

Katherine Johnson

Contributed to the first lunar landing

1918 - TODAY

Biography

- ▶ Born on August 26th, 1918 in West-Virginia as Katherine Coleman, youngest of four children
- ▶ Her mother was a teacher and her father was a farmer who also worked as a caretaker
- ▶ Developed very early an interest in numbers and mathematics
- ▶ Started directly with the second year when enrolled in school and jumped another school year later on
- ▶ Thus, started high school with 10 and graduated it with 14
- ▶ As in her hometown school for African-American stopped at eighth grade, her father drove her and her sisters 120 miles to another city offering higher education for them
- ▶ Received a scholarship for the West Virginia College
- ▶ In 1937, graduated with a Bachelor of Science in French and Mathematics
- ▶ After graduation, she worked as a teacher
- ▶ First marriage in 1939 with James Francis Goble with whom she gave birth to three daughters
- ▶ Started her NASA career in 1953 as a *computer*
- ▶ There, she first calculated the results of wind tunnel tests
- ▶ Later, she was "borrowed" to the aerospace research department, but they never "gave her back" because they welcomed her good knowledge of analytic geometry
- ▶ Her husband died of brain cancer in 1956
- ▶ In 1959, she married James A. Johnson
- ▶ Retired in 1986
- ▶ Received the Presidential Medal of Freedom in 2015

Contributions

- ▶ Theoretical foundations for the first manned airspace programs of NASA
- ▶ Contributed to the Mercury-Redstone 3 mission in 1961 and the Mercury-Atlas 6 mission in 1962 where astronaut John Glenn asked her to verify the calculations made by a computer because he trusted her more
- ▶ Calculated the correct orbit trajectory for the Apollo 11 mission and hence contributed to the first moon landing
- ▶ Even after retirement, continued to collaborate with universities and high schools in order to encourage students to start studying science
- ▶ The only woman who made it as a *computer* to another department
- ▶ The first woman who contributed to a scientific paper of her department

Honors

- ▶ Presidential Medal of Freedom in 2015 from President Barack Obama - the highest civil honor in the US
- ▶ NASA Langley Research Center Special Achievement award in 1971, 1980, 1984, 1985 and 1986
- ▶ Several honorary doctorates
- ▶ The film *Hidden Figures* from 2016, based on a book by Margot Lee Shetterly, directed by Theodore Melfi tells the story of Johnson and other black female mathematicians who worked at the NASA during the Space Race

Quotations

- ▶ Johnson about her early fascination: *I counted everything. I counted the steps to the road, the steps up to church, the number of dishes and silverware I washed, ... anything that could be counted, I did.*
- ▶ Johnson about her feeling regarding equality: *My dad taught us 'you are as good as anybody in this town, but you're not better.'*
- ▶ Johnson about her beginning at NASA: *We wrote our own textbook, because there was no other text about space. We just started from what we knew.*
- ▶ Johnson about her work: *This was what a research mathematician did. I went to work every day for 33 years happy. Never did I get up and say I don't want to go to work.*

NASA Mission Apollo 11

- ▶ First manned lunar landing
- ▶ National goal set by President John F. Kennedy in 1961
- ▶ Launch on July 16th, 1969
- ▶ Landing on July 24th, 1969
- ▶ Crew: Neil Amstrong, Edwin Aldrin and Michael Collins
- ▶ Famous quote: *... one small step for a man, one giant leap for mankind.*
- ▶ Around 530 million people watched Amstrong's televised image



Figure 1: Apollo 11 mission patch

Portrait



Figure 2: Katherine Johnson

Afro-American Women in the NASA

- ▶ Due to segregation, the black and white skinned *computers* had separate offices
- ▶ They even had to eat and use restrooms that were separate from those of their white colleagues
- ▶ Johnson called them the *computers who wore skirts*
- ▶ Even today, less than 1 percent of doctorates in math in the US are awarded to African-Americans

References

1. https://en.wikipedia.org/wiki/Katherine_Johnson
2. <https://www.nasa.gov/langley/katherine-johnson>
3. https://www.nasa.gov/mission_pages/apollo/missions/index.html
4. <https://www.nytimes.com/2019/02/18/us/edray-goins-black-mathematicians.html>