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## **NASA Tech Briefs**

The fascinating story of how NASA sent humans to explore outer space, told through a treasure trove of historical documents--publishing in celebration of

NASA's 60th anniversary and with a foreword by Bill Nye Among all the technological accomplishments of the last century, none has captured our imagination more deeply than the movement of humans into outer space. From Sputnik to SpaceX, the story of that journey is told as never before in *The Penguin Book of Outer Space Exploration*. Renowned space historian John Logsdon traces the greatest moments in human spaceflight by weaving together essential, fascinating documents from NASA's history with his expert narrative guidance. Beginning with rocket genius Wernher von Braun's vision for voyaging to Mars, and closing with Elon Musk's contemporary plan to get there, this volume traces major events like the founding of NASA, the first American astronauts in space, the moon landings, the Challenger disaster, the daring Hubble Telescope repairs, and more. In these pages, we find such gems as Eisenhower's reactions to Sputnik, the original NASA astronaut application, John Glenn's reflections on zero gravity, Kennedy's directives to go to the moon, discussions on what Neil Armstrong's first famous first words should be, customs forms filled out by astronauts bringing back moon rocks, transcribed conversations with Nixon on ending Project Apollo and beginning the space shuttle program, and so much more.

### **NASA at 50**

## **Life on Other Worlds**

Are we alone in the universe? From canals on Mars to the search for ET, the debate goes on. Lucid and accessible, this otherworldly guide chronicles the history of the 20th century obsession with extraterrestrials.

## **NASA's First 50 Years**

Here men from the planet earth. First set foot upon the moon - July 1969 A.D. We Came in peace for all mankind. From the plaque on the Eagle, Apollo 11, which landed on the moon on July 20, 1969.

## **Nasa At 50**

Apollo in Perspective: Spaceflight Then and Now takes a retrospective look at the Apollo space program and the technology that was used to land a man on the Moon. Using simple illustrations and school-level mathematics, Jonathan Allday explains the basic physics and technology of spaceflight and conveys the huge technological strides that were made and the dedication of the people working on the program. Physics topics covered include the laws of motion, rocketry, how to maneuver in orbit, and more. Informal and engaging, the book also discusses the

designs of the Apollo Command, Service and Lunar modules and how these changed as the plans for the manned mission evolved. Guidance systems, computers, and engines all had to be developed for the first time. With Apollo as background, the book proceeds to look at the space shuttle, the technology being developed for its replacement, the International Space Station, and the possibilities for a manned Mars mission. The book concludes with an exploration of the far future, including Mars colonies and journeys to other stars.

### **Air & Space Smithsonian**

"Fifty years after the founding of NASA, from 28 to 29 October 2008, the NASA History Division convened a conference whose purpose was a scholarly analysis of NASA's first 50 years. Over two days at NASA Headquarters, historians and policy analysts discussed NASA's role in aeronautics, human spaceflight, exploration, space science, life science, and Earth science, as well as crosscutting themes ranging from space access to international relations in space and NASA's interaction with the public. The speakers were asked to keep in mind the following questions: What are the lessons learned from the first 50 years? What is NASA's role in American culture and in the history of exploration and discovery? What if there had never been a NASA? Based on the past, does NASA have a future? The results of those papers, elaborated and fully referenced, are found in this 50th anniversary volume."--Introduction.

## **Project Mercury**

Take a tour of the universe with this breathtaking collection of photographs from the archives of NASA. Astonishing images of Earth from above, the phenomena of our solar system, and the celestial bodies of deep space will captivate readers and photography lovers with an interest in science, astronomy, and the great beyond. Each extraordinary photograph from the legendary space agency is paired with explanatory text that contextualizes its place in the cosmic ballet of planets, stars, dust, and matter—from Earth's limb to solar flares, the Jellyfish Nebula to Pandora's Cluster. Featuring a preface by Bill Nye, this engaging ebook offers up-close views of our remarkable cosmos, and sparks wonder at the marvels of Earth and space.

## **Shoot for the Moon**

A colourful history of 170 years of scientific discovery at the United States Naval Observatory.

## **Johnson Space Center**

In December 1968, the crew of Apollo 8 captured images depicting Earth hanging

like a lonely fruit in the vast darkness of space. The social and spiritual shock of that photograph—and those which followed—never fully diminished, even as Apollo missions followed at an incredible pace, including the first lunar landing on July 20, 1969. Moonshots is the definitive photographic chronicle of NASA space exploration—a giant slipcased book featuring more than 200 remarkable photographs from that eventful era created almost exclusively on large-format Hasselblad cameras. Though a number of these images have been reproduced in books and magazines over the years, one attribute of this incredible collection has seldom been exploited: the sheer size and resolution of the photography. Aerospace author Piers Bizony scoured NASA’s archives of Hasselblad film frames to assemble the space fan’s ultimate must-have book—a gorgeous large-format hardcover presented in a heavy slipcase with die-cuts to represent the phases of the moon. This resulting volume extracts a stunning selection of photographs captured by astronauts using Hasselblad equipment, many of them seldom previously published, let alone in such a lavish package. The Apollo voyages form the centerpiece of this amazing collection, but equally fabulous images from precursor Gemini missions are also featured, along with later photographs chronicling Space Shuttle missions and even the construction of the International Space Station.

## **NASA 50th Anniversary Proceedings. NASA's First 50 Years**

In *The Art of NASA*, ultra-rare artworks illustrate a unique history of NASA hardware and missions from 1958 to today, giving readers an unprecedented look at how spacecraft, equipment, and missions evolved--and how they might have evolved.

### **The Art of NASA**

### **Societal Impact of Spaceflight**

Prepare to embark on a journey through space and time with *The NASA Archives*, a visual celebration of humankind's unstoppable urge to travel away from Earth to worlds beyond. Featuring more than 400 historic photographs and rare concept renderings, this collection guides us through NASA's 60-year history, from its earliest days to its current

### **NASA's First 50 Years**

Chronicles the history of the U.S. space program

### **NASA's First A**

## **Earth and Space**

### **NASA in the World**

NASA SP-2009-1704. Steven J. Dick, Editor. Based on a symposium held on October 28-29, 2008 at NASA. Scholars turn a critical eye toward NASA's first 50 years.

### **Mars**

A visual history of NASA's many achievements in manned and unmanned space travel, written by a team of experienced NASA staffers and illustrated with more than 400 images, many of which are previously unpublished photographs from NASA archives. The story of America's Space Age begins in the 1950s with intrepid test pilots venturing ever faster and higher, and opens out into the now-legendary Mercury and Apollo missions of the 1960s that made astronauts into national heroes. The Space Shuttle era shows us what everyday space travel might look like, while grand vistas of the universe expand our sense of wonder. The large format of the book captures both the human drama and the vast scale of NASA's projects.--From publisher description.

## **The Biological Universe**

The New York Times bestselling, “meticulously researched and absorbingly written” (The Washington Post) story of the trailblazers and the ordinary Americans on the front lines of the epic Apollo 11 moon mission. President John F. Kennedy astonished the world on May 25, 1961, when he announced to Congress that the United States should land a man on the Moon by 1970. No group was more surprised than the scientists and engineers at NASA, who suddenly had less than a decade to invent space travel. When Kennedy announced that goal, no one knew how to navigate to the Moon. No one knew how to build a rocket big enough to reach the Moon, or how to build a computer small enough (and powerful enough) to fly a spaceship there. No one knew what the surface of the Moon was like, or what astronauts could eat as they flew there. On the day of Kennedy’s historic speech, America had a total of fifteen minutes of spaceflight experience—with just five of those minutes outside the atmosphere. Russian dogs had more time in space than US astronauts. Over the next decade, more than 400,000 scientists, engineers, and factory workers would send twenty-four astronauts to the Moon. Each hour of space flight would require one million hours of work back on Earth to get America to the Moon on July 20, 1969. “A veteran space reporter with a vibrant touch—nearly every sentence has a fact, an insight, a colorful quote or part of a piquant anecdote” (The Wall Street Journal) and in *One Giant Leap*, Fishman has written the sweeping, definitive behind-the-scenes account of the furious race to

complete one of mankind's greatest achievements. It's a story filled with surprises—from the item the astronauts almost forgot to take with them (the American flag), to the extraordinary impact Apollo would have back on Earth, and on the way we live today. From the research labs of MIT, where the eccentric and legendary pioneer Charles Draper created the tools to fly the Apollo spaceships, to the factories where dozens of women sewed spacesuits, parachutes, and even computer hardware by hand, Fishman captures the exceptional feats of these ordinary Americans. “It's been 50 years since Neil Armstrong took that one small step. Fishman explains in dazzling form just how unbelievable it actually was” (Newsweek).

### **Critical Issues in the History of Spaceflight**

In March 2005, the NASA History Division and the Division of Space History at the National Air and Space Museum brought together a distinguished group of scholars to consider the state of the discipline of space history. This volume is a collection of essays based on those deliberations. The meeting took place at a time of extraordinary transformation for NASA, stemming from the new Vision of Space Exploration announced by President George W. Bush in January 2004: to go to the Moon, Mars, and beyond. This Vision, in turn, stemmed from a deep reevaluation of NASA's goals in the wake of the Space Shuttle Columbia accident and the recommendations of the Columbia Accident Investigation Board. The new goals

were seen as initiating a "New Age of Exploration" and were placed in the context of the importance of exploration and discovery to the American experiences. (Amazon).

### **Space, Time, and Aliens**

#### **Space**

In this comprehensive and interdisciplinary volume, former NASA Chief Historian Steven Dick reflects on the exploration of space, astrobiology and its implications, cosmic evolution, astronomical institutions, discovering and classifying the cosmos, and the philosophy of astronomy. The unifying theme of the book is the connection between cosmos and culture, or what Carl Sagan many years ago called the "cosmic connection." As both an astronomer and historian of science, Dr. Dick has been both a witness to and a participant in many of the astronomical events of the last half century. This collection of papers presents his reflections over the last forty years in a way accessible to historians, philosophers, and scientists alike. From the search for alien life to ongoing space exploration efforts, readers will find this volume full of engaging topics relevant to science, society, and our collective future on planet Earth and beyond.

## **Rise of the Rocket Girls**

NASA 's Johnson Space Center (JSC ) in Houston, Texas, has been the home of human spaceflight operations since its inception in 1961. The first US manned spaceflight controlled from its iconic Mission Control Center was in 1965. From JSC 's control center, engineers also helped place humans on another celestial body for the first time, operated 135 Space Shuttle missions, and expanded human spaceflight to an international endeavor. Housed on more than 1,600 acres just south of downtown Houston, the center is the curator for the precious samples returned from the moon, the base for the training of astronauts, and the developer of innovative engineering to support future exploration deep into the solar system and world-class technical research on earth.

## **Review and Assessment of Planetary Protection Policy Development Processes**

These interviews capture reflections from top decision-makers as the space agency was completing its first 50 years. Based on oral histories, the book offers insights from those responsible for moving NASA through a deep transition - from the end of the Space Shuttle Program, the centerpiece of human spaceflight for three decades, to the goals of the new policy known as the Vision for Space Exploration.

## **America in Space**

In honor of the 50th anniversary of the groundbreaking Apollo 11 mission, this lavishly illustrated book--written by acclaimed science author Rod Pyle--tells the incredible story of the first men on the moon. Featuring stunning images and previously unpublished documents found in NASA archives and private collections, this gorgeously designed volume provides compelling firsthand accounts, exclusive interviews, accessible explanations of technical problems, and a strong, suspenseful narrative.

## **One Giant Leap**

How, asks James E. Strick, could spontaneous generation--the idea that living things can suddenly arise from nonliving materials--come to take root for a time (even a brief one) in so thoroughly unsuitable a field as British natural theology? No less an authority than Aristotle claimed that cases of spontaneous generation were to be observed in nature, and the idea held sway for centuries. Beginning around the time of the Scientific Revolution, however, the doctrine was increasingly challenged; attempts to prove or disprove it led to important breakthroughs in experimental design and laboratory techniques, most notably sterilization methods, that became the cornerstones of modern microbiology and

sped the ascendancy of the germ theory of disease. The Victorian debates, Strick shows, were entwined with the public controversy over Darwin's theory of evolution. While other histories of the debates between 1860 and 1880 have focused largely on the experiments of John Tyndall, Henry Charlton Bastian, and others, Sparks of Life emphasizes previously understudied changes in the theories that underlay the debates. Strick argues that the disputes cannot be understood without full knowledge of the factional infighting among Darwinians themselves, as they struggled to create a socially and scientifically viable form of Darwinian science. He shows that even the terms of the debate, such as biogenesis, usually but incorrectly attributed to Huxley, were intensely contested.

## **The Penguin Book of Outer Space Exploration**

Learn why NASA astronaut Mike Collins calls this extraordinary space race story "the best book on Apollo": this inspiring and intimate ode to ingenuity celebrates one of the most daring feats in human history. When the alarm went off forty thousand feet above the moon's surface, both astronauts looked down at the computer to see 1202 flashing on the readout. Neither of them knew what it meant, and time was running out . . . On July 20, 1969, Neil Armstrong and Buzz Aldrin became the first humans to walk on the moon. One of the world's greatest technological achievements -- and a triumph of the American spirit -- the Apollo 11 mission was a mammoth undertaking involving more than 410,000 men and

women dedicated to winning the space race against the Soviets. Set amid the tensions and upheaval of the sixties and the Cold War, *Shoot for the Moon* is a gripping account of the dangers, the challenges, and the sheer determination that defined not only Apollo 11, but also the Mercury and Gemini missions that came before it. From the shock of Sputnik and the heart-stopping final minutes of John Glenn's Mercury flight to the deadly whirligig of Gemini 8, the doomed Apollo 1 mission, and that perilous landing on the Sea of Tranquility -- when the entire world held its breath while Armstrong and Aldrin battled computer alarms, low fuel, and other problems -- James Donovan tells the whole story. Both sweeping and intimate, *Shoot for the Moon* is "a powerfully written and irresistible celebration" of one of humankind's most extraordinary accomplishments (Booklist, starred review).

### **The Space Shuttle**

The untold story of the historic voyage to the moon that closed out one of our darkest years with a nearly unimaginable triumph In August 1968, NASA made a bold decision: in just sixteen weeks, the United States would launch humankind's first flight to the moon. Only the year before, three astronauts had burned to death in their spacecraft, and since then the Apollo program had suffered one setback after another. Meanwhile, the Russians were winning the space race, the Cold War was getting hotter by the month, and President Kennedy's promise to put a man

on the moon by the end of the decade seemed sure to be broken. But when Frank Borman, Jim Lovell and Bill Anders were summoned to a secret meeting and told of the dangerous mission, they instantly signed on. Written with all the color and verve of the best narrative non-fiction, *Apollo 8* takes us from Mission Control to the astronaut's homes, from the test labs to the launch pad. The race to prepare an untested rocket for an unprecedented journey paves the way for the hair-raising trip to the moon. Then, on Christmas Eve, a nation that has suffered a horrendous year of assassinations and war is heartened by an inspiring message from the trio of astronauts in lunar orbit. And when the mission is over—after the first view of the far side of the moon, the first earth-rise, and the first re-entry through the earth's atmosphere following a flight to deep space—the impossible dream of walking on the moon suddenly seems within reach. The full story of *Apollo 8* has never been told, and only Jeffrey Kluger—Jim Lovell's co-author on their bestselling book about *Apollo 13*—can do it justice. Here is the tale of a mission that was both a calculated risk and a wild crapshoot, a stirring account of how three American heroes forever changed our view of the home planet.

### **Sky and Ocean Joined**

The riveting true story of the women who launched America into space. In the 1940s and 50s, when the newly minted Jet Propulsion Laboratory needed quick-thinking mathematicians to calculate velocities and plot trajectories, they didn't

turn to male graduates. Rather, they recruited an elite group of young women who, with only pencil, paper, and mathematical prowess, transformed rocket design, helped bring about the first American satellites, and made the exploration of the solar system possible. For the first time, *Rise of the Rocket Girls* tells the stories of these women -- known as "human computers" -- who broke the boundaries of both gender and science. Based on extensive research and interviews with all the living members of the team, *Rise of the Rocket Girls* offers a unique perspective on the role of women in science: both where we've been, and the far reaches of space to which we're heading. "If *Hidden Figures* has you itching to learn more about the women who worked in the space program, pick up Nathalia Holt's lively, immensely readable history, *Rise of the Rocket Girls*." -- *Entertainment Weekly*

### **NASA/ART**

Noted space and science author Piers Bizony's retrospective covers the entire Space Shuttle program from 1981 to 2011. Relive the history of one of America's most iconic spacecraft.

### **Moonshots**

The National Aeronautics and Space Administration is typically thought of in

national terms - as an American initiative developed specifically to compete with the Soviet Union. Yet, from its inception, NASA was mandated not only to sustain US leadership in space, but also to pursue international collaboration. Since that time, it has participated in over four thousand international projects. Drawing on unprecedented access to agency archives and personnel, this definitive study explores US-Soviet cooperation during the darkest days of the Cold War, relations with Western Europe, India, and Japan, the development of the International Space Station, and many other aspects of scientific and technological collaboration, making it a signal contribution to space studies and international diplomatic history.

### **Apollo 8**

### **The NASA Archives. 60 Years in Space**

### **Doing the Impossible**

Apollo was known for its engineering triumphs, but its success also came from a disciplined management style. This excellent account of one of the most important

personalities in early American human spaceflight history describes for the first time how George E. Mueller, the system manager of the human spaceflight program of the 1960s, applied the SPO methodology and other special considerations such as “all-up” testing, resulting in the success of the Apollo Program. Wernher von Braun and others did not readily accept such testing or Mueller’s approach to system management, but later acknowledged that without them NASA would not have landed astronauts on the Moon by 1969. While Apollo remained Mueller’s priority, from his earliest days at the agency, he promoted a robust post-Apollo Program which resulted in Skylab, the Space Shuttle and the International Space Station. As a result of these efforts, Mueller earned the sobriquet: “the father of the space shuttle.” Following his success at NASA, Mueller returned to industry. Although he did not play a leading role in human spaceflight again, in 2011 the National Air and Space Museum awarded him their lifetime achievement trophy for his contributions. Following the contributions of George E. Mueller, in this unique book Arthur L. Slotkin answers such questions as: exactly how did the methods developed for use in the Air Force ballistic missile programs get modified and used in the Apollo Program? How did George E. Mueller, with the help of others, manage the Apollo Program? How did NASA centers, coming from federal agencies with cultures of their own, adapt to the new structured approach imposed from Washington? George E. Mueller is the ideal central character for this book. He was instrumental in the creation of Apollo extension systems leading to Apollo, the Shuttle, and today’s ISS and thus was a pivotal figure in early American

human spaceflight history.

## **Apollo in Perspective**

This book is the first history of the twentieth century extraterrestrial life debate.

## **Sparks of Life**

## **Humans to Mars**

Catchpole tells the fascinating story behind the development of the first American manned space program and its associated infrastructure. He provides accounts of the space launch vehicles, astronauts and their training, tracking systems and individual flights.

## **NASA & the Exploration of Space**

Protecting Earth's environment and other solar system bodies from harmful contamination has been an important principle throughout the history of space exploration. For decades, the scientific, political, and economic conditions of space

exploration converged in ways that contributed to effective development and implementation of planetary protection policies at national and international levels. However, the future of space exploration faces serious challenges to the development and implementation of planetary protection policy. The most disruptive changes are associated with (1) sample return from, and human missions to, Mars; and (2) missions to those bodies in the outer solar system possessing water oceans beneath their icy surfaces. Review and Assessment of Planetary Protection Policy Development Processes addresses the implications of changes in the complexion of solar system exploration as they apply to the process of developing planetary protection policy. Specifically, this report examines the history of planetary protection policy, assesses the current policy development process, and recommends actions to improve the policy development process in the future.

### **Apollo Expeditions to the Moon**

A half-century ago, mankind's journey to the stars began with the launch of Sputnik 1. Sir Patrick Moore, the world's most famous amateur astronomer, and space photographer HJP Arnold have combined their talents to chronicle this entire exciting period. Featuring the finest images beautifully reproduced, it relives all the amazing advances and discoveries, from the first manned spaceflight to the first moon landing, from the first Space Shuttle to the first probes that went to the outer

planets and beyond. The engaging text showcases Moore's trademark clarity, simplicity, passion, and authority, and Arnold's photographs capture the drama, scale, majesty, and minutiae of the Universe. Also included: a countdown of the 50 Greatest Ever Space Images as chosen by Arnold.

## **First on the Moon**

## **NASA's First Space Shuttle Astronaut Selection**

Ranging from the establishment of NASA in 1958 to the present day, the history of space exploration is chronicled through the work of some of the world's most renowned artists, including Robert Rauschenberg, Andy Warhol, Norman Rockwell, James Wyeth, Alexander Calder, Nam June Paik, William Wegman, and Annie Leibovitz, among others.

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