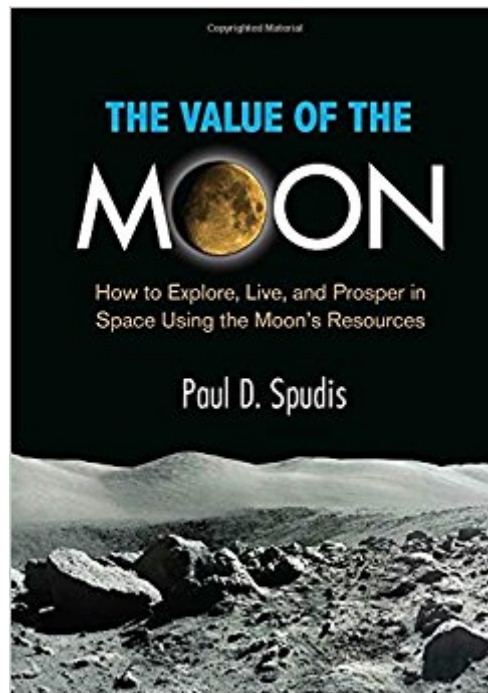




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The Value Of The Moon: How To Explore, Live, And Prosper In Space Using The Moon's Resources



Synopsis

While the Moon was once thought to hold the key to space exploration, in recent decades, the U.S. has largely turned its sights toward Mars and other celestial bodies instead. In *The Value of the Moon*, lunar scientist Paul Spudis argues that the U.S. can and should return to the moon in order to remain a world leader in space utilization and development and a participant in and beneficiary of a new lunar economy. Spudis explores three reasons for returning to the Moon: it is close, it is interesting, and it is useful. The proximity of the Moon not only allows for frequent launches, but also control of any machinery we place there. It is interesting because recorded deep on its surface and in its craters is the preserved history of the moon, the sun, and indeed the entire galaxy. And finally, the moon is useful because it is rich with materials and energy. The moon, Spudis argues, is a logical base for further space exploration and even a possible future home for us all. Throughout his work, Spudis incorporates details about man's fascination with the moon and its place in our shared history. He also explores its religious, cultural, and scientific resonance and assesses its role in the future of spaceflight and our national security and prosperity.

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Customer Reviews

"It holds the secrets of our distant past. It is the key to our future in space. And best of all, it is right next door." In this compelling book, one of the world's top lunar scientists shows why, if we really want to get to Mars, we must begin on the Moon." -- Andrew Chaikin, author of *A Man on the Moon*

"A lucidly written exploration of why the Moon has always been part of our culture

and how it could be humanity's future home and resource base. -- Francis French, co-author of *Falling to Earth* and author of *In the Shadow of the Moon* -- "Paul Spudis provides a compelling rationale of why the Moon constitutes America's critical stepping stone into deeper regions of space. As Dr. Spudis clearly articulates, any successful mission to Mars requires the development of the Moon, which would also provide a long-term fusion energy resource for the Earth and space propulsion. -- Harrison H. Schmitt, Apollo 17 astronaut, geologist, former U.S. Senator

KIRKUS REVIEWS Renowned geologist and lunar scientist Spudis (*Blogging the Moon*, 2011, etc.) makes a compelling argument that the moon's many available resources may jump-start mankind's pursuit of space travel. In the late 2000s, the news that the moon holds millions, possibly billions, of tons of ice at each pole stunned and excited the space science community. Ice is invaluable for two major reasons: it can be melted into liquid water, and its constituent parts (hydrogen and oxygen) can be harnessed and converted to rocket fuel. Additionally, lunar probes show that small areas near each pole are illuminated by the sun for most of the year, making them ideal locations for solar arrays to generate usable energy. The author writes that the lunar "resource bonanza" is tantalizing to those who hope to send humans back to the moon and beyond, as it eliminates the need for such resources to be hauled in from Earth. In approachable if at times technical prose, Spudis argues that the moon has everything we need to build a permanent moon base and that doing so can lay the foundation of a space transportation network. In fact, he argues that a manned trip to Mars may only be feasible if we establish a launch pad on the moon. To contextualize such an endeavor, this book is packed with historical, political, and cultural history about mankind's on-again, off-again relationship with the moon, a saga in which the author has been intimately entwined. Spudis also provides a literal road map to settling on the moon that is tremendously exciting to ponder. The author's deep knowledge and contagious optimism—even in the face of considerable government bureaucracy—make for fascinating reading that, happily, is not science fiction. A readable book sure to charm and thrill anyone interested in space exploration.

BOOKLISTS Since Spudis's prior popular work, *The Once and Future Moon* (1996), there has been a startling discovery: Earth's closest celestial neighbor has water. Involved in the research into this revelation, Spudis summarizes the evidence as a prelude to this book's main argument: that the objective of America's human spaceflight program should be a permanent presence on the moon. NASA is intent, instead, on reaching an asteroid or Mars. Criticizing those destinations for scientific and technical reasons, Spudis also asserts that NASA will never receive enough money for these destinations. Thus, space policy ought to refocus on the moon because, in Spudis's

repeated, slogan-like phrase, “it’s close, it’s interesting, and it’s useful.” Presenting a methodical plan to establish a base, Spudis insists his ideas are within NASA’s budget. If frugality doesn’t convince them, Spudis suggests a strategic competition, noting that there is a new race to the moon with just one contestant: China. Realistic in its attention to political constraints, Spudis’s lucid argument will persuade space enthusiasts that a return to the moon is the right direction for America’s space program.

• Gilbert Taylor

LIBRARY JOURNAL A solid choice for space enthusiasts and science/technology policy wonks.

FORBES The Value of the Moon should be required reading for anyone interested in the future of spaceflight.

CHOICE The Value of the Moon presents a strong case for returning crewed missions to the Moon and establishing a permanent lunar base as a principal goal of the United States space program. Author Spudis, a lunar scientist, has long been the leading spokesperson for engineers and scientists favoring these objectives. These missions would implement in situ resource utilization (ISRU), making the Moon a logical stepping stone to places beyond—especially Mars. ISRU would include extracting water from cold crater bottoms near the lunar poles, building structures with lunar materials, generating rocket propellant, and more—all done with solar power harvested from certain elevated polar locations that receive abundant sun exposure. However, when proposed programs have costs that exceed billions of dollars, the government, NASA, and the scientific community dominate. Lunar advocates have been unable to obtain funding for a manned program, as targeting Mars is preferred—see Human Spaceflight: From Mars to the Stars, by Louis Friedman (CH, Sep’16, 54-0184). Spudis’s work is recommended for undergraduates and above, as well as those who are interested in space policy or the future of space travel.

Paul D. Spudis is a senior lunar scientist with a PhD in Geology who specializes in the histories and processes of the terrestrial planets. He has won numerous awards for his work, including the NASA Distinguished Public Service Medal and the 2011 Space Pioneer Award of the National Space Society. He has authored more than one hundred scientific papers and six books, including *The Once and Future Moon*.

A very well written account and compelling argument of the value of the Moon as a stepping stone to future exploration of space. This is a well written book, concise, accurate, up to date, good editing, making a very strong arguments for why the Moon is an essential waypoint for the future of

space exploration. The historical perspective of our relationship with the Moon was also excellent. A few shortcomings include the author's redundant arguments for the reasons why the Moon is the only rational path to the future of space exploration. This argument was repeated throughout most of the chapters, so much so that I memorized the argument! This space could have been used for additional information on the resurgence of recent scientific findings of lunar science, which is basically the author's specialty. The author made no mention of potential ethical issues regarding the exploitation of the Moon's natural resources and how waste products would be handled. He does mention legal issues in terms of mining rights, and property ownership, etc. There was no mention of the recent discovery of underground caves which could be used to establish larger lunar habitats'. The books illustrations were also poor, dark and too few. With all of the great images we now have I expected better from the publisher. The likelihood of NASA heeding Dr. Spudis' advice is nearly nil. His plan has too many milestones, and is protracted, in terms of return on investment, and will likely not "wow" the American people in terms of a clear and quick goal (as compared to landing man on Mars). Most people will quickly become bored with the program and not appreciate the significance of the incremental accomplishments that will be made over a couple of decades. Given the current socio-economic global climate, the money required to sustain such a protracted effort would be quickly reallocated to other programs with each changing administration. This scenario may change if China makes such a commitment (which is more likely). Then the US will be scrambling to catch up with the Chinese. Basically, a repeat of Sputnik. We will then resort to the Apollo template that the author discusses to upstage the competition with a crash development program (no pun intended) to send man to Mars. The Value of the Moon is a very timely book. It will change the way you see the Moon the next time you look up in the night sky.

Interesting book. It was insightful to compare the plan proposed by Paul Spudis for exploration and colonization of space with that of Robert Zubrin's (The Case for Mars ISBN 978-1-4516-0811-3). Paul thinks there are huge amounts of water, in the form of ice, which are languishing in lunar craters on the north and south lunar poles. He presents evidence for this (e.g., increased hydrogen levels recorded by lunar orbiters in areas near the poles). Robert Zubrin believes there is very little water on the Moon. He recommends bypassing the Moon and heading straight for Mars where we know there is water. Spudis presents a "stepping stone" approach that envisions using lunar resources to produce rocket fuel, and other materials to build and fuel vehicles that could travel between Earth and Moon and eventually throughout our solar nebula . I believe the Spudis plan is the best, but only if factual data confirming the amount of lunar water ice that Spudis suggests can

be confirmed. The Mars lander Phoenix turned up small chunks of bright material that disappeared after four days, leading scientists to surmise that they were pieces of water ice. The lander went on to detect water vapor in a sample it collected and analyzed, confirming the presence of frozen water on the red planet. Sending lunar rovers to investigate the deep, dark craters near the lunar poles could possibly resolve the question about how much water is on our Moon.

Well written. Learned a lot.

I am an Earth Science graduate student, and I think this is a must read for anyone interested in space travel, the moon, or mankind's future in space. The book is very well written and easy to read, and it covers all the important political, scientific, and environmental histories, benefits, and possibilities related to space travel. A highly recommended read.

I found the book interesting, and informative. I was already familiar with many of the people and events, but it did have much new information.

Must read!

This book makes the case for going to the Moon as the next step in manned space program. The author argues against the current focus on Mars or near-Earth asteroids and presents the case for a manned Moon program.

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