Book Review: Reaching for the Moon: The Autobiography of NASA Mathematician Katherine Johnson

Title: *Reaching for the Moon: The Autobiography of NASA Mathematician Katherine Johnson*

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The 2016 movie *Hidden Figures* defied box office estimates and made over $200 million both abroad and in the United States. While Hollywood would argue that where multi-million-dollar action films filled with violence, profanity, and strife raked in the most profit, this movie proved that audiences revealed at a refreshing film about the academic mathematical and scientific achievements of black women. The movie is loosely based on the book of the same name, which highlighted the story of a team of female African-American mathematicians who served a vital role in NASA during the early years of the space program. The main character, Katherine Johnson, was urged to publish her autobiography after the movie was published, and this book review highlights her autobiography: *Reaching for the Moon: The Autobiography of NASA Mathematician Katherine Johnson*.

> "You are no better than anyone else, but nobody else is better than you."
>
> ~ *Katherine Johnson*

Reaching for the Moon is an easy-to-read book targeted for youth, but her message is resounding for all ages. The book begins by highlighting Katherine's humble beginnings as the youngest of four. Her love of math came naturally to her and she counted everything—stairs, flatware, and steps to and from a destination. While the term 'gifted' was not common during her upbringing, it was clear that

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academics came easy to Katherine. She could read and write at age 4, and was promoted several grades. Katherine graduated high school at age 13 and entered college at age 14. She highlighted how her father, with a 6th grade education, was very intelligent and insisted on all four of his children attending college. With his foresight and wisdom, Katherine became a Mathematician with the highest GPA to date and entered West Virginia University to pursue graduate school. She then became a teacher at a segregated school in Virginia.

Katherine emphasized the phrase her father told her at a young age, "You are no better than anyone else, but nobody else is better than you," several times in the book while she highlighted the ageism, classism, colorism, racism, wage discrimination, and sexism, she encountered both in the workplace and in the world during her 36-year career at the Langley Research center. This is NASA's oldest field center in Hampton, Virginia.

Katherine was one of the first 'computers' at Langley, which was a term coined for African-American women who computed calculations for space experiments. Katherine's autobiography highlights how she was instrumental in the success of several space programs; putting a man in orbit, putting a man on the moon, the Space Shuttle Program, the 1981 launch of Space Shuttle Columbia, and the first Earth Resources Satellite. Through the seven chapters, it is fascinating to follow the evolution of the space program through Katherine's eyes.

Katherine showed that space is more than just science. She is a well-qualified expert to critically evaluate NASA's influence on society, policy, politics, and sociocultural evolution. She emphasized the importance of making NASA's work relevant to American citizens—calculators, radios, and TVs were all invented in the NASA space program, not to mention improving pacemakers and weather forecasts. She emphasized to remain curious and to ask questions: "But if you want to know the answer to something, you have to ask the question. Always remember that there's no such thing as a dub question except if it goes unasked. Girls and women are capable of doing everything that boys and men are capable of doing."

Katherine's story is not without heartache. She became a single mother of three girls at age 34 when her husband died of complications related to a brain tumor. She had relatives drafted to the Korean and Vietnam wars, and lost an adult daughter. She highlights that despite her intelligence and potential, there were limited opportunities for her. She often assumed extra jobs to make ends meet because her income was a fraction of her white, male counterparts. As she said in the book, "Bad things happen, then life goes on."

> [Tutoring], "speaks life into a young person's spirit and helps expand the vision of what's possible for his or her future, especially as it involves math and science."
>
> ~ *Katherine Johnson*

Through all of her triumphs and setbacks she emphasized that her greatest joy was tutoring and encouraging children. She emphasized that teaching was more than getting to the right answer, but rather, "helping students understand the background of what they were working on, how to figure out what the problem was, and then how to attack it. If you approach any problem properly, you'll get the answer."

In this easy-to-read book, she emphasizes that tutoring, "speaks life into a young person's spirit and helps expand the vision of what's possible for his or her future, especially as it involves math and science." **This book is a valuable resource for students, experts, and teachers of the space sciences and engineering. It will provide readers of all ages an invaluable understanding of the exciting human exploration of space at a time of significant societal and cultural evolution.**

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