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The mathematician Katherine Johnson at her desk in NASA's Langley Research Center in 1966.

A hidden figure tells her story

Although she was well known in her local community of Hampton, Virginia, the mathematician Katherine Johnson (1918–2020) was absent from popular and scholarly accounts of the US's space program until the release of the 2016 film *Hidden Figures*. Based on a book of the same name by Margot Lee Shetterly, which was published that same year, the film depicts how Johnson and her colleagues in the West Area Computing Unit at NASA's Langley Research Center calculated spacecraft trajectories for the US human spaceflight program in the 1960s. It rocketed Johnson and the West "computers," who were some of the few Black women employed in technical roles at NASA during that era, to late-in-life (or, in some cases, posthumous) fame.

In her memoir *My Remarkable Journey*, written with the assistance of her beloved daughters Joylette Hylick and Katherine Moore and the writer Lisa Frazier Page, Johnson reflects on the trajectory of her life and career. She invites readers to join and learn from her journey, which brought her from rural West Virginia to the national spotlight and transformed her into a role model and American icon.

Johnson details how her training in ad-

vanced mathematics at West Virginia State College—a historically Black college—and West Virginia University, along with her focus and curiosity, enabled her to make important contributions to US aviation and space activities over her 33 years at NASA and its predecessor, the National Advisory Committee for Aeronautics. In addition to researching and calculating trajectories for crewed missions, including Project Mercury and the space shuttle program, Johnson also published NASA reference books and technical studies in support of Mars exploration. Her success challenged contemporary prejudices about which people were best suited to working in mathematics and related fields—prejudices that persist today, as women and people of color continue to be underrepresented in STEM (science, technology, engineering, and mathematics) jobs.

In the book, Johnson recounts how she pushed against workplace practices and policies that she found personally demeaning and detrimental to her research. For example, she questioned her colleagues—who were all white men—about the exclusion of "computers" from engineering group meetings. Motivated

My Remarkable Journey A Memoir

Katherine Johnson
with Joylette Hylick,
Katherine Moore, and
Lisa Frazier Page

Amistad, 2021. \$25.99



by a commitment to collaboration as well as an unshakable belief that she was "as good as anybody else," Johnson overcame her colleagues' inherent biases by appealing to their sense of pragmatism: She successfully argued that her attendance would enable the entire team to operate more effectively.

She also writes that, unlike in the film adaptation of *Hidden Figures*, she "hadn't paid attention" to the racially segregated restrooms at Langley. She suspects that her "fair skin complexion" may have enabled her to move in those spaces without challenge from her white peers.

Johnson's passion for her work was equaled by her enthusiasm for every other area of her life. She was a student; public school teacher; partner to James Goble and later James Johnson; parent to children Joylette, Constance, and Katherine; and a dedicated and active member of her community, church, and treasured Alpha Kappa Alpha Sorority. In many ways, *My Remarkable Journey* is a love letter to the people who brought meaning to her life and enabled her to pursue her goals. She writes with particular warmth about the educators who sparked her curiosity and supported her learning, including her mother Joylette Coleman and William Schieffelin Claytor, a mathematics professor at West Virginia State College who was one of the first Black Americans to receive a doctorate in his field.

Johnson and her coauthors excel at placing her actions, decisions, and experiences in historical context, which makes it possible even for readers unfamiliar with 20th-century US history to join Johnson on her life's path. The most compelling of those discussions highlight moments that deeply impressed Johnson and shaped her worldview. For example, background information on the 1957–58 International Geophysical Year serves as a foundation for understanding Johnson's attitudes toward early US space activities. Although

the year was ostensibly a global effort to study Earth sciences, it also became an arena for Cold War competition when the Soviet Union launched *Sputnik 1* in October 1957 and jump-started the space race.

Recalling the night she and her three daughters viewed the Soviet satellite from the front yard of their home, Johnson writes, “I felt that competitive American spirit rise in me.” Spurred by the feeling that the US couldn’t afford to lag behind

its Cold War rival, she would soon become an integral part of the American response to the Soviet challenge in space.

Johnson’s accessible memoir will engage readers of all ages and interests. It is a welcome addition to the bookshelf of anyone keen to know Johnson and learn more about Black women’s contributions to both the US space program and the exploration and understanding of our universe. For young people aspiring to

STEM careers, Johnson offers inspiration for navigating discrimination and self-doubt. For STEM professionals, her story underscores the importance of creating and maintaining equitable and inclusive learning and work environments so that everyone can pursue their own remarkable journeys.

Emily A. Margolis

National Air and Space Museum

Washington, DC



Although the “Copenhagen interpretation” of quantum mechanics may be a postwar invention, the Danish capital was indeed a major site for intellectual exchange during the quantum revolution of the 1920s. Pictured here is the lakeside street of Sortedam Dossering, which features some of the oldest neon lights in the city.

How I learned to stop worrying and love metaphysics

Anyone who has ever strolled through the science section at a Barnes & Noble knows that popular books on quantum mechanics abound. Jim Baggott, a prolific science writer with a PhD in chemical physics, has himself already written several successful popular texts dealing with quantum theory. Seeing that Baggott has now written another book on the topic, *Quantum Reality*, one might ask: Why? What makes Baggott’s newest book—one more in a long list of attempts to introduce the public to philosophical issues within quantum mechanics—stand out?

Fortunately, *Quantum Reality* quickly justifies its existence. Part 1 provides an entertaining yet compact introduction not just to the most important physical and formal features of quantum mechanics but also to the ways in which that physics opens itself—inevitably and irrevocably—to philosophical inquiry. Indeed, certain passages almost serve as tasty amuse-bouches for the entire field of philosophy of science, and in that way

Baggott’s book achieves broader appeal than its competitors.

The necessity of engaging with philosophy during the scientific process is nicely illustrated by the book’s central metaphor: scientific theorizing as a ship navigating the treacherous waters between Charybdis, representing the shores of metaphysical reality, and Scylla, the isle of empirical reality. How one chooses to navigate that metaphorical strait says much about which interpretation of quantum mechanics one finds particularly appealing or explanatory.

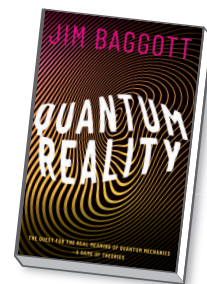
Part 2 introduces the different interpretations of quantum mechanics. Baggott groups the interpretations with respect to whether their adherents consider quantum mechanics to be complete. He discusses the interpretations in relation to the sailing metaphor and measures them against several neatly articulated “realist propositions.” Which of those propositions one is inclined to take as axiomatic and how one answers the completeness question will indicate which

Quantum Reality

Jim Baggott

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interpretation—or class thereof—one finds most appealing. That is a new way of tackling a very old question, and it helpfully foregrounds the costs and benefits of kindred approaches vis-à-vis the twin criteria of realism and completeness.

Among the less realist views Baggott discusses are relational interpretations, consistent (or decoherent) histories, and information-theoretic views like quantum Bayesianism. Those are important approaches typically left out of popular accounts. The chapters progress toward increasingly realist views and focus on “completion attempts” like Bohmian mechanics, spontaneous-collapse theories, and even views incorporating the agency or consciousness of the observer. Everettian approaches get the last word, but somewhere in the mix Baggott takes time to discuss pivotal aspects of the interpretational debate that are too often neglected,