics and high-contrast imaging, millimeter-wave and radio receivers, radio and optical/infrared interferometry, and X-ray and gamma-ray astronomy, all at a level that bridges the gap between the basic principles of optics and the subject's abundant specialist literature. Color versions of figures and solutions to selected problems are available online at www.cambridge.org/9780521762298.

Solar System Dynamics

Introduction to Astronomical Spectroscopy

At Play in the Cosmos

Solutions Manual Astronomy a Physical Perspective

Series A.

What Stars Are Made Of

Written for advanced undergraduate and graduate students, this is a clear mathematical introduction to Einstein's theory of general relativity and its physical applications. Concentrating on the theory's physical consequences, this approachable textbook contains over 300 exercises to illuminate and extend the discussion.

Solutions Manual Astronomy a Physical PerspectiveAstronomy: A Physical PerspectiveCambridge University Press

We say that the processes going on in the world about us are asymmetric in time or display an arrow of time. Yet this manifest fact of our experience is particularly difficult to explain in terms of the fundamental laws of physics. This volume reconciles these profoundly conflicting facts.

A comprehensive introduction to astronomical objects and phenomena, for undergraduate students.

Astrophysics Processes

A Contemporary Approach

Introduction to Cosmology

An Introduction for Physicists

The Solar System

The Physics of Astronomical Phenomena

Bridging the gap between physics and astronomy textbooks, this book provides step-by-step physical and mathematical development of fundamental astrophysical processes underlying a wide range of phenomena in stellar, galactic, and extragalactic astronomy. The book has been written for upper-level undergraduates and beginning graduate students, and its strong pedagogy ensures solid mastery of each process and application. It contains over 150 tutorial figures, numerous examples of astronomical measurements, and 201 exercises. Topics covered include the Kepler–Newton problem, stellar structure, binary evolution, radiation processes, special relativity in astronomy, radio propagation in the interstellar medium, and gravitational lensing. Applications presented include Jeans length, Eddington luminosity, the cooling of the cosmic microwave background (CMB), the Sunyaev–Zeldovich effect, Doppler boosting in jets, and determinations of the Hubble constant. This text is a stepping stone to more specialized books and primary literature. Password-protected solutions to the exercises are available to instructors at www.cambridge.org/9780521846561.

A comprehensive and authoritative introduction to contemporary cosmology for advanced undergraduate and graduate students.

Fundamental Astronomy is a well-balanced, comprehensive introduction to classical and modern astronomy. While emphasizing both the astronomical concepts and the underlying physical principles, the text provides a sound basis for more profound studies in the astronomical sciences. This is the fifth edition of the successful undergraduate textbook and reference work. It has been extensively modernized and extended in the parts dealing with extragalactic astronomy and cosmology. You will also find augmented sections on the solar system and extrasolar planets as well as a new chapter on astrobiology. Long considered a standard text for physical science majors, Fundamental Astronomy is also an excellent reference work for dedicated amateur astronomers.

A textbook that is not written like a textbook.

AN INTRODUCTION TO ASTROPHYSICS

An Introduction to Modern Cosmology

Foundations of Astrophysics

Astronomy

A Treatise Upon Artificial Electricity, in which are Given Solutions of a Number of Interesting Electric Phenomena, Hitherto Unexplained. To which is Added, an Essay on the Mild and Slow Electricity which Prevails in the Atmosphere During Serene Weather. Translated from the Original Italian of Father Giambattista Beccaria ..

Knowledge Discovery in Big Data from Astronomy and Earth Observation

An Introduction to Modern Cosmology Third Edition is an accessible account of modern cosmological ideas. The Big Bang Cosmology is explored, looking at its observational successes in explaining the expansion of the Universe, the existence and properties of the cosmic microwave background, and the origin of light elements in the universe. Properties of the very early Universe are also covered, including the motivation for a rapid period of expansion known as cosmological inflation. The third edition brings this established undergraduate textbook up-to-date with the rapidly evolving observational situation. This fully revised edition of a bestseller takes an approach which is grounded in physics with a logical flow of chapters leading the reader from basic ideas of the expansion described by the Friedman equations to some of the more advanced ideas about the early universe. It also incorporates up-to-date results from the Planck mission, which imaged the anisotropies of the Cosmic Microwave Background radiation over the whole sky. The Advanced Topic sections present subjects with more detailed mathematical approaches to give greater depth to discussions. Student problems with hints for solving them and numerical answers are embedded in the chapters to facilitate the reader's understanding and learning. Cosmology is now part of the core in many degree programs. This current, clear and concise introductory text is relevant to a wide range of astronomy programs worldwide and is essential reading for undergraduates and Masters students, as well as anyone starting research in cosmology. The accompanying website for this text, <http://booksupport.wiley.com>, provides additional material designed to enhance your learning, as well as errata within the text.

A contemporary and complete introduction to astrophysics for astronomy and physics majors taking a two-semester survey course.

Funded by the National Science Foundation, Lecture-Tutorials for Introductory Astronomy is designed to help make large lecture-format courses more interactive with easy-to-implement student activities that can be integrated into existing course structures. The Second Edition of the Lecture-Tutorials for Introductory Astronomy contains nine new activities that focus on planetary science, system related topics, and the interactions of Light and matter. These new activities have been created using the same rigorous class-test development process that was used for the highly successful first edition. Each of the 38 Lecture-Tutorials, presented in a classroom-ready format, challenges students with a series of carefully designed questions that spark classroom discussion, engage students in critical reasoning, and require no equipment. The Night Sky: Position, Motion, Seasonal Stars, Solar vs. Sidereal Day, Ecliptic, Star Charts, Fundamentals of Astronomy: Kepler's 2nd Law, Kepler's 3rd Law, Newton's Laws and Gravity, Apparent and Absolute Magnitudes of Stars, The Parse, Parallax and Distance, Spectroscopic Parallax. Nature of Light in Astronomy: The Electromagnetic (EM) Spectrum of Light, Telescopes and Earth's Atmosphere, Luminosity, Temperature and Size, Blackbody Radiation, Types of Spectra, Light and Atoms, Analyzing Spectra, Doppler Shift. Our Solar System: The Cause of Moon Phases, Predicting Moon Phases, Path of Sun, Seasons, Observing Retrograde Motion, Earth's Changing Surface, Temperature and Formation of Our Solar System, Sun Size. Stars Galaxies and Beyond: H-R Diagram, Star Formation and Lifetimes, Binary Stars, The Motion of Extrasolar Planets, Stellar Evolution, Milky Way Scales, Galaxy Classification, Looking at Distant Objects, Expansion of the Universe. For all readers interested in astronomy.

A practical answer guide to humankind's age-old questions on planets, our universe and everything beyond and between.

Fundamental Astronomy

Orbital Motion

Physical Origins of Time Asymmetry

General Relativity

A Historical Introduction

Atomic Astrophysics and Spectroscopy

*Long established as one of the premier references in the fields of astronomy, planetary science, and physics, the fourth edition of Orbital Motion continues to offer comprehensive coverage of the analytical methods of classical celestial mechanics while introducing the recent numerical experiments on the orbital evolution of gravitating masses and the astrodynamics of artificial satellites and interplanetary probes. Following detailed reviews of earlier editions by distinguished lecturers in the USA and Europe, the author has carefully revised and updated this edition. Each chapter provides a thorough introduction to prepare you for more complex concepts, reflecting a consistent perspective and cohesive organization that is used throughout the book. A noted expert in the field, the author not only discusses fundamental concepts, but also offers analyses of more complex topics, such as modern galactic studies and dynamical parallaxes. New to the Fourth Edition: * Numerous updates and reorganization of all chapters to encompass new methods * New results from recent work in areas such as satellite dynamics * New chapter on the Caledonian symmetrical n-body problem Extending its coverage to meet a growing need for this subject in satellite and aerospace engineering, Orbital Motion, Fourth Edition remains a top reference for postgraduate and advanced undergraduate students, professionals such as engineers, and serious amateur astronomers.*

The Solar System is a complex and fascinating dynamical system. This is the first textbook to describe comprehensively the dynamical features of the Solar System and to provide students with all the mathematical tools and physical models they need to understand how it works. It is a benchmark publication in the field of planetary dynamics and destined to become a classic. Clearly written and well illustrated, Solar System Dynamics shows how a basic knowledge of the two- and three-body problems and perturbation theory can be combined to understand features as diverse as the tidal heating of Jupiter's moon Io, the origin of the Kirkwood gaps in the asteroid belt, and the radial structure of Saturn's rings. Problems at the end of each chapter and a free Internet Mathematica® software package are provided. Solar System Dynamics provides an authoritative textbook for courses on planetary dynamics and celestial mechanics. It also equips students with the mathematical tools to tackle broader courses on dynamics, dynamical systems, applications of chaos theory and non-linear dynamics.

A coherent introduction for researchers in astronomy, particle physics, and cosmology on the formation and evolution of galaxies.

Knowledge Discovery in Big Data from Astronomy and Earth Observation: Astrogeoinformatics bridges the gap between astronomy and geoscience in the context of applications, techniques and key principles of big data. Machine learning and parallel computing are increasingly becoming cross-disciplinary as the phenomena of Big Data is becoming common place. This book provides insight into the common workflows and data science tools used for big data in astronomy and geoscience. After establishing similarity in data gathering, pre-processing and handling, the data science aspects are illustrated in the context of both fields. Software, hardware and algorithms of big data are addressed. Finally, the book offers insight into the emerging science which combines data and expertise from both fields in studying the effect of cosmos on the earth and its inhabitants. Addresses both astronomy and geosciences in parallel, from a big data perspective Includes introductory information, key principles, applications and the latest techniques Well-supported by computing and information science-oriented chapters to introduce the necessary knowledge in these fields

A Multiwavelength Perspective

A Student's Guide to Geophysical Equations

Astronomy: A Physical Perspective

Lecture Tutorials for Introductory Astronomy

Classical Dynamics

Electromagnetic Surface Waves

Spectroscopy enables the precise study of astronomical objects and phenomena. Bridging the gap between physics and astronomy, this is the first integrated graduate-level textbook on atomic astrophysics. It covers the basics of atomic physics and astrophysics, including state-of-the-art research applications, methods and tools. The content is evenly balanced between the physical foundations of spectroscopy and their applications to astronomical objects and cosmology. An undergraduate knowledge of physics is assumed, and relevant basic material is summarised at the beginning of each chapter. The material is completely self-contained and features sufficient background information for self-study. Advanced users will find it handy for spectroscopic studies. A website hosted by the authors contains updates, corrections, exercises and solutions, as well as news items from physics and astronomy related to spectroscopy. A link to this can be found at www.cambridge.org/9780521825368.

This book is the first unified systemic description of dissipative phenomena, taking place in biology, and non-dissipative (conservative) phenomena, which is more relevant to physics. Fully updated and revised, this new edition extends our understanding of nonlinear phenomena in biology and physics from the extreme / optimal perspective. The first book to provide understanding of physical phenomena from a biological perspective and biological phenomena from a physical perspective Discusses emerging fields and analysis Provides examples Cecilia Payne-Gaposchkin was the revolutionary scientific thinker who discovered what stars are made of. But her name is hard to find alongside those of Hubble, Herschel, and other great astronomers. Donovan Moore tells the story of Payne's life of determination against all the obstacles a patriarchal society erected against her.

In preparing the report, Astronomy and Astrophysics in the New Millennium , the AASC made use of a series of panel reports that address various aspects of ground- and space-based astronomy and astrophysics. These reports provide in-depth technical detail. Astronomy and Astrophysics in the New Millennium: An Overview summarizes the science goals and recommended initiatives in a short, richly illustrated, non-technical booklet.

Cosmological Physics

Astronomy and Astrophysics in the New Millennium

Physics and Chemistry of the Solar System

The Life of Cecilia Payne-Gaposchkin

Galaxy Formation and Evolution

Measuring the Universe

A complete and in-depth review of exoplanet research, covering the discovery methods, physics and theoretical background.

Advances in the study of dynamical systems have revolutionized the way that classical mechanics is taught and understood. Classical Dynamics, first published in 1998, is a comprehensive textbook that provides a complete description of this fundamental branch of physics. The authors expect to find in a standard graduate course: Lagrangian and Hamiltonian dynamics, canonical transformations, the Hamilton-Jacobi equation, perturbation methods, and rigid bodies. They also deal with more advanced topics such as the relativistic Kepler problem, Liouville and Darboux chaotic scattering. A key feature of the book is the early introduction of geometric (differential manifold) ideas, as well as detailed treatment of topics in nonlinear dynamics (such as the KAM theorem) and continuum dynamics (including solitons). The book contains many worked exercises. It will be an ideal textbook for graduate students of physics, applied mathematics, theoretical chemistry, and engineering, as well as a useful reference for researchers in these fields. A solutions manual is available exclusively for instructors.

A substantial update of this award-winning and highly regarded cosmology textbook, for advanced undergraduates in physics and astronomy.

This invaluable book, now in its second edition, covers a wide range of topics appropriate for both undergraduate and postgraduate courses in astrophysics. The book conveys a deep and coherent understanding of the stellar phenomena, and basic astrophysics of stars, galaxies, and clusters of galaxies. Since the first appearance of the book in 1997, significant progress has been made in different branches of Astronomy and Astrophysics. The second edition takes into account the developments of the subject which have taken place in the last decade. It discusses in the Hertzsprung-Russel diagram (or H-R diagram). Other developments discussed pertain to standard solar model, solar neutrino puzzle, cosmic microwave background radiation, Drake equation, dwarf galaxies, ultra compact dwarf galaxies, compact groups and cluster of galaxies. The book motivates the students to go deeper into the topics. Suggested readings at the end of each chapter have been complemented.

A Modern Perspective

Unfolding Our Universe

A Question and Answer Guide to Astronomy

Astrogeoinformatics

The Disordered Cosmos

Astrophysics for Physicists

For decades, the surface-plasmon-polariton wave guided by the interface of simple isotropic materials dominated the scene. However, in recent times research on electromagnetic surface waves guided by planar interfaces has expanded into new and exciting areas. In the 1990's research focused on advancing knowledge of the newly discovered Dyakonov wave. More recently, much of the surface wave research is motivated by the proliferation of nanotechnology and the growing number of materials available with novel properties. This book leads the reader from the relatively simple surface-plasmon-polariton wave with isotropic materials to the latest research on various types of electromagnetic surface waves guided by the interfaces of complex materials enabled by recent developments in nanotechnology. This includes: Dyakonov waves guided by interfaces formed with columnar thin films, Dyakonov-Tamm waves guided by interfaces formed with sculptured thin films, and multiple modes of surface-plasmon-polariton waves guided by the interface of a metal and a periodically varying dielectric material. Gathers research from the past 5 years in a single comprehensive view of electromagnetic surface waves. Written by the foremost experts and researchers in the field. Layered presentation explains topics with an introductory overview level up to a highly technical level.

Physics and Chemistry of the Solar System, 2nd Edition, is a comprehensive survey of the planetary physics and physical chemistry of our own solar system. It covers current research in these areas and the planetary sciences that have benefited from both earth-based and spacecraft-based experimentation. These experiments form the basis of this encyclopedic reference, which skillfully fuses synthesis and explanation. Detailed chapters review each of the major planetary bodies as well as asteroids, comets, and other small orbitals. Astronomers, physicists, and planetary scientists can use this state-of-the-art book for both research and teaching. This Second Edition features extensive new material, including expanded treatment of new meteorite classes, spacecraft findings from Mars Pathfinder through Mars Odyssey 2001, recent reflections on brown dwarfs, and descriptions of planned NASA, ESA, and Japanese planetary missions. * New edition features expanded treatment of new meteorite classes, the latest spacecraft findings from Mars, information about 100+ new discoveries of planets and stars, planned lunar and planetary missions, more end-of-chapter exercises, and more * Includes extensive new material and is amply illustrated throughout * Reviews each major planetary body, asteroids, comets, and other small orbitals

This fully revised and updated text is a comprehensive introduction to astronomical objects and phenomena. By applying some basic physical principles to a variety of situations, students will learn how to relate everyday physics to the astronomical world. Starting with the simplest objects, the text contains explanations of how and why astronomical phenomena occur, and how astronomers collect and interpret information about stars, galaxies and the solar system. The text looks at the properties of stars, star formation and evolution; neutron stars and black holes; the nature of galaxies; and the structure of the universe. It examines the past, present and future states of the universe; and final chapters use the concepts that have been developed to study the solar system, its formation; the possibility of finding other planetary systems; and the search for extraterrestrial life. This comprehensive text contains useful equations, chapter summaries, worked examples and end-of-chapter problem sets.

The emergence, existence and development of the surrounding world, both on Earth and throughout the universe, are due to the gravitational interactions of many bodies. This book is devoted to the calculation of bodies movements in various cases of interaction that are relevant now and in the future. They are developed for the free access of the Galactica system, which is designed to provide the numerical solution for problems of the gravitational interaction of N-bodies. It tackles a whole range of problems: The optimal motion of the spacecraft, the evolution of the solar system for 100 million years, the influence of the Sun on Mercurys perihelion, the motion of near-Earth asteroids, the evolution of Earth's rotation axis, etc. As a result of solving a number of problems, new knowledge about our world was obtained. The optimal trajectory of the spacecraft approaching the Sun is determined by numerical integration of the equations of motion for spacecraft, planets, the Sun, and the Moon. Exact solutions to the problem of the Newtonian gravitational interaction of N material points moving around N2 concentric circular orbits are reviewed. Each circular orbit contains N3 located bodies and the body system rotates as an entity. Solutions in various forms were obtained. A computer program has been developed. Structures comprising up to one million bodies have been calculated. The Galactica system is used for computing movements of two asteroids: Apophis and 1950DA. The evolution of their movement over a span of 1,000 years is investigated. The moments of their closest passages near the Earth are defined. The different ways of asteroid trajectory transformations into orbits of the Earths satellites are considered. This book proves that the rate of Mercurys perihelion rotation and relatively motionless space coincides with the Newtonian interaction of the planets and the oblate Sun. The issues connected with the Astronomical Theory of Ice Ages from the perspective of celestial mechanics are examined. Differential equations of rotational motion are solved with the help of the numerical method without simplification. The evolution of the Earth's axis was examined, and the periods of its oscillations that coincide with the observed ones were obtained. The calculations for a hundred thousand years demonstrate significant oscillation of the Earths axis. The oscillations of the Earths axis result in such oscillations of insolation that explain the paleoclimate changes. The exact solution to the problem, in which the bodies are uniformly distributed over a sphere, were obtained; they move experiencing no mutual collisions. The problem solution allows the formation of several planets for instance, one hundred planets resembling the Earth and moving under identical conditions with respect to the Sun. The latter possibility opens a way toward unrestricted progress for mankind. The book describes all the theoretical, practical issues and the Galactica system manual so that even a novice researcher could use it in his/her works.

The Exoplanet Handbook

Panel Reports

Early Physics and Astronomy

The Common Extremalities in Biology and Physics

This beginner's guide to the science of astronomy also explores the current work of professionals in the field. 120 color plates. 108 line diagrams.

Influenced by astronomy education research, 21st Century Astronomy offers a complete pedagogical and media package that facilitates learning by doing, while the new one-column design makes the Fifth Edition the most accessible introductory text available today.