BOOK REVIEW

The Future of Geography: How Power and Politics in Space Will Change Our World

Tim Marshall (Elliott Thompson, 2023), 320

1

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"The Future of Geography: How Power and Politics in Space Will Change Our World," by Tim Marshall, offers an in-depth analysis of the geopolitical aspects of space exploration. The book's main argument is that space has become an essential part of the geopolitical landscape of Earth, offering substantial potential for exploration and resource utilization while simultaneously bringing complexities and the risk of conflict. The future of space exploration and utilization will significantly impact humanity, necessitating careful consideration of political, military, and ethical issues.

The book's ten chapters are divided into three sections, each addressing the historical, contemporary, and future consequences of space on human societies and global politics. It studies the increasing roles of major powers such as the United States, China, and Russia in space. It introduces the concept of astropolitics, examining the impact of the space domain on international relations and its role in shaping future global dynamics.

The book also offers a comprehensive and insightful analysis of the interplay between space exploration and geopolitics, skillfully merging historical narratives with contemporary developments to project potential future trajectories. The remarkable quality of the book lies in its capacity to simplify complex geo-

political concepts into an easily understandable format, providing an asset for a wide range of readers.

The first section, titled "The Path to the Stars," studies the ancient connection of humanity with the skies and the progression of our understanding of space. This section covers space's historical background and ongoing impact in shaping human societies and geopolitics. The writer explores the human fascination with space as a source of inspiration and a critical factor in the development of civilization, acknowledging that "space has shaped human life from our very beginning."

Ancient civilizations interpreted the stars and constellations as part of their mythologies and legends, with different cultures seeing different shapes in the sky based on their environment and folklore. For example, people in hotter climates might see scorpions or lions, while those in colder areas might identify a moose in the stars.

There is evidence that as far back as 30,000 years ago, in the late Paleolithic era, individuals were engaged in observing celestial bodies, potentially utilizing lunar calendars etched into bones. The author further explains the impact of celestial event interpretations on early human societies' cultural and religious beliefs by emphasizing the practical significance of space observation in fields like navigation, timekeeping, and agriculture, highlighting its contribution to societal well-being.

This part also addresses the development of space technology, highlighting that terrestrial conflicts, especially the Cold War, ultimately drove humanity into the field of space. The author quotes Russian scientist Tsiolkovsky, who said, "Earth is the cradle of humanity, but one cannot stay in the cradle forever," encapsulating the human's space fantasy.

There are traces of the historical advancement of rocket technology, starting with early Chinese innovations involving gunpowder and progressing through the substantial contributions

made by trailblazers such as Konstantin Tsiolkovsky, Robert Goddard, and Hermann Oberth. One fascinating tale is the legendary attempt by Wan Hu, a Chinese official from the 16th century, who attached rockets to a chair in a failed attempt to reach the stars. While lacking historical evidence, the story has captured the imagination, leading to a crater on the Moon named after Wan Hu.

The second part of the book, titled "Right Here, Right Now," provides a comprehensive analysis of the present state of global space exploration, emphasizing the roles of various states in shaping the future of space politics and technology. The author describes the space ambitions of the US, highlighting the debate over returning to the Moon, the challenges and evolution of the National Aeronautics and Space Administration (NASA), the Artemis Program, and the formation of the specific military branch known as the Space Force. He also discusses the joint venture between NASA, the European Space Agency, and the Japanese and Canadian space agencies, supported by SpaceX Falcon Heavy rockets, for the Lunar Gateway Space Station near the Moon, which would be used as a docking station. This chapter also covers the strategic implications of space exploration and the potential for the militarization of the Moon, stating that "Hawks among astropolitical thinkers are confident that because space militarization is happening, the way ahead is to escalate first, and to a level that competitors cannot match."

The author then shifts the focus to Russia, examining how sanctions have affected its space program since 2014. This includes exploring the strain on relationships with global partners, a pivot towards militarizing space capabilities, and reducing its space market share. The book underscores the advancement of capabilities related to space warfare and emphasizes the importance of the Vostochny Cosmodrome. This Russian spaceport was designed to diminish reliance on the Baikonur Cosmodrome in Kazakhstan for Russia's space initiatives. The author explains how growing space collaboration between Russia and China

has helped Moscow stay relevant in the space race and how Russia's role in space is gradually diminishing.

Focusing on China, Marshall highlights critical aspects like the Tiangong space station, illustrating its advanced capabilities for supporting extended manned space missions. He discusses the militarization of the program, which includes the development of satellites for surveillance, communication, and even anti-satellite capabilities, and China's technological advancement, covering satellite technology, rover missions – such as those to the Moon and Mars – and manned spaceflights. The impact of the space industry on economic growth, including job creation, the development of new industries, like satellite services and space tourism, and advancements in related fields like telecommunications, materials science, and robotics has been discussed. Innovations like the Shenlong spaceplane, a project aimed at developing a potentially reusable spaceplane, and plans for the International Lunar Research Station (ILRS), a joint project between China and Russia to establish a research station on the Moon, have also been highlighted.

The traditional giants in the space exploration arena are no longer the sole players, as viewed by the author. The landscape has become increasingly competitive as various states and private enterprises struggle for a foothold in this expanding field. Prominent figures like Jeff Bezos with Blue Origin, Richard Branson with Virgin Galactic, and Elon Musk with SpaceX have entered the fray. Alongside these private sector entities, a plethora of states, including France, Germany, Japan, Australia, India, the United Kingdom, Israel, Iran, and the United Arab Emirates, have been actively seeking opportunities for projects and partnerships, aiming to carve out their prestige in a space market that has become ever more congested.

The book's third part, titled "Future Past," explores various future scenarios in space, reflecting on the profound implications and challenges ahead in this new frontier. This section begins with a discussion on the potential for "Space Wars," highlighting that

"each time humanity has ventured into a new domain it has brought war with it. Like shipbuilding resulted in warships, and airplanes brought fighter jets and bombers, space is no different and the potential battlefield is beginning to take shape." This risk of conflict in space between various states and private entities is due to the lack of peaceful operation frameworks, involvement of multiple countries, and strategic tensions at locations like Lagrange points and Moon bases.

This part also covers the vast commercial opportunities created in space, such as space hotels, civilian flights, and unique services like galactic funerals, while also addressing associated risks, like the possibility of extensive advertising in the night sky. The author discusses the construction of sophisticated satellite systems, primarily by the US, underscoring the growing geopolitical tensions in space and the urgent need for international treaties to prevent state conflicts.

Additionally, he discusses the economic potential of states in space, with advancements like space solar panels, space factories, and mining the Moon and asteroids for resources. Given the competitive nature of major space powers, there is a need for updated legal frameworks and international cooperation.

The book envisions future human settlements on the Moon and Mars, driven by human curiosity and competitive spirit despite the challenges. Marshall also examines the health risks of space habitation, highlighting the necessity for artificial gravity and exploring the competitive pursuit of limited resources such as helium and lunar water. This marks the pressing significance of space exploration and resource utilization.

Marshall's prowess lies in his thorough exploration of various spacefaring ambitions and strategies of the states, providing a detailed examination of how space exploration has increasingly become a domain of geopolitical competition and collaboration. His analysis of how states like the US, China, Russia, and emerging players in space technology are positioning them-

selves on this emerging frontier is incredibly enlightening. The book adeptly underscores the strategic significance of space in terms of national security, technological prowess, and economic opportunities, effectively linking these elements to the broader context of global politics.

While this book is a remarkable read, it is not without its limitations. An important observation is the predominantly Western perspective of the author, which might shape its depiction of non-Western spacefaring states such as China and Russia. This viewpoint could result in a biased portrayal of aspirations and activities in the space of these states, potentially oversimplifying intricate motives or failing to explore the subtleties of their space initiatives thoroughly. A more equitable approach, integrating a variety of viewpoints, could have enhanced the analysis, providing a more comprehensive understanding of the worldwide competition in space exploration.

This book is commendable for its foresight in predicting future scenarios. However, some of these projections might be speculative, requiring readers to engage critically with the material and consider alternative outcomes. The dynamic and rapidly evolving nature of space technology and international relations means that predictions can quickly become outdated or overtaken by new developments.

The book significantly contributes to the literature on space and geopolitics. Its easy writing style, combined with a comprehensive coverage of the subject matter, makes it an essential read for understanding the geopolitical implications of space exploration. While mindful of its Western-centric viewpoint and the speculative nature of some forecasts, the reader will find the book enlightening and thought-provoking. It is a critical resource for comprehending the evolving role of space in shaping global politics and human progress.

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