



Hidden Figures Light Up Screen

Black Women Who Helped America Win the Space Race

JENNA P. CARPENTER

During World War II, the National Advisory Committee for Aeronautics (NACA) used computers to make advancements in aeronautics. Later, during the Cold War, NACA's successor, NASA, turned these computers to the task of tackling the challenges of putting Americans in space. At first this may not sound surprising, but in this era the word *computers* referred to people, not electronic or digital machines. Moreover, it was nearly lost to history that these computers were largely women, some of whom were African American.

In *Hidden Figures: The Untold Story of the Black Women Mathematicians Who Helped Win the Space Race* (William Morrow, 2016), Margot Lee Shetterly tells the surprising story of the West Computers division—a segregated team of black female mathematicians who worked on largely by-hand computations at Langley Memorial Aeronautical Laboratory during the mid-20th century.

Shortly after the book appeared, Fox 2000 released a movie version of *Hidden Figures* with an all-star cast. Last summer I chatted with Shetterly and Fox 2000 president Elizabeth Gabler about their roles in bringing this intriguing story to light.

Shetterly's and Gabler's comments have been edited for clarity.

An Unlikely Author

Given that Shetterly had never written a book before and was not a STEM (science, technology, engineering, and mathematics) professional, I wondered what led



Aran Shetterly

Margot Lee Shetterly.

her to write a book about a story that was so complex in both its content (mathematics, aeronautics, and space flight) and setting (the time leading up to and during the civil rights movement).

She pointed out that she grew up in Hampton, Virginia, home to Langley, where she had visited her father, an internationally recognized climate scientist, many times. And she knew some of the women she

would later write about as residents of her hometown.

In the foreword, Shetterly writes, "Growing up in Hampton, the face of science was brown like mine. . . . I knew so many African-Americans working in science, math, and engineering that I thought that's just what black folks did. . . . I thought these stories were normal. It was my husband's reaction to hearing this story for the first time that helped me see it with fresh eyes and realize that it is unusual and interesting. . . . [It] spurred me to explore the story and learn more."

Shetterly began by talking to her former Sunday school teacher, Katherine G. Johnson, the NASA mathematician who worked on problems associated with getting NASA's astronauts into space. She told me that from there, "it got more and more interesting. I found out that there were so many women involved. Everyone



NASA

Human computers (left to right) Dorothy Vaughan, Leslie Hunter, and Vivian Adair.

I told the story to was surprised that they had never heard of it.” She began to realize that the black women mathematicians at Langley were truly hidden figures. Given these reactions, she thought it was important to bring their story to a larger audience.

Shaping the Story

The full story has multiple layers. There are many characters, the historical context is essential to understanding the women and their accomplishments, and the technical aspects are multitudinous—the math, the aeronautics, the problems of space flight, and more. One of the hurdles for Shetterly was “figuring out how to pull together the book with so many different pieces and parts into a narrative. My challenge was to decide how much context to provide versus how many personal stories of the women to tell.”

But the research for the book “happened organically. I started by talking with Katherine Johnson, who was closest to the astronauts. People have been writing about Katherine since the 1960s.” Although Johnson’s story is an impressive one, Shetterly realized that “this is not a story about one woman.”

In their conversations, Johnson told Shetterly about Dorothy Vaughan, a woman who started out, like many of the others, as a high school mathematics teacher before landing the position at Langley. She eventually rose to the position of supervisor of the West Computers. Shetterly recognized that Vaughan was the real focal point for the story. “From Dorothy, everyone else branched off.” Through her long tenure at Langley and

her personal life, Vaughan touched and interacted with all the other women in the book in some way.

Unfortunately, Shetterly was unable to interview Vaughan, who had died in 2008. I asked if there were other people she wasn’t able to interview. She said, “A lot of the people have passed away or are passing away. I did not get to interview the two engineers Katherine Johnson worked closely with, since they passed away early in the interview process.” As for the women of West Computers, “There were a lot of computers left, but they were in their 80s and 90s.”

Shetterly benefitted from the records kept at NACA and NASA. Also invaluable were the interviews conducted as part of an oral history program at the Johnson Space Center and maintained at NASA Langley by the historian Mary Gainor.

“Mary Gainor has been a superhero,” Shetterly said. “She interviewed people and built a website. As resources have dwindled, she has done everything she can to help preserve the history, artifacts, and interviews.”

Making the Tech Accessible

In this book about mathematicians in the aeronautics industry, Shetterly does an outstanding job of explaining the technical concepts in an authentic, yet accessible fashion—an impressive feat for someone who is not trained in a STEM field.

She admitted that the science drew her in. “All of the World War II history, the wind tunnels—I saw those many times as a child—I wondered, how does it work? I wanted to learn more about the aeronautics industry.” But she acknowledged, “It took a lot of work to read these [NACA and NASA] reports. That’s why it took so long for the research. My goal was to understand enough of what they did and the concepts behind it so that I could explain it clearly.”

Shetterly said that “early drafts had a lot more technical information. It was hard to have enough technical information with sufficient detail for credibility,” yet not so much as to lose the average reader. Eventually, she decided she would make extensive use of footnotes with links to the actual reports, together with shorter, less jargon-filled synopses. Ultimately, she “tried to strike a balance and present it through the eyes of the women.”

The Social Context

The book is not all rockets and math; it has a heavy focus on the era’s social context. The story takes place before and during the civil rights movement, and Shetterly



NASA

Katherine Johnson.

says we can learn from this history.

“Even during the days of segregation, these women were persevering and doing critically important mathematical research.” Shetterly felt she had to “pull the curtain back on history and show these women doing this work . . . a lot of which happened as a government scientific program. This story provides insight on how to get more women and minorities in STEM” and “the role of the workforce in economic development,” which she observed was powered by aeronautics in the mid-20th century.

However, “when electronic computers came on board,” and the cost of computing machines skyrocketed, “they moved the women out the door with the desktop calculating machines.” When computers became viewed as more than office machines, computing became men’s work.

She attributes some of our gender and racial biases to cultural blind spots. “We assume this person couldn’t be good at math, when we may be overlooking supreme talent. I hope people are open to understanding that people who look different aren’t really.” Moreover, she said, “you can’t say women weren’t interested in computing. History shows us that this is not true.

“A lot of this story is hard and dispiriting, but fascinating even when it’s really hard. The American hopefulness and spirit and wanting to be better and to live up to these ideals is something that can help right now.” It is Shetterly’s hope that the story in *Hidden Figures* will help us “take off the blinders of modern life a little bit . . . and unite over science and math.” ■

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A Hollywood Treatment

I spoke with Fox 2000 president Elizabeth Gabler, producer of films such as *The Devil Wears Prada*, *Walk the Line*, and *Alvin and the Chipmunks*, about the making of the movie version of *Hidden Figures*.

The Movie’s Story

The book spans more than 30 years, including World War II, the abrupt transition to the post-WWII era, and the early successes of NASA in the space age. It

is also a complex story with many intertwining threads involving the women’s personal lives amid the turbulent civil rights landscape. With so many angles from which to tell this story, I asked Gabler what they chose to focus on.

Gabler said they decided to show the lives of Vaughan (played by Octavia Spencer), Johnson (Taraji P. Henson), and NASA engineer Mary Jackson (Janelle Monáe) and their contributions to the space race against the Soviets. Gabler added that you see “all three women and their personal lives separately and together at NASA and the different roles they each had at [NASA] Langley.” She acknowledged that the civil rights story is featured less prominently than in the book.

Where’s the Math?

I asked Gabler what attracted her to the story. She replied, “It is a story about an extraordinary part of our history that very few people know about. This incredibly inspirational story encourages people of all ages to reach for their dreams and not let obstacles get in their way.”

Given its focus on the space race, I was curious as to how the movie handles the technical aspects of the story. Gabler admitted that “the film is math light,” although the producers did enlist both NASA and IBM to





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Katherine G. Johnson (Taraji P. Henson), flanked by fellow mathematicians Dorothy Vaughan (Octavia Spencer) and Mary Jackson (Janelle Monáe) meet the man they helped send into orbit, John Glenn (Glen Powell).

help ensure the accuracy of the portrayals in the movie.

Gabler said that the actors memorized some of the equations and attempted a “working knowledge of the math,” with Henson responsible for more math than the other actors. “We don’t want the math to be over people’s heads or the movie to be like a math class, so it’s accessible and about the people.”

Inspiration

When I asked if the producers might have plans to use the movie to encourage kids to follow their STEM passions, Gabler replied that their aim was “to put something out there that [young people] are interested in—like Pharrell and Janelle.”

Pharrell Williams, whom she called a “force of nature as a musician and a person, grew up near where the story took place.” He and his producing partner wrote some original music for the score, and Williams contributed to other creative aspects of film as one of the producing partners.

Janelle Monáe, who is best known as a Grammy-nominated musician, does double duty starring in the film and performing music for the soundtrack.

Gabler hopes “the music will reach out to younger au-

diences. Then they will see the movie and it will inspire them.”

Shetterly on the Film

Fox optioned the book very early in the writing process. Shetterly said that this resulted in “the strange and unusual experience of working with [the producers] as the book was being written.”

At the time of our conversation, she had not seen the final movie cut. She confessed, “I am really excited, but I have mixed feelings. In the book, you can tell the whole story and add the details and research notes. But lots more folks see movies than read books, so it helps the story get out there in a big way.

“It was interesting to see the story spanning over 30 years whittled down to a movie narrative.” She called the whole experience “incredible.” ■

—J. Carpenter