

SPOTLIGHT ON STEM



WEST AREA COMPUTERS

(1943 - 1958)



When Computers Wore Skirts

BACKGROUND

- ◉ Before electronic computers, the term “computers” referred to people instead of machines.
- ◉ A human computer performed complex mathematical calculations by hand, either individually or in groups called computer pools. The increased need for computer pools was due mostly to the preparation for World War II which led to large-scale scientific and military research.
- ◉ In 1915 the National Advisory Committee on Aeronautics (NACA, the predecessor to NASA) was formed to coordinate industry, academic, and government research on war-related projects during World War I.
- ◉ Langley Memorial Aeronautical Laboratory in Virginia, the main research arm of NACA, started hiring computers in the 1930s.

BACKGROUND

- ◉ The computers of this time were white women with degrees in mathematics. Due to racial segregation in government, universities, and general society, there were very few opportunities for African American women to obtain employment in federal defense industries or pursue the sciences.
- ◉ Executive Order 8802 was signed by President Franklin D. Roosevelt on June 25, 1941, to prohibit racial discrimination in the national defense industry.
- ◉ In 1943 NASA Langley Research Center starts to hire African American women as computers. Segregation continued even at NASA and they were restricted to the West Area of the Langley facility, hence the name West Area Computers.

KATHERINE JOHNSON

- ◉ A physicist, space scientist, and mathematician, she is known for accuracy in computerized celestial navigation.
- ◉ 1959 - calculated the trajectory for the space flight of Alan Shepard, the first American in space.
- ◉ 1961 - calculated the Mercury mission launch window.
- ◉ 1962 - when NASA used electronic computers for the first time to calculate John Glenn's orbit around Earth, officials called on her to verify the computer's numbers because Glenn asked for her personally and refused to fly unless Katherine verified the calculations.
- ◉ 1969 - calculated the trajectory for the 1969 Apollo 11 flight to the Moon.
- ◉ 1970 - Johnson worked on Apollo 13's mission to the Moon. When the mission was aborted, Johnson's work on backup procedures and charts helped safely return the crew to Earth four days later.

KATHERINE JOHNSON

- ◉ 2016 Astronomical Society of the Pacific's Arthur B.C. Walker II Award
- ◉ 2015 received the Presidential Medal of Freedom
- ◉ 2015 NCWIT Pioneer in Tech Award
- ◉ 1971, 1980, 1984, 1985, 1986 NASA Langley Research Center Special Achievement award
- ◉ 1967, Apollo Group Achievement Award
- ◉ 1967, NASA Lunar Orbiter Spacecraft and Operations team award
- ◉ August 26, 1918 (age 98). Her birthday is Women's Equality Day.



CHRISTINE DARDEN



- ◉ An American mathematician, data analyst, and aeronautical engineer who devoted her 40-year career in aerodynamics to researching sonic booms at NASA.
- ◉ Dr. Christine Darden was one of the West Area Computers.
- ◉ Before the group was disbanded, Darden moved up the ranks to become "one of NASA's preeminent experts on supersonic flight and sonic booms, as well as the first African-American woman at Langley to be promoted into senior executive service.
- ◉ In 1989, Darden was appointed leader of the Sonic Boom Team, a subsidiary of the High Speed Research (HSR) Program. On the Sonic Boom Team she worked to decrease the negative effects of sonic booms such as noise pollution and the depletion of the ozone layer. Her team tested new wing and nose designs for supersonic aircraft. She also designed a computer program to simulate sonic booms.
- ◉ September 10, 1942 (age 74)

DOROTHY VAUGHN



- ◉ Dorothy Vaughn worked at the center from 1943 - 1971
- ◉ Vaughn did computer programming, becoming proficient in coding languages such as FORTRAN, and also contributed to the space program through her work on the Scout Project.
- ◉ In 1949, Vaughn became the acting head of the West Area Computers. It would take two more years until she would be officially appointed the title of section head, in January 1951.
- ◉ Vaughn continued at Langley after NACA became NASA, specializing for the rest of her career in electronic computing and FORTRAN programming. She worked in the Langley Research Center's Analysis and Computation Division, and also participated in Scout Project (Solid Controlled Orbital Utility Test system) tests at Wallops Flight Facility.
- ◉ Sept 20, 1910 - Nov 10, 2008 (aged 98)

MARY JACKSON

- ◉ 1951 - she began her career as a research mathematician, or computer, at the Langley Research Center in her hometown of Hampton, Virginia.
- ◉ 1953 - she moved to the Compressibility Research Division. After five years at NASA and after taking several additional courses, she joined a special training program and was promoted to aerospace engineer.
- ◉ She then worked to analyze data from wind tunnel experiments and real-world aircraft flight experiments at the Theoretical Aerodynamics Branch of the Subsonic-Transonic Aerodynamics Division at Langley.
- ◉ Her goal was to understand air flow, including thrust and drag forces. Many years later, she was assigned to work with the flight engineers at NASA.
- ◉ April 9, 1921 - February 11, 2005 (aged 83)





HALF OF NASA'S NEWEST ASTRONAUT CLASS ARE WOMEN

By Danny Lewis, Smithsonian.com

KATHERINE JOHNSON QUOTES

When asked “What good does it do you to go to outer space?” Katherine Johnson responded “What good does it do you to stay home?”

“You learn if you want to so you’ve got to want to learn.”

“You need to learn how to learn.”

“If you lose your curiosity you stop learning.”