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# Mapping Mars Science Imagination And The Birth Of

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Geographies of Mars  
 Exploring Planetary Climate  
 Off the Main Sequence  
 Mapping Mars: Science, Imagination and the Birth of a World (Text Only)  
 Planetary Remote Sensing and Mapping  
 The Rock From Mars  
 The Moon  
 On the Map  
 Rethinking the Power of Maps  
 Dying Planet  
 The Case For Mars  
 Mapping Information Landscapes  
 The Transgressive Iain Banks  
 Mission Mars  
 The Smithsonian History of Space Exploration  
 Cosmic Biology  
 The World of Maps  
 Alien Intelligence and the Pathway to Mars  
 Twenty-First Century Science Fiction  
 The Planet Remade  
 Exploration and Engineering  
 Stitching the World: Embroidered Maps and Women's Geographical Education  
 Exploration and Science  
 Visual Cultures in Science and Technology  
 The Perversity of Things  
 Imagining Outer Space  
 Planetary Cartography and GIS  
 The Atlas of Mars  
 Visions of Mars  
 Mapping Mars  
 Real-World Python  
 The Sirens of Mars  
 Women in American Cartography  
 Gaither's Dictionary of Scientific Quotations  
 Tackling Tomorrow Today  
 The Search for Life on Mars  
 Exploring the Solar System  
 21st Century Science Fiction  
 Imagining Mars  
 Handbook of Public Communication of Science and Technology

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## KENDRICK PAOLA

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*Geographies of Mars* Bloomsbury  
 Publishing USA

The first in-depth, fully illustrated history of global space discovery and exploration from ancient times to the modern era "The Smithsonian History of Space Exploration examines civilization's continued desire to explore the next frontier as only the Smithsonian can do it." —Buzz Aldrin, Gemini 12 and Apollo 11 astronaut and author of *No Dream Is Too High* Former NASA and Smithsonian space curator and historian Roger D. Launius presents a comprehensive history of our endeavors to understand the universe, honoring millennia of human curiosity, ingenuity,

and achievement. This extensive study of international space exploration is packed with over 500 photographs, illustrations, graphics, and cutaways, plus plenty of sidebars on key scientific and technological developments, influential figures, and pioneering spacecraft. Starting with space exploration's origins in the pioneering work undertaken by ancient civilizations and the great discoveries of the Renaissance thinkers, Launius also devotes whole chapters to our space race to the Moon, space planes and orbital stations, and the lure of the red planet Mars. He also offers new insights into well-known moments such as the launch of Sputnik 1 and the Apollo Moon landing and explores the unexpected events and hidden figures of space history. The final chapters cover the technological and mechanical

breakthroughs enabling humans to explore far beyond our own planet in recent decades, speculating on the future of space exploration, including space tourism and our possible future as an extraterrestrial species. This is a must-read for space buffs and everyone intrigued by the history and future of scientific discovery. "This oversize offering is a space nerd's dream come true."  
 —Booklist

**Exploring Planetary Climate** Springer  
 A contemporary follow-up to the groundbreaking *Power of Maps*, this book takes a fresh look at what maps do, whose interests they serve, and how they can be used in surprising, creative, and radical ways. Denis Wood describes how cartography facilitated the rise of the modern state and how maps continue to embody and project the interests of their

creators. He demystifies the hidden assumptions of mapmaking and explores the promises and limitations of diverse counter-mapping practices today. Thought-provoking illustrations include U.S. Geological Survey maps; electoral and transportation maps; and numerous examples of critical cartography, participatory GIS, and map art.

**Off the Main Sequence** Guilford Press Mapping Information Landscapes presents the first in-depth study of the educational implications of the idea of information literacy as 'the capacity to map and navigate an information landscape'. Written by a leading researcher in the field, it investigates how teachers and learners can use mapping in developing their ability to make informed judgements about information, in specific places and times. Central to the argument is the notion that the geographical and information landscapes are indivisible, and the techniques we use to navigate each are essentially the same. The book presents a history of mapping as a means of representing the world, ranging from the work of medieval mapmakers to the 21st century. Concept and mind mapping are explored, and finally, the notion of discursive mapping: the dialogic process, regardless of whether a graphical map is an outcome. The theoretical framework of the book weaves together the work of authors including Annemaree Lloyd, Christine Bruce, practice theorists such as Theodore Schatzki and the critical geography of David Harvey, an author whose work has not previously been applied to the study of information literacy. The book concludes that keeping information landscapes sustainable and navigable requires attention to how equipment is used to map and organise those landscapes. How we collectively think about and solve problems in the present time inscribes maps and positions them as resources in whatever landscapes we will draw on in the future. Information literacy educators, whether in libraries, other HE courses, high schools or the workplace, will benefit by learning about how mapping – implicitly and explicitly – can be used as a method of teaching IL. The book will also be useful reading for academics and researchers of information literacy and students of library and information science.

**Mapping Mars: Science, Imagination and the Birth of a World (Text Only)** Routledge

With a focus of the Perseverance rover mission, here is the "Quintessential account of one of humanity's most intriguing quests" (Pail Halpern, Medium),

"A remarkable, timely, and up-to-date account of Mars exploration" (Leonard David, "Space Insider," Space.com). From The War of the Worlds to The Martian and to the amazing photographs sent back by the robotic rovers Curiosity and Opportunity, Mars has excited our imaginations as the most likely other habitat for life in the solar system. Now the Red Planet is coming under scrutiny as never before. As new missions are scheduled to launch this year from the United States and China, and with the European Space Agency's ExoMars mission now scheduled for 2022, this book recounts in full the greatest scientific detective story ever. For the first time in forty years, the missions heading to Mars will look for signs of ancient life on the world next door. It is the latest chapter in an age-old quest that encompasses myth, false starts, red herrings, and bizarre coincidences—as well as triumphs and heartbreaking failures. This book, by two journalists with deep experience covering space exploration, is the definitive story of how life's discovery has eluded us to date, and how it will be found somewhere and sometime this century. The Search for Life on Mars is based on more than a hundred interviews with experts at NASA's Jet Propulsion Laboratory and elsewhere, who share their insights and stories. While it looks back to the early Mars missions such as Viking 1 and 2, the book's focus is on the experiments and revelations from the most recent ones—including Curiosity, which continues to explore potentially habitable sites where water was once present, and the Mars Insight lander, which has recorded more than 450 marsquakes since its deployment in late 2018—as well as on the Perseverance and ExoMars rover missions ahead. And the book looks forward to the newest, most exciting frontier of all: the day, not too far away, when humans will land, make the Red Planet their home, and look for life directly.

**Planetary Remote Sensing and Mapping** Springer Science & Business Media Although the Jet Propulsion Laboratory in Pasadena, California, has become synonymous with the United States' planetary exploration during the past half century, its most recent focus has been on Mars. Beginning in the 1990s and continuing through the Mars Phoenix mission of 2007, JPL led the way in engineering an impressive, rapidly evolving succession of Mars orbiters and landers, including roving robotic vehicles whose successful deployment onto the Martian surface posed some of the most complicated technical problems in space

flight history. In Exploration and Engineering, Erik M. Conway reveals how JPL engineers' creative technological feats led to major breakthroughs in Mars exploration. He takes readers into the heart of the lab's problem-solving approach and management structure, where talented scientists grappled with technical challenges while also coping, not always successfully, with funding shortfalls, unrealistic schedules, and managerial turmoil. Conway, JPL's historian, offers an insider's perspective into the changing goals of Mars exploration, the ways in which sophisticated computer simulations drove the design process, and the remarkable evolution of landing technologies over a thirty-year period. "A masterpiece of research and writing."—Quest: History of Spaceflight Quarterly "A 'must' for any reader of modern astronomy who wants insights into how the lab conducts its research, solves problems, and handle[s] technological challenges."—Midwest Book Review "A great tale of ambition, mishap and recovery, building on extensive archival research and interviews with JPL managers, scientists and engineers, to deliver a detailed overview of each mission's feats and failures . . . Exploration and Engineering is a great book for everyone seriously interested in the struggles and achievements of JPL as NASA's centre for Mars exploration."—Sky at Night Erik M. Conway is a historian of science and technology at the Jet Propulsion Laboratory, California Institute of Technology. He is the author of *Atmospheric Science at NASA: A History. The Rock From Mars* Wesleyan University Press

A project-based approach to learning Python programming for beginners. Intriguing projects teach you how to tackle challenging problems with code. You've mastered the basics. Now you're ready to explore some of Python's more powerful tools. Real-World Python will show you how. Through a series of hands-on projects, you'll investigate and solve real-world problems using sophisticated computer vision, machine learning, data analysis, and language processing tools. You'll be introduced to important modules like OpenCV, NumPy, Pandas, NLTK, Bokeh, Beautiful Soup, Requests, HoloViews, Tkinter, turtle, matplotlib, and more. You'll create complete, working programs and think through intriguing projects that show you how to: Save shipwrecked sailors with an algorithm designed to prove the existence of God Detect asteroids and comets moving against a starfield Program a sentry gun to

shoot your enemies and spare your friends  
 Select landing sites for a Mars probe using  
 real NASA maps  
 Send unbreakable messages based on a book code  
 Survive a zombie outbreak using data science  
 Discover exoplanets and alien megastructures orbiting distant stars  
 Test the hypothesis that we're all living in a computer simulation  
 And more! If you're tired of learning the bare essentials of Python Programming with isolated snippets of code, you'll relish the relevant and geeky fun of Real-World Python!

### **The Moon** Facet Publishing

Who are the extraordinary individuals that will take us on the next great space race, the next great human endeavor, our exploration and colonization of the planet Mars? And more importantly, how are they doing it? Acclaimed science writer Oliver Morton explores the peculiar and fascinating world of the new generation of explorers: geologists, scientists, astrophysicists and dreamers. Morton shows us the complex and beguiling role that mapping will play in our understanding of the red planet, and more deeply, what it means for humans to envision such heroic landscapes. Charting a path from the 19th century visionaries to the spy-satellite pioneers to the science fiction writers and the arctic explorers -- till now, to the people are taking us there - - Morton unveils the central place that Mars has occupied in the human imagination, and what it will mean to realize these dreams. A pioneering work of journalism and drama, Mapping Mars gives us our first exciting glimpses of the world to come and the curious, bizarre, and amazing people who will take us there.

### *On the Map* Routledge

Cartography enthusiasts rejoice: the bestselling author of *Just My Type* reveals the fascinating relationship between man and map. Simon Garfield's *Just My Type* illuminated the world of fonts and made everyone take a stand on Comic Sans and care about kerning. Now Garfield takes on a subject even dearer to our fanatical human hearts: maps. Imagine a world without maps. How would we travel? Could we own land? What would men and women argue about in cars? Scientists have even suggested that mapping—not language—is what elevated our prehistoric ancestors from ape-dom. Follow the history of maps from the early explorers' *Mappa Mundi* to Google Maps and the satellite renderings on our smartphones, Garfield explores the unique way that maps relate and realign our history—and reflect the best and worst of what makes us human. Featuring a foreword by Dava

Sobel and packed with fascinating tales of cartographic intrigue, outsize personalities, and amusing “pocket maps” on an array of subjects from how to fold a map to the strangest maps on the Internet, *On the Map* is a rich historical tapestry infused with Garfield's signature narrative flair. Map-obsessives and everyone who loved *Just My Type* will be lining up to join Garfield on his audacious journey through time and around the globe.

### *Rethinking the Power of Maps* Simon and Schuster

In 1905, a young Jewish immigrant from Luxembourg founded an electrical supply shop in New York. This inventor, writer, and publisher Hugo Gernsback would later become famous for launching the first science fiction magazine, *Amazing Stories*, in 1926. But while science fiction's annual Hugo Awards were named in his honor, there has been surprisingly little understanding of how the genre began among a community of tinkerers all drawn to Gernsback's vision of comprehending the future of media through making. In *The Perversity of Things*, Grant Wythoff makes available texts by Hugo Gernsback that were foundational both for science fiction and the emergence of media studies. Wythoff argues that Gernsback developed a means of describing and assessing the cultural impact of emerging media long before media studies became an academic discipline. From editorials and blueprints to media histories, critical essays, and short fiction, Wythoff has collected a wide range of Gernsback's writings that have been out of print since their magazine debut in the early 1900s. These articles cover such topics as television; the regulation of wireless/radio; war and technology; speculative futures; media-archaeological curiosities like the dynamophone and hypnobioscope; and more. All together, this collection shows how Gernsback's publications evolved from an electrical parts catalog to a full-fledged literary genre. *The Perversity of Things* aims to reverse the widespread misunderstanding of Gernsback within the history of science fiction criticism. Through painstaking research and extensive annotations and commentary, Wythoff reintroduces us to Gernsback and the origins of science fiction.

### *Dying Planet* McFarland

This book approaches geological, geomorphological and topographical mapping from the point in the workflow at which science-ready datasets are available. Though there have been many individual projects on dynamic maps and online GISs, in which coding and data

processing are given precedence over cartographic principles, cartography is more than “just” processing and displaying spatial data. However, there are currently no textbooks on this rapidly changing field, and methods tend to be shared informally. Addressing this gap in the literature, the respective chapters outline many topics pertaining to cartography and mapping such as the role and definition of planetary cartography and (vs?) Geographic Information Science; theoretical background and practical methodologies in geological mapping; science-ready versus public-ready products; a goal/procedure-focused practical manual of the most commonly used software in planetary mapping, which includes generic (ArcGIS and its extensions, JMARS) and specific tools (HiView, Cratertools etc.); extracting topographic information from images; thematic mapping: climate; geophysics; surface modeling; change detection; landing site selection; shared maps; dynamic maps on the web; planetary GIS interfaces; crowdsourcing; crater counting techniques; irregular bodies; geological unit symbology; mapping center activities; and web services. All chapters were prepared by authors who have actually produced geological maps or GISs for NASA / the USGS, DLR, ESA or MIIGAİK. Taken together, they offer an excellent resource for all planetary scientists whose research depends on mapping, and for students of astrogeology.

### **The Case For Mars** Profile Books

The early 21st century marks a new era in space exploration. The National Aeronautics and Space Administration (NASA) of the United States, The European Space Agency (ESA), as well as space agencies of Japan, China, India, and other countries have sent their probes to the Moon, Mars, and other planets in the solar system. *Planetary Remote Sensing and Mapping* introduces original research and new developments in the areas of planetary remote sensing, photogrammetry, mapping, GIS, and planetary science resulting from the recent space exploration missions. Topics covered include: Reference systems of planetary bodies  
 Planetary exploration missions and sensors  
 Geometric information extraction from planetary remote sensing data  
 Feature information extraction from planetary remote sensing data  
 Planetary remote sensing data fusion  
 Planetary data management and presentation  
 Planetary Remote Sensing and Mapping will serve scientists and professionals working in the planetary remote sensing and mapping areas, as



well as planetary probe designers, engineers, and planetary geologists and geophysicists. It also provides useful reading material for university teachers and students in the broader areas of remote sensing, photogrammetry, cartography, GIS, and geodesy.

#### Mapping Information Landscapes

McFarland

A fantastic collection of recent stories from some of science fiction's greatest up-and-coming authors, including many award-winners. David Hartwell and Patrick Nielsen Hayden have long been recognised as some of the most skilled and trusted arbiters in science fiction, but *Twenty-First Century Science Fiction* presents fans with a first opportunity to see their considerable talents combined, and also to get a unique perspective on what's coming next in the genre. The anthology includes authors ranging from bestselling and established favourites to incandescent new talents, including Cory Doctorow, Catherynne M. Valente, John Scalzi, Jo Walton, Charles Stross, Elizabeth Bear and Peter Watts. The stories selected include winners and nominees of all of the science fiction genre's major awards. Stories include Bacigalupi's 'The Gambler' (Hugo, Nebula, Sturgeon and BSFA nominee), Bear's 'Tideline' (Hugo and Sturgeon winner), Cooper's 'Savant Songs' (Sturgeon nominee), Cornell's 'One of Our Bastards Is Missing' (Hugo nominee), Gregory's 'Second Person Present Tense' (Sturgeon nominee), Mary Robinette Kowal's 'Evil Robot Monkey' (Hugo nominee), David Levine's 'Tk'tk'tk' (Hugo winner), David Moles's 'Finisterra' (Hugo nominee, Sturgeon winner), Hannu Rajaniemi's 'His Master's Voice' (BSFA and Sturgeon winner), Rachel Swirsky's 'Eros', *Philia, Agape* (Hugo and Sturgeon nominee), Peter Watts's 'The Island' (Hugo winner, Sturgeon nominee).

#### **The Transgressive** **Iain Banks** Simon and Schuster

Seventeen wide-ranging essays explore the evolving scientific understanding of Mars, and the relationship between that understanding and the role of Mars in literature, the arts and popular culture. Essays in the first section examine different approaches to Mars by scientists and writers Jules Verne and J.H. Rosny. Section Two covers the uses of Mars in early Bolshevik literature, Wells, Brackett, Burroughs, Bradbury, Heinlein, Dick and Robinson, among others. The third section looks at Mars as a cultural mirror in science fiction. Essayists include prominent writers (e.g., Kim Stanley Robinson), scientists and literary critics from many nations.

*Mission Mars* Oxford University Press, USA  
An accessible and engaging account of the history of climate science and exploration on Earth and other planetary bodies.

#### *The Smithsonian History of Space Exploration* Simon and Schuster

Tom Easton has served as the monthly book review columnist for *Analog Science Fiction* for almost three decades, having contributed during that span many hundreds of columns and over a million words of penetrating criticism on the best literature that science fiction has to offer. His reviews have been celebrated for their wit, humor, readability, knowledge, and incisiveness. His love of literature, particularly fantastic literature, is everywhere evident in his essays. Easton has ever been willing to cover small presses, obscure authors, and unusual publications, being the only major critic in the field to do so on a regular basis. He seems to delight in finding the rare gem among the backwaters of the publishing field. "A reviewer's job," he says, "is not to judge books for the ages, but to tell readers enough about a book to give them some idea of whether they would enjoy it." And this he does admirably, whether he's discussing the works of the great writers in the field, or touching upon the least amongst them. This companion volume to "Periodic Stars" (Borgo/Wildside) collects another 250 of Easton's best reviews from the last fifteen years of "The Reference Library." No one does it better, and no other guide provides such lengthy or discerning commentary on the best SF works of recent times. Complete with Introduction and detailed Index.

#### *Cosmic Biology* Picador

Although women have been involved in mapping throughout history, their story has largely been hidden. The standard histories of cartography have focused on men. A woman's name is rarely found. In *Women in American Cartography*, Judith Tyner argues that women were not deliberately erased but overlooked because of the types of maps they made and the jobs they held. Tyner looks at over fifty women exemplars in American cartography and their maps. She looks at teachers who made school atlases in the early nineteenth century; at pictorial mapmakers and book illustrators who created popular maps; at women who pioneered social and persuasive mapping, promoting causes such as suffrage; at women travelers who recorded their trips and mapped unexplored places; at women whose maps helped win World War II; at women academics who studied, taught, and wrote about cartographic theory at colleges and universities; and at women

who worked in government agencies and commercial mapping companies. These are just a few of the stories of women in American cartography.

#### **The World of Maps** Penguin

A Sunday Times must read book of 2019 'An out-of-this-world read ... brilliant and compelling. Morton is a high-octane British science journalist, and every chapter is littered with material that strikes, amazes or haunts ... this is a book filled not just with a lifetime's knowledge of its subject but with a lifetime's suppressed excitement.' James McConnachie, Sunday Times  
Every generation has looked up from the Earth and wondered at the beauty of the Moon. 50 years ago, a few Americans became the first to do the reverse - with the whole world watching through their eyes. In this short but wide-ranging book, Oliver Morton explores the history and future of humankind's relationship with the Moon. A counterpoint in the sky, it has shaped our understanding of the Earth from Galileo to Apollo. Its gentle light has spoken of love and loneliness; its battered surface of death and the cosmic. For some, it is a future on which humankind has turned its back. For others, an adventure yet to begin. Advanced technologies, new ambitions and old dreams mean that men, women and robots now seem certain to return to the Moon. What will they learn there about the universe, the Earth and themselves? And, this time, will they stay?  
[Alien Intelligence and the Pathway to Mars](#)  
Cambridge University Press

As a new wave of interplanetary exploration unfolds, a talented young planetary scientist charts our centuries-old obsession with Mars. 'Beautifully written, emotive - a love letter to a planet'  
DERMOT O'LEARY, BBC Radio 2  
Mars - bewilderingly empty, coated in red dust - is an unlikely place to pin our hopes of finding life elsewhere. And yet, right now multiple spacecraft are circling, sweeping over Terra Sabaea, Syrtis Major, the dunes of Elysium and Mare Sirenum - on the brink, perhaps, of a discovery that would inspire humankind as much as any in our history. With poetic precision and grace, Sarah Stewart Johnson traces the evocative history of our explorations of Mars. She interlaces her personal journey as a scientist with tales of other seekers - from Galileo to William Herschel to Carl Sagan - who have scoured this enigmatic planet for signs of life and transformed it in our understanding from a distant point of light into a complex world. Ultimately, she shows how its story is also a story about Earth: it is a foil, a mirror, a tell-tale reflection of our own anxieties and

yearnings to find - if we're lucky - that we're not alone. 'Elegantly written and boundlessly entertaining' Sunday Telegraph 'Beguiling' The Times 'Johnson's prose swirls with lyrical wonder, as varied and multi-hued as the apricot deserts, butterscotch skies and blue sunsets of Mars' Anthony Doerr, New York Times Book Review 'Elegantly crafted' Lord Martin Rees, Astronomer Royal *Twenty-First Century Science Fiction* Guilford Publications

One of the first maps of Mars, published by an Italian astronomer in 1877, with its pattern of canals, fueled belief in intelligent life forms on the distant red planet—a hope that continued into the 1960s. Although the Martian canals have long since been dismissed as a famous error in the history of science, K. Maria D. Lane argues that there was nothing accidental about these early interpretations. Indeed, she argues, the construction of Mars as an incomprehensibly complex and engineered world both reflected and challenged dominant geopolitical themes during a time of major cultural, intellectual, political, and economic transition in the Western world. *Geographies of Mars* telescopes in on a critical period in the

development of the geographical imagination, when European imperialism was at its zenith and American expansionism had begun in earnest. Astronomers working in the new observatories of the American Southwest or in the remote heights of the South American Andes were inspired, Lane finds, by their own physical surroundings and used representations of the Earth's arid landscapes to establish credibility for their observations of Mars. With this simple shift to the geographer's point of view, Lane deftly explains some of the most perplexing stances on Mars taken by familiar protagonists such as Percival Lowell, Alfred Russel Wallace, and Lester Frank Ward. A highly original exploration of geography's spatial dimensions at the beginning of the twentieth century, *Geographies of Mars* offers a new view of the mapping of far-off worlds.

*The Planet Remade* Springer

For more than a century, Mars has been at the center of debates about humanity's place in the cosmos. Focusing on perceptions of the red planet in scientific works and science fiction, *Dying Planet* analyzes the ways Mars has served as a screen onto which humankind has projected both its hopes for the future and

its fears of ecological devastation on Earth. Robert Markley draws on planetary astronomy, the history and cultural study of science, science fiction, literary and cultural criticism, ecology, and astrobiology to offer a cross-disciplinary investigation of the cultural and scientific dynamics that have kept Mars on front pages since the 1800s. Markley interweaves chapters on science and science fiction, enabling him to illuminate each arena and to explore the ways their concerns overlap and influence one another. He tracks all the major scientific developments, from observations through primitive telescopes in the seventeenth century to data returned by the rovers that landed on Mars in 2004. Markley describes how major science fiction writers—H. G. Wells, Kim Stanley Robinson, Philip K. Dick, Edgar Rice Burroughs, Ray Bradbury, Robert Heinlein, and Judith Merril—responded to new theories and new controversies. He also considers representations of Mars in film, on the radio, and in the popular press. In its comprehensive study of both science and science fiction, *Dying Planet* reveals how changing conceptions of Mars have had crucial consequences for understanding ecology on Earth.