

Space Conquest: The Need for Women in Stem – TEXT A -

While telling the story of three unknown space Hidden Figures also reveals a greater truth about NASA. There's a moment halfway into Hidden Figures when head NASA engineer Paul Stafford refuses the request of Katherine Johnson to attend an **editorial meeting** about John Glenn's upcoming mission to become the first American to orbit the Earth. Stafford's response is dismissive—"There's no protocol for women attending." Johnson replies, "There's no protocol for a man circling Earth either, sir." The quote underlines this based-on-a-true-story movie. For NASA to get John Glenn into space and home safely, institutions that supported prejudices and biases needed to start **tumbling down**. All hands (and brains) had to be **on deck**.

Adapted from Margot Lee Shetterly's book Hidden Figures: The American Dream and the Untold Story of the Black Women Mathematicians Who Helped Win the Space Race, the film focuses on three real-life African-American female pioneers: Katherine Johnson, Dorothy Vaughan, and Mary Jackson, who were part of NASA's team of human "computers." This was a group made up of mostly women who calculated by hand the complex equations that allowed space heroes like Neil Armstrong, Alan Shepard, and Glenn to travel safely to space. Through sheer tenacity, force of will, and intellect, they ensured their stamp on American history—even if their story has remained obscured from public view until now.

Women working as so-called "human computers" dates back decades before space exploration. In the late 19th century, the Harvard College Observatory employed a group of women who collected, studied, and cataloged thousands of images of stars on glass plates. As chronicled in Dava Sobel's book The Glass Universe, these women were every bit as capable as men despite working under less-than-favorable conditions. Williamina Fleming, for instance, classified over 10,000 stars using a scheme she created and was the first to recognize the existence of **white dwarfs**. While working six-day weeks at a job demanding "a large capacity for **tedium**," they were still expected to uphold societal norms of being a good wife and mother.

In 1935, the NACA (National Advisory Committee for Aeronautics, which will become NASA) hired five women to be their first "computers". "The women were meticulous and accurate... and they didn't have to pay them very much," NASA's historian Bill Barry says, explaining the NACA's decision. In June 1941, with war raging in Europe, President Franklin Roosevelt needed more federal workforce. He issued Executive Order 8802, which banned "discrimination in the employment of workers in defense industries or government because of race, creed, color, or national origin" (though it does not include gender). Six months later, NACA and Langley began recruiting African-American women with college degrees to work as human computers.

While they did the same work as their white counterparts, African-American computers were paid less and relegated to the segregated west section of the Langley campus, where they had to use separate dining and bathroom facilities. They became known as the "West Computers." Despite having the same education, they had to retake college courses they had already passed and were often never considered for promotions or other jobs within NACA. Hidden Figures depicts this in a scene in which "computer" Mary Jackson is asked if she's want to be an engineer if she were a white man. Jackson responds, "I wouldn't have too. I would already be one."(...)

The film primarily focuses on John Glenn's 1962 trip around the globe and most of the events in the movie are historically accurate. Johnson's main job in the lead-up and during the mission was to double-check and reverse engineer the newly-installed IBM 7090s trajectory calculations. As it shows, there were very tense moments during the flight that forced the mission to end earlier than expected. And John Glenn did request that Johnson specifically check and confirm trajectories and entry points that the IBM spat out. As Shetterly wrote in her book and explained in a September NPR interview, Glenn did not completely trust the computer. So, he asked the head engineers to "get the girl to check the numbers... If she says the numbers are good... I'm ready to go."

Matt Blitz, "The True Story of 'Hidden Figures' and the Women Who Crunched the Numbers for NASA", *popularmechanics.com*, Feb 3, 2017

editorial meeting : *réunion éditoriale* - **tumbling down** : *dégringoler* - **on deck** : *sur le pont, ici: être prêt à*
white dwarfs : *naine blanche* (objet céleste de forte densité) - **tedium**: *ennui*