



Reader's Guide

Fascinating and forbidding, space has drawn the attention of humans since before recorded history. People have looked outward, driven by curiosity about the vast universe that surrounds Earth. Unaware of the meaning of the bright lights in the night sky above them, ancient humans thought they saw patterns, images in the sky of things in the landscape around them.

Slowly, humans came to realize that the lights in the sky had an effect on the workings of the planet around them. They sought to understand the movements of the Sun, the Moon, and the other, brighter objects. They wanted to know how those movements related to the changing seasons and the growth of crops.

Still, for centuries, humans did not understand what lay beyond the boundaries of Earth. In fact, with their limited vision, they saw a limited universe. Ancient astronomers relied on naked-eye observations to chart the positions of stars, planets, and the Sun. In the third century B.C.E., philosophers concluded that Earth was the center of the universe. A few dared to question this prevailing belief. In the face of overwhelming opposition and ridicule, they persisted in trying to un-

derstand the truth. This belief ruled human affairs until the scientific revolution of the seventeenth century, when scientists used the newly invented telescope to prove that the Sun is the center of Earth's galaxy.

Over time, with advances in science and technology, ancient beliefs were exposed as false. The universe ever widened with humans' growing understanding of it. The dream to explore its vast reaches passed from nineteenth-century fiction writers to twentieth-century visionaries to present-day engineers and scientists, pilots, and astronauts.

The quest to explore space intensified around the turn of the twentieth century. By that time, astronomers had built better observatories and perfected more powerful telescopes. Increasingly sophisticated technologies led to the discovery that the universe extends far beyond the Milky Way and holds even deeper mysteries, such as limitless galaxies and unexplained phenomena like black holes. Scientists, yearning to solve those mysteries, determined that one way to accomplish this goal was to penetrate space itself.

Even before the twentieth century, people had discussed ways to travel into space. Among them were science fiction writers, whose fantasies inspired the visions of scientists. Science fiction became especially popular in the late nineteenth century, having a direct impact on early twentieth-century rocket engineers who invented the fuel-propellant rocket. Initially developed as a weapon of war, this new projectile could be launched a greater distance than any human-made object in history, and it eventually unlocked the door to space.

From the mid-twentieth century until the turn of the twenty-first century, the fuel-propellant rocket made possible dramatic advances in space exploration. It was used to propel unmanned satellites and manned space capsules, space shuttles, and space stations. It launched an orbiting telescope that sent spectacular images of the universe back to Earth. During this era of intense optimism and innovation, often called the space age, people confidently went forth to conquer the distant regions of space that have intrigued humans since early times. They traveled to the Moon, probed previously uncharted realms, and contemplated trips to Mars.

Overcoming longstanding rivalries, nations embarked on international space ventures. Despite the seemingly unlimited

technology at their command, research scientists, engineers, and astronauts encountered political maneuvering, lack of funds, aging spacecraft, and tragic accidents. As the world settled into the twenty-first century, space exploration faced an uncertain future. Yet, the ongoing exploration of space continued to represent the “final frontier” in the last great age of exploration.

Space Exploration: Biographies captures the height of the space age in twenty-five entries that profile astronauts, scientists, theorists, writers, and spacecraft. Included are astronauts Neil Armstrong, John Glenn, Mae Jemison, and Sally Ride; cosmonaut Yuri Gagarin; engineer Wernher von Braun; writer H. G. Wells; and the crew of the space shuttle *Challenger*. The volume also contains profiles of the Hubble Space Telescope and the International Space Station. Focusing on international contributions to the quest for knowledge about space, this volume takes readers on an adventure into the achievements and failures experienced by explorers of space.

Features

The entries in *Space Exploration: Biographies* contain sidebar boxes that highlight topics of special interest related to the profiled individual. Each entry also offers a list of additional sources that students can go to for more information. More than sixty black-and-white photographs illustrate the material. The volume begins with a timeline of important events in the history of space exploration and a “Words to Know” section that introduces students to difficult or unfamiliar terms. The volume concludes with a general bibliography and a subject index so students can easily find the people, places, and events discussed throughout *Space Exploration: Biographies*.

Space Exploration Reference Library

Space Exploration: Biographies is only one component of the three-part Space Exploration Reference Library. The other two titles in this set are:

- ***Space Exploration: Almanac*** (two volumes) presents, in fourteen chapters, key developments and milestones in the continuing history of space exploration. The focus ranges from ancient views of a Sun-centered universe to the scientific understanding of the laws of planetary mo-

tion and gravity, from the launching of the first artificial satellite to be placed in orbit around Earth to current robotic explorations of near and distant planets in the solar system. Also covered is the development of the first telescopes by men such as Hans Lippershey, who called his device a “looker” and thought it would be useful in war, and Galileo Galilei, who built his own device to look at the stars. The work also details the construction of great modern observatories, both on ground and in orbit around Earth, that can peer billions of light-years into space and, in doing so, peer billions of years back in time. Also examined is the development of rocketry; the work of theorists and engineers Konstantin Tsiolkovsky, Robert H. Goddard, and others; a discussion of the Cold War and its impact on space exploration; space missions such as the first lunar landing; and great tragedies, including the explosions of U.S. space shuttles *Challenger* and *Columbia*.

- ***Space Exploration: Primary Sources*** (one volume) captures the highlights of the space age with full-text reprints and lengthy excerpts of seventeen documents that include science fiction, nonfiction, autobiography, official reports, articles, interviews, and speeches. Readers are taken on an adventure spanning a period of more than one hundred twenty-five years, from nineteenth-century speculations about space travel through twenty-first century plans for human flights to Mars. Included are excerpts from science fiction writer Jules Verne’s *From the Earth to the Moon*; Tom Wolfe’s *The Right Stuff*, which chronicles the story of America’s first astronauts; astronaut John Glenn’s memoirs; and president George W. Bush’s new vision of space exploration.
- A cumulative index of all three titles in the Space Exploration Reference Library is also available.

Comments and Suggestions

We welcome your comments on *Space Exploration: Biographies* and suggestions for other topics to consider. Please write: Editors, *Space Exploration: Biographies*, U•X•L, 27500 Drake Rd. Farmington Hills, Michigan 48331-3535; call toll-free: 1-800-877-4253; fax to (248) 699-8097; or send e-mail via <http://www.gale.com>.