

Alan Stern, Jacqueline Mitton

Pluto and Charon

Ice Worlds on the Ragged Edge of the
Solar System. Second Edition. Completely
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Pluto And Charon Ice Worlds On The Ragged Edge Of The Solar System

Alan Stern, Jacqueline Mitton



Pluto And Charon Ice Worlds On The Ragged Edge Of The Solar System:

Pluto and Charon Alan Stern, Jacqueline Mitton, 1998 Rave reviews for Pluto and Charon Ice Worlds on the Ragged Edge of the Solar System The story of the quest to understand Pluto and the resulting transformation of our concept of the diminutive planet from that of solar system misfit to king of the Kuiper Belt is told in this book by Alan Stern and Jacqueline Mitton Stern a Plutophile to the core is one of the most energetic talented and savvy planetary astronomers in the business today Mitton trained as an astronomer is an experienced writer and editor of scientific books for nonscientists Together they have created an immensely informative book Written in an engaging and informal style Pluto and Charon takes the reader step by step from the discovery of the ninth planet in 1930 to the current understanding of Pluto and its moon Charon Sky Telescope More than a book summarizing what we know about the planet Pluto and Charon is about how far and how fast astronomical technology has come since 1965 Stern and Mitton use the narrative of Pluto research to explain in comfortable everyday language how such work is done One of the nice touches in the book is that Stern and Mitton tell us something about each astronomer Astronomy Pluto and Charon presents the exploration of the ninth planet written as a vivid historical account for anyone with an interest in science and astronomy the authors describe in simple language the methods researchers use to explore the universe and the way ever improving instrumentation helps their knowledge advance Physics Today **Pluto and Charon** S. Alan Stern, David J. Tholen, 2017-01-15 For almost five decades after its discovery in 1930

the planet Pluto remained an enigma However several events have helped to lift the veil of mystery surrounding the ninth planet The discovery of its satellite Charon in 1978 permitted occultation observations that allowed scientists to determine the size of both bodies Astronomers also detected the presence of an atmosphere and the Hubble Space Telescope provided views in unprecedented detail In addition to these two fortuitous events advances in telescopic instrumentation and computational methods led to exciting observational and theoretical discoveries This Space Science Series volume focuses on the scientific issues associated with Pluto and Charon Fifty collaborating authors here review the latest research on the Pluto Charon binary from bulk properties surfaces and interiors to atmospheric structure composition and dynamics They also provide historical perspectives on Pluto Charon research and discuss the population of the trans Neptunian region and the origin of the Pluto Charon binary Also included are prefatory remarks by Pluto's and Charon's discoverers Clyde Tombaugh and James Christy Pluto and Charon offers the most comprehensive available compendium of research work for understanding these far off members of our solar system at a time following dramatic developments in our knowledge but before that knowledge can be advanced by spacecraft missions Originally published in 1997 now available as an e book

Asteroids and Dwarf Planets and How to Observe Them Roger Dymock, 2010-11-01 Dwarf planets which were formerly called asteroids except for the planet Pluto and the smaller Solar System bodies still called asteroids today are making front page news particularly those that are newly discovered and those that might present a hazard to life on Earth

by impacting our planet In this age of giant telescopes and space probes these small Solar System bodies have advanced from being tiny points of light to bodies worthy of widespread study This book describes the dwarf planets and asteroids themselves their origins orbits and composition and at how amateur astronomers can play a part in their detection tracking and imaging The book is divided into two parts Part I describes physical properties including taxonomic types of dwarf planets and asteroids how they formed in the early life of the Solar System and how they evolved to their present positions groups and families It also covers the properties used to define these small Solar System bodies magnitude rotation rates described by their light curves and orbital characteristics Part II opens with a description of the hardware and software an amateur or practical astronomer needs to observe and also to image asteroids Then numerous observing techniques are covered in depth Finally there are lists of relevant amateur and professional organizations and how to submit your own observations to them

The Solar System Beyond Neptune M. Antonietta Barucci, 2008 A new frontier in our solar system opened with the discovery of the Kuiper Belt and the extensive population of icy bodies orbiting beyond Neptune Today the study of all of these bodies collectively referred to as trans Neptunian objects reveals them to be frozen time capsules from the earliest epochs of solar system formation This new volume in the Space Science Series with one hundred contributing authors offers the most detailed and up to date picture of our solar system s farthest frontier Our understanding of trans Neptunian objects is rapidly evolving and currently constitutes one of the most active research fields in planetary sciences The Solar System Beyond Neptune brings the reader to the forefront of our current understanding and points the way to further advancement in the field making it an indispensable resource for researchers and students in planetary science

The Pluto System After New Horizons S. Alan Stern, 2021-08-10 Once perceived as distant cold dark and seemingly unknowable Pluto had long been marked as the farthest and most unreachable frontier for solar system exploration After Voyager accomplished its final planetary reconnaissance at Neptune in 1989 Pluto and its cohort in the Kuiper Belt beckoned as the missing puzzle piece for completing the first reconnaissance of our solar system In the decades following Voyager a mission to the Pluto system was not only imagined but also achieved culminating with the historic 2015 flyby by the New Horizons spacecraft Pluto and its satellite system the Pluto system including its largest moon Charon have been revealed to be worlds of enormous complexity that fantastically exceed preconceptions The Pluto System After New Horizons seeks to become the benchmark for synthesizing our understanding of the Pluto system The volume s lead editor is S Alan Stern who also serves as NASA s New Horizons Principal Investigator co editors Richard P Binzel William M Grundy Jeffrey M Moore and Leslie A Young are all co investigators on New Horizons Leading researchers from around the globe have spent the last five years assimilating Pluto system flyby data returned from New Horizons The chapters in this volume form an enduring foundation for ongoing study and understanding of the Pluto system The volume also advances insights into the nature of dwarf planets and Kuiper Belt objects providing a cornerstone for planning new missions that may return to the Pluto system

and explore others of the myriad important worlds beyond Neptune Ultraviolet Radiation in the Solar System M. Vázquez, A. Hanslmeier, 2006-06-30 In the history of science the opening up of a new observational or experimental window is always followed by an increase in knowledge of the subject concerned This is also the case with the subject of this book ultraviolet radiation hereafter UV In principle the ultraviolet range might be just one more of these windows of no particular importance However the energy per UV photon provides the main peculiarity its magnitude being great enough to produce important chemical reactions in the atmospheres of planets and satellites thereby affecting the transmission of this radiation to the ground The Sun is the main natural source of UV radiation in the Solar System and our planet is the body where its influences can be best tested and the only one where its relation with life can be studied However the terrestrial atmosphere blocks most of the photons in this electromagnetic range and astronomers have had to develop various techniques balloons planes and rockets to cross this barrier and access the information These tools have been used in parallel to investigate the physical properties of the terrestrial atmosphere and the interaction of its constituents with light This book will address most of these topics *Classifying the Cosmos* Steven J. Dick, 2019-03-21 Since the invention of the telescope 400 years ago astronomers have rapidly discovered countless celestial objects But how does one make sense of it all Astronomer and former NASA Chief Historian Steven J Dick brings order to this menagerie by defining 82 classes of astronomical objects which he places in a beginner friendly system known as Astronomy's Three Kingdoms Rather than concentrating on technicalities this system focuses on the history of each object the nature of its discovery and our current knowledge about it The ensuing book can therefore be read on at least two levels On one level it is an illustrated guide to various types of astronomical wonders On another level it is considerably more the first comprehensive classification system to cover all celestial objects in a consistent manner Accompanying each spread are spectacular historical and modern images The result is a pedagogical tour de force whereby readers can easily master astronomy's three realms of planets stars and galaxies The Pluto Files: The Rise and Fall of America's Favorite Planet Neil deGrasse Tyson, 2010-07-12 The New York Times bestseller You gotta read this It is the most exciting book about Pluto you will ever read in your life Jon Stewart When the Rose Center for Earth and Space at the American Museum of Natural History reclassified Pluto as an icy comet the New York Times proclaimed on page one Pluto Not a Planet Only in New York Immediately the public professionals and press were choosing sides over Pluto's planethood Pluto is entrenched in our cultural and emotional view of the cosmos and Neil deGrasse Tyson award winning author and director of the Rose Center is on a quest to discover why He stood at the heart of the controversy over Pluto's demotion and consequently Plutophiles have freely shared their opinions with him including endless hate mail from third graders With his inimitable wit Tyson delivers a mini history of planets describes the oversized characters of the people who study them and recounts how America's favorite planet was ousted from the cosmic hub **Remote and Robotic Investigations of the Solar System** C.R. Kitchin, 2017-09-18 Interest in and knowledge of the techniques utilised to investigate our solar system

has been growing rapidly for decades and has now reached a stage of maturity Therefore the time has now arrived for a book that provides a cohesive and coherent account of how we have obtained our present knowledge of solar system objects not including the Sun Remote and Robotic Investigations of the Solar System covers all aspects of solar system observations the instruments their theory and their practical use both on Earth and in space It explores the state of the art telescopes cameras spacecraft and instruments used to analyse the interiors surfaces atmospheres and radiation belts of solar system objects in addition to radio waves gamma rays cosmic rays and neutrinos This book would be ideal for university students undertaking physical science subjects and professionals working in the field in addition to amateur astronomers and anyone interested in learning more about our local astronomical neighbours

The Hunt for Planet X Govert Schilling, 2010-01-24 Ever since the serendipitous discovery of planet Uranus in 1871 astronomers have been hunting for new worlds in the outer regions of our solar system This exciting and ongoing quest culminated recently in the discovery of hundreds of ice dwarfs in the Kuiper belt robbed Pluto from its planet status and led to a better understanding of the origin of the solar system This timely book reads like a scientific who done it going from the heights of discovery to the depths of disappointment in the hunt for Planet X Based on many personal interviews with astronomers the well known science writer Govert Schilling introduces the heroes in the race to be the first in finding another world bigger than Pluto

Pluto and Charon Alan Stern, Jacqueline Mitton, 2005-10-28 The exploration of the ninth planet Pluto its moon Charon and their relationship to the newly discovered Kuiper Belt is a tale of perseverance ingenuity and dedication on the part of the planetary scientists who have been lured by the fascination of these far flung miniature worlds In *Pluto and Charon* Alan Stern and Jacqueline Mitton turn that story into an entertaining adventure starting with the discovery of Pluto by Clyde Tombaugh in 1930 In a highly accessible narrative they bring to life the many Plutophiles who with skill and resourcefulness have pieced together over several decades an amazingly detailed picture of the nature of Pluto and Charon The book also documents vividly the struggle by Plutophiles and the public to persuade NASA to fund a mission to Pluto the only planet not yet explored from close proximity by a spacecraft Hopes were alternately raised and dashed before eventual victory At last New Horizons led by author Stern as Principal Investigator is due to be launched in early 2006 on a 9 year journey to Pluto Charon and beyond For this second edition Stern and Mitton have brought their 1998 book fully up to date including the latest discoveries about Pluto s ancient relationship with the members of the Kuiper Belt of icy bodies and dwarf planets beyond Neptune They have also added a completely new chapter on the New Horizons mission

Pluto Confidential Stephen P. Maran, Laurence A. Marschall, 2009-08-04 When the International Astronomical Union IAU adopted a new definition of a planet in August 2006 Pluto became a dwarf planet drawing a divisive line in science and public opinions The controversy of whether Pluto is a planet continues years later and passion about the decision remains pitting scientist against scientist and invoking sentiments and nostalgia from the rest of the world With the IAU definition the future of space objects is forever changed Learn how this resolution came to be and

what it means for astronomy who implemented it and who is against it and whether it is the first or millionth time the world's view of astronomy has rotated on its axis Written by an astronomer and educator who voted for the IAU resolution Laurence A Marschall and a NASA scientist who supported the opposing petition that resulted Stephen P Maran Pluto Confidential leaves no perspective out and no asteroid unturned in the Pluto debate A telescopic look inside the book History of planetary disputes including why Jupiter almost wasn't acknowledged What Bode's Law is and how it has influenced observations Who discovered Pluto and how it was named The Kuiper Belt and its role in what it means to be a planet Beyond Pluto and the eight distinguished planets New Horizons C.T. Russell,2009-02-28 New Horizons Reconnaissance of the Pluto Charon System and the Kuiper Belt C T Russell Originally published in the journal Space Science Reviews Volume 140 Nos 1 4 1 2 DOI 10 1007 s11214 008 9450 0 Springer Science Business Media B V 2008 Exploration is mankind's imperative Since the beginnings of civilization men and women have not been content to build a wall around their settlements and stay within its confines They explored the land around them climbed the mountains and scanned the horizons The boldest among them pushed exploration to the most distant frontiers of the planet As a result much of the Earth was inhabited well before the days of the renowned European explorers of the 15 and 16 centuries Exploration did not cease after the circumnavigation of the globe it continued to the present Today explorers are going in new directions not just east and west north and south They explore backward in time and upward in space Arcology explores the shorter time scales and geochemistry the longer time scales of geological events asteroidal and cometary collisions magnetic reversals continental formation and more However on Earth we cannot go back indefinitely for much of the evidence of the very earliest days has been lost

Discovery and Classification in Astronomy Steven J. Dick,2013-09-09 This book shows that astronomical discovery is a complex and ongoing process comprising various stages of research interpretation and understanding Planetary Crusts S. Ross Taylor,Scott McLennan,2009 Planetary Crusts explains how and why solid planets and satellites develop crusts Extensively referenced and annotated it presents a geochemical and geological survey of the crusts of the Moon Mercury Venus Earth and Mars the asteroid Vesta and several satellites like Io Europa Ganymede Titan and Callisto After describing the nature and formation of solar system bodies the book presents a comparative investigation of different planetary crusts and discusses many crustal controversies The authors propose the theory of stochastic processes dominating crustal development and debate the possibility of Earth-like planets existing elsewhere in the cosmos Written by two leading authorities on the subject this book presents an extensive survey of the scientific problems of crustal development and is a key reference for researchers and students in geology geochemistry planetary science astrobiology and astronomy **The Outer Solar System** Erik Gregersen Associate Editor, Astronomy and Space Exploration,2009-12-20 Presents an introduction to the solar system focusing on the Sun and the four planets furthest from it along with information about Pluto the Kuiper Belt asteroids meteors and comets **The Universe as It Really Is** Thomas R. Scott,2018-06-26 The universe

that science reveals to us can seem far outside the comfort zone of the human mind. Subjects near and far open up dizzying vistas from the infinitesimal to the colossal. Humanity, the unlikely product of uncountable coincidences on unimaginable scales, inhabits a tumultuous universe that extends from our immediate environs to the most distant galaxies and beyond. But when the mind balks at the vertiginous complexity of the universe, science unveils the elegance amid the chaos. In this book, Thomas R. Scott ventures into the known and the unknown to explain our universe and the laws that govern it. *The Universe as It Really Is* begins with physics and the building blocks of the universe: time, gravity, light, and elementary particles, and chemistry's ability to explain the interactions among them. Scott, with the assistance of James Lawrence Powell, next tours the earth and atmospheric sciences to explain the forces that shape our planet and then takes off for the stars to describe our place in the cosmos. He provides vivid introductions to our collective scientific inheritance, narrating discoveries such as the shape of the atom and the nature of the nucleus or how we use GPS to measure time and what that has to do with relativity. A clear demonstration of the power of scientific reasoning to bring the incomprehensible within our grasp, *The Universe as It Really Is* gives an engrossing account of just how much we do understand about the world around us. [Air Force Magazine](#), 2000-07

[Frontiers of Astrobiology](#) Chris Impey, Jonathan Lunine, José Funes, 2012-11-15 Astrobiology is an exciting interdisciplinary field that seeks to answer one of the most important and profound questions: are we alone? In this volume, leading international experts explore the frontiers of astrobiology, investigating the latest research questions that will fascinate a wide interdisciplinary audience at all levels. What is the earliest evidence for life on Earth? Where are the most likely sites for life in the Solar System? Could life have evolved elsewhere in the Galaxy? What are the best strategies for detecting intelligent extraterrestrial life? How many habitable or Earth-like exoplanets are there? Progress in astrobiology over the past decade has been rapid, and with evidence accumulating that Mars once hosted standing bodies of liquid water, the discovery of over 500 exoplanets, and new insights into how life began on Earth, the scientific search for our origins and place in the cosmos continues.

The Case for Pluto Alan Boyle, 2009-10-22 In support of Pluto, the cutest and most unfairly treated planet. Pity poor Pluto! It's a planet that was discovered because of a mistake, a planet that turned out not to be a planet at all, thanks to a still-disputed decision made in 2006. And yet Pluto is the planet best loved by Americans, especially children, one that may have contained the building blocks of life billions of years ago and may well serve as life's last redoubt billions of years from now. In *The Case for Pluto*, award-winning science writer Alan Boyle traces the tiny planet's ups and downs, its strange appeal, the reasons behind its demotion, and the reasons why it should be set back in the planetary pantheon. Tells the compelling story of Pluto's discovery and how it became a cultural icon. Makes the case for Pluto as planet, countering the books that argue against it. Comes in a small, friendly package, just like Pluto, and features a handsome design, making it a great gift. *The Case for Pluto* is the must-read tale of a cosmic underdog that has captured the hearts of millions: an endearing little planet that is changing the way we see the universe beyond our backyard. Alan Boyle is MSNBC.com's

science editor and the award winning blogger behind Cosmic Log He's been a talking head on NBC's The Today Show and the MSNBC cable channel holding forth on scientific subjects ranging from the chances of an asteroid Armageddon to the 3D wizardry behind the Harry Potter movies But he writes better than he talks

Decoding **Pluto And Charon Ice Worlds On The Ragged Edge Of The Solar System**: Revealing the Captivating Potential of Verbal Expression

In a period characterized by interconnectedness and an insatiable thirst for knowledge, the captivating potential of verbal expression has emerged as a formidable force. Its power to evoke sentiments, stimulate introspection, and incite profound transformations is genuinely awe-inspiring. Within the pages of "**Pluto And Charon Ice Worlds On The Ragged Edge Of The Solar System**," a mesmerizing literary creation penned by way of a celebrated wordsmith, readers embark on an enlightening odyssey, unraveling the intricate significance of language and its enduring affect our lives. In this appraisal, we shall explore the book is central themes, evaluate its distinctive writing style, and gauge its pervasive influence on the hearts and minds of its readership.

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