

## What is Hidden Has Been Revealed

14<sup>th</sup> Sunday in Ordinary Time

July 9, 2017

It was April 12, 1961. Yuri Gagarin, a Russian became the first person in space when he orbited the earth. This put the United States behind the eight ball in the space race. A month later Alan Sheperd became the first American in space on a short mission. But to orbit the earth required math to be developed to calculate the trajectory on takeoff and the re-entry point. The equations had not yet been developed. They were hidden. Further any miscalculation would cause the spacecraft to burn up from too fast of a re-entry or go off into outer space forever. Since this was in the days when BM computers were just emerging all calculations were performed painstakingly by hand using teams of human computers working on the immense problem. One of them was Catherine Johnson, a brilliant black woman, who was key in the development of the math required. Within 10 months after the Russian success John Glen was put into space on February 20, 1962 orbiting the earth three times. The math, verified by Catherine at the request of John Glen, proved to be perfect. A mere seven years later on July 20, 1969 Neil Armstrong was the first person to walk on the moon.

***It is amazing what can happen when what has been hidden becomes known. We know of many instances in our own lives when we have an aha moment when something we seek becomes visible. We are changed forever. We can understand, accomplish, dream of something that we may not have even imagined before. It opens whole new doors for us. We need to be open to the revelation when it comes or we will miss it.***

***Throughout the ages down to today people have been seeking and are seeking the divine, the mysteries of God, to understand salvation, to know our purpose on earth, to have answers to the difficult questions of life. Many of those remain hidden to us or are revealed slowly. In the Gospel today Jesus is speaking to God, his Father. He notes that what was hidden has been revealed to the little ones, in other words to the childlike. **Children are so trusting, so open to new ideas, so vulnerable. And that is the attitude necessary to have God revealed to us.** It may remain hidden for the wise and learned. **And when it is revealed through Jesus it makes all of the difference in the world. It will put a spring in our step, a vibrancy in our lives. Our faith may make more sense, our lives may come*****

***together in new ways, we may have a brief glimpse into the mystery of God, a passage of scripture may take on new meaning or maybe an insight into the difficult questions of life.*** We merely need to seek having that trusting attitude, being open to the Spirit and being vulnerable in the presence of our God. Perhaps it will come from reflecting on the Word you heard today, the Eucharist we will celebrate in a few moments as the Body of Christ, our prayers of intercession, the faith filled conversations that we will have with others, a spiritual dream you will have tonight. Jesus goes on further to say that the Father will be revealed to anyone whom the Son wishes. We can be assured that Jesus does wish to give us, as baptized Christians, life and life abundantly.

***Just like the United States found itself behind in the space race we may be behind in seeking spiritual revelation. Seek and ye shall find. Knock and the door shall be opened unto you. We need the equivalent of a new trajectory and orbit in our spiritual realm. We pray that we will have that trusting attitude, that openness to the Spirit, the vulnerability to seek and recognize the revelation when it comes. All things are possible with God.***

### **Reading 1ZEC 9:9-10**

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Thus says the LORD:  
Rejoice heartily, O daughter Zion,  
shout for joy, O daughter Jerusalem!  
See, your king shall come to you;  
a just savior is he,  
meek, and riding on an ass,  
on a colt, the foal of an ass.  
He shall banish the chariot from Ephraim,  
and the horse from Jerusalem;  
the warrior's bow shall be banished,  
and he shall proclaim peace to the nations.  
His dominion shall be from sea to sea,  
and from the River to the ends of the earth.

### **Responsorial PsalmPS 145:1-2, 8-9, 10-11, 13-14**

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R. (cf. 1) **I will praise your name for ever, my king and my God.**

or:

R. **Alleluia.**

I will extol you, O my God and King,  
and I will bless your name forever and ever.  
Every day will I bless you,  
and I will praise your name forever and ever.

R. **I will praise your name for ever, my king and my God.**

or:

R. **Alleluia.**

The LORD is gracious and merciful,  
slow to anger and of great kindness.  
The LORD is good to all  
and compassionate toward all his works.

R. **I will praise your name for ever, my king and my God.**

or:

R. **Alleluia.**

Let all your works give you thanks, O LORD,  
and let your faithful ones bless you.  
Let them discourse of the glory of your kingdom  
and speak of your might.

R. **I will praise your name for ever, my king and my God.**

or:

R. **Alleluia.**

The LORD is faithful in all his words  
and holy in all his works.

The LORD lifts up all who are falling  
and raises up all who are bowed down.

R. **I will praise your name for ever, my king and my God.**

or:

R. **Alleluia.**

### **Reading 2ROM 8:9, 11-13**

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Brothers and sisters:  
You are not in the flesh;  
on the contrary, you are in the spirit,

if only the Spirit of God dwells in you.  
Whoever does not have the Spirit of Christ does not belong to him.  
If the Spirit of the one who raised Jesus from the dead dwells in you,  
the one who raised Christ from the dead  
will give life to your mortal bodies also,  
through his Spirit that dwells in you.  
Consequently, brothers and sisters,  
we are not debtors to the flesh,  
to live according to the flesh.  
For if you live according to the flesh, you will die,  
but if by the Spirit you put to death the [deeds](#) of the body,  
you will live.

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**Alleluia** **CF. MT 11:25**

**R. Alleluia, alleluia.**  
Blessed are you, Father, Lord of heaven and earth;  
you have revealed to little ones the mysteries of the kingdom.  
**R. Alleluia, alleluia.**

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**Gospel** **MT 11:25-30**

At that time Jesus exclaimed:  
"I give praise to you, Father, Lord of heaven and earth,  
for although you have hidden these things  
from the wise and the learned  
you have revealed them to little ones.  
Yes, Father, such has been your gracious will.  
All things have been handed over to me by my Father.  
No one knows the Son except the Father,  
and no one knows the Father except the Son  
and anyone to whom the Son wishes to reveal him."

"Come to me, all you who labor and are burdened,  
and I will give you rest.  
Take my yoke upon you and learn from me,  
for I am meek and humble of heart;  
and you will [find rest](#) for yourselves.  
For my yoke is easy, and my burden light."

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.

**John Herschel Glenn Jr.** (July 18, 1921 – December 8, 2016) was a [United States Marine Corps aviator](#), [engineer](#), [astronaut](#), and [United States Senator](#) from [Ohio](#). In 1962 he was the first American to orbit the Earth, circling it three times. Before joining [NASA](#), Glenn was a distinguished [fighter pilot](#) in [World War II](#) and [Korea](#) with six [Distinguished Flying Crosses](#) and eighteen [Air Medals](#).

He was one of the [Mercury Seven](#), military [test pilots](#) selected in 1959 by NASA as the United States' first astronauts. On February 20, 1962, Glenn flew the [Friendship 7](#) mission; the first American to orbit the Earth, he was the fifth person in space. He received the [NASA Distinguished Service Medal](#), the [Congressional Space Medal of Honor](#) in 1978, was inducted into the [U.S. Astronaut Hall of Fame](#) in 1990, and was the last surviving member of the Mercury Seven.

## 1960s - Manned Space Flight

Soviet cosmonaut Yuri Gagarin became the first person in space when he orbited the Earth in a Vostok spacecraft on **April 12, 1961**. About a month later Alan Shepard, Jr. became the first American in space on **May 5, 1961**, when he was launched aboard Mercury-Redstone 3.

Lewis helps perfect the use of liquid hydrogen rocket fuel and makes major contributions to the Mercury and Apollo programs.

1960 - Mercury Astronauts train at Lewis' Multiple Axis Space Test Inertia Facility (MASTIF) to learn how to control tumbling spacecraft. The Mercury astronauts, such as Ohio's own John Glenn trained there.

1961 - Abe Silverstein named Center Director. Electric Propulsion Laboratory completed.

1962 - On February 20, Ohio astronaut John Glenn orbits the Earth in Friendship 7 launched by an Atlas-6 rocket. Glenn, the first of Ohio's astronauts, was the first American to orbit Earth.

1962 - Centaur and Agena programs transferred to Lewis. These upper-stage boosters are to be used to launch planetary and lunar probes, and they're paving the way for a manned flight to the moon. The Nuclear Research Reactor Facility begins operating.

1963 - Lewis manages first successful launch of Centaur rocket (AC-2) on November 27. NASA acquires Plum Brook Station from the Army.

1964 - Space Electric Rocket Test (SERT) proves electron-bombardment ion thruster design.

1966 - Zero Gravity Facility completed.

1969 - On July 20, Apollo 11 lands first man on the moon; at the controls is Ohio astronaut Neil

Armstrong. NASA Lewis takes pride in its contributions. Bruce T. Lundin is named Center Director. And the Space Power Facility is completed.

## Katherine Johnson Biography



Portrait of Katherine Johnson  
*Credits: NASA*

Date of Birth: August 26, 1918

Hometown: White Sulphur Springs, WV

Education: B.S., Mathematics and French, West Virginia State College, 1937

Hired by NACA: June 1953

Retired from NASA: 1986

Actress Playing Role in Hidden Figures: Taraji P. Henson

**Being handpicked to be one of three black students to integrate West Virginia's graduate schools is something that many people would consider one of their life's most notable moments, but it's just one of several breakthroughs that have marked Katherine Johnson's long and remarkable life.** Born in White Sulphur Springs, West Virginia in 1918, Katherine Johnson's intense curiosity and brilliance with numbers vaulted

her ahead several grades in school. By thirteen, she was attending the high school on the campus of historically black West Virginia State College. At eighteen, she enrolled in the college itself, where she made quick work of the school's math curriculum and found a mentor in math professor W. W. Schieffelin Claytor, the third African American to earn a PhD in Mathematics. Katherine graduated with highest honors in 1937 and took a job teaching at a black public school in Virginia.

When West Virginia decided to quietly integrate its graduate schools in 1939, West Virginia State's president Dr. John W. Davis selected Katherine and two male students as the first black students to be offered spots at the state's flagship school, West Virginia University. Katherine left her teaching job, and enrolled in the graduate math program. At the end of the first session, however, she decided to leave school to start a family with her husband. She returned to teaching when her three daughters got older, but it wasn't until 1952 that a relative told her about open positions at the all-black West Area Computing section at the National Advisory Committee for Aeronautics' (NACA's) Langley laboratory, headed by fellow West Virginian Dorothy Vaughan. Katherine and her husband, James Goble, decided to move the family to Newport News to pursue the opportunity, and Katherine began work at Langley in the summer of 1953. Just two weeks into Katherine's tenure in the office, Dorothy Vaughan assigned her to a project in the Maneuver Loads Branch of the Flight Research Division, and Katherine's temporary position soon became permanent. She spent the next four years analyzing data from flight test, and worked on the investigation of a plane crash caused by wake turbulence. As she was wrapping up this work her husband died of cancer in December 1956.

The 1957 launch of the Soviet satellite Sputnik changed history—and Katherine Johnson's life. In 1957, Katherine provided some of the math for the 1958 document [Notes on Space Technology](#), a compendium of a series of 1958 lectures given by engineers in the Flight Research Division and the Pilotless Aircraft Research Division (PARAD). Engineers from those groups formed the core of the Space Task Group, the NACA's first official foray into space travel, and Katherine, who had worked with many of them since coming to Langley, "came along with the program" as the NACA became NASA later that year. She did trajectory analysis for Alan Shepard's [May 1961 mission Freedom 7](#), America's first human spaceflight. In 1960, she and engineer Ted Skopinski coauthored [Determination of Azimuth Angle at Burnout for Placing a Satellite Over a Selected Earth Position](#), a report laying out the equations describing an orbital spaceflight in which the landing position of the spacecraft is specified. It was the first time a woman in the Flight Research Division had received credit as an author of a research report.

In 1962, as NASA prepared for the orbital mission of John Glenn, Katherine Johnson was called upon to do the work that she would become most known for. The complexity of the orbital flight had required the construction of a worldwide communications network, linking tracking stations around the world to IBM computers in Washington, DC, Cape Canaveral, and Bermuda. The computers had been programmed with the orbital equations that would control the trajectory of the capsule in Glenn's Friendship 7 mission, from blast off to splashdown, but the astronauts were wary of putting their lives in the care of the electronic calculating machines, which were prone to hiccups and blackouts. As a part of the preflight checklist, Glenn asked engineers to "get the girl"—Katherine Johnson—to run the

same numbers through the same equations that had been programmed into the computer, but by hand, on her desktop mechanical calculating machine. **“If she says they’re good,” Katherine Johnson remembers the astronaut saying, “then I’m ready to go.” Glenn’s flight was a success, and marked a turning point in the competition between the United States and the Soviet Union in space.**

When asked to name her greatest contribution to space exploration, Katherine **Johnson talks about the calculations that helped synch Project Apollo’s Lunar Lander with the moon-orbiting Command and Service Module.** She also worked on the Space Shuttle and the Earth Resources Satellite, and authored or coauthored 26 research reports. She retired in 1986, after thirty-three years at Langley. “I loved going to work every single day,” she says. In 2015, at age 97, Katherine Johnson added another extraordinary achievement to her long list: President Obama awarded her the Presidential Medal of Freedom, America’s highest civilian honor.

# Dorothy Vaughan Biography



Portrait of Dorothy Vaughan  
*Credits: Courtesy Vaughan Family*

Date of Birth: September 20, 1910

Hometown: Kansas City, MO

Education: B.A., Mathematics, Wilberforce University, 1929

Hired by NACA: December 1943

Retired from NASA: 1971

Date of Death: November 10, 2008

Actress Playing Role in Hidden Figures: Octavia Spencer

In an era when NASA is led by an African American man (Administrator Charles Bolden) and a woman (Deputy Administrator Dava Newman), and when recent NASA Center Directors come from a variety of backgrounds, it's easy to overlook the people who paved the way for the agency's current robust and diverse workforce and leadership. Those who

speak of NASA's pioneers rarely mention the name Dorothy Vaughan, but as the head of the National Advisory Committee for Aeronautics' (NACA's) segregated West Area Computing Unit from 1949 until 1958, Vaughan was both a respected mathematician and NASA's first African-American manager.

Dorothy Vaughan came to the Langley Memorial Aeronautical Laboratory in 1943, during the height of World War II, leaving her position as the math teacher at Robert Russa Moton High School in Farmville, VA to take what she believed would be a temporary war job. Two years after President Roosevelt signed Executive Order 8802 into law, prohibiting racial, religious and ethnic discrimination in the country's defense industry, the Laboratory began hiring black women to meet the skyrocketing demand for processing aeronautical research data. Urgency and twenty-four hour shifts prevailed-- as did Jim Crow laws which required newly-hired "colored" mathematicians to work separately from their white female counterparts. Dorothy Vaughan was assigned to the segregated "West Area Computing" unit, an all-black group of female mathematicians, who were originally required to use separate dining and bathroom facilities. Over time, both individually and as a group, the West Computers distinguished themselves with contributions to virtually every area of research at Langley.

The group's original section heads (first Margery Hannah, then Blanche Sponsler) were white. In 1949, Dorothy Vaughan was promoted to lead the group, making her the NACA's first black supervisor, and one of the NACA's few female supervisors. The Section Head title gave Dorothy rare Laboratory-wide visibility, and she collaborated with other well-known (white) computers like Vera Huckel and Sara Bullock on projects such as compiling a handbook for algebraic methods for calculating machines. Vaughan was a steadfast advocate for the women of West Computing, and even intervened on behalf of white computers in other groups who deserved promotions or pay raises. Engineers valued her recommendations as to the best "girls" for a particular project, and for challenging assignments they often requested that she personally handle the work.

Dorothy Vaughan helmed West Computing for nearly a decade. In 1958, when the NACA made the transition to NASA, segregated facilities, including the West Computing office, were abolished. Dorothy Vaughan and many of the former West Computers joined the new Analysis and Computation Division (ACD), a racially and gender-integrated group on the frontier of electronic computing. Dorothy Vaughan became an expert FORTRAN programmer, and she also contributed to the Scout Launch Vehicle Program.

Dorothy Vaughan retired from NASA in 1971. She sought, but never received, another management position at Langley. Her legacy lives on in the successful careers of notable West Computing alumni, including Mary Jackson, Katherine Johnson, Eunice Smith and Kathryn Peddrew, and the achievements of second-generation mathematicians and engineers such as Dr. Christine Darden.

# Mary Jackson Biography



Mary Jackson grew up in Hampton, Virginia. After graduating with highest honors from high school, she then continued her education at Hampton Institute, earning her Bachelor of Science Degrees in Mathematics and Physical Science. Following graduation, Mary taught in Maryland prior to joining NASA. Mary retired from the NASA Langley Research Center in 1985 as an Aeronautical Engineer after 34 years.

*Credits: NASA*

Date of Birth: April 9, 1921

Hometown: Hampton, VA

Education: B.S., Mathematics and Physical Science, Hampton Institute, 1942

Hired by NACA: April 1951

Retired from NASA: 1985

Date of Death: February 11, 2005

Actress Playing Role in Hidden Figures: Janelle Monáe

For Mary Winston Jackson, a love of science and a commitment to improving the lives of the people around her were one and the same. In the 1970s, she helped the youngsters in the science club at Hampton's King Street Community center build their own wind tunnel and use it to conduct experiments. "We have to do something like this to get them interested in science," she said in an article for the local newspaper. "Sometimes they are not aware of the number of black scientists, and don't even know of the career opportunities until it is too late."

Mary's own path to an engineering career at the NASA Langley Research Center was far from direct. A native of Hampton, Virginia, she graduated from Hampton Institute in 1942 with a dual degree in Math and Physical Sciences, and accepted a job as a math teacher at a black school in Calvert County, Maryland. Hampton had become one of the nerve centers of the World War II home front effort, and after a year of teaching, Mary returned home, finding a position as the receptionist at the King Street USO Club, which served the city's black population. It would take three more career changes—a post as a bookkeeper in Hampton Institute's Health Department, a stint at home following the birth of her son, Levi, and a job as an Army secretary at Fort Monroe—before Mary landed at the Langley Memorial Aeronautical Laboratory's segregated West Area Computing section in 1951, reporting to the group's supervisor Dorothy Vaughan.

After two years in the computing pool, Mary Jackson received an offer to work for engineer Kazimierz Czarnecki in the 4-foot by 4-foot Supersonic Pressure Tunnel, a 60,000 horsepower wind tunnel capable of blasting models with winds approaching twice the speed of sound. Czarnecki offered Mary hands-on experience conducting experiments in the facility, and eventually suggested that she enter a training program that would allow her to earn a promotion from mathematician to engineer. Trainees had to take graduate level math and physics in after-work courses managed by the University of Virginia. Because the classes were held at then-segregated Hampton High School, however, Mary needed special permission from the City of Hampton to join her white peers in the classroom. Never one to flinch in the face of a challenge, Mary completed the courses, earned the promotion, and in 1958 became NASA's first black female engineer. That same year, she co-authored her first report, Effects of Nose Angle and Mach Number on Transition on Cones at Supersonic Speeds.

Mary Jackson began her engineering career in an era in which female engineers of any background were a rarity; in the 1950s, she very well may have been the only black female aeronautical engineer in the field. For nearly two decades she enjoyed a productive engineering career, authoring or co-authoring a dozen or so research reports, most focused on the behavior of the boundary layer of air around airplanes. As the years progressed, the promotions slowed, and she became frustrated at her inability to break into management-level grades. In 1979, seeing that the glass ceiling was the rule rather than the exception for the center's female professionals, she made a final, dramatic career change, leaving engineering and taking a demotion to fill the open position of Langley's Federal Women's Program Manager. There, she worked hard to impact the hiring and promotion of the next generation of all of NASA's female mathematicians, engineers and scientists.

Mary retired from Langley in 1985. Among her many honors were an Apollo Group Achievement Award, and being named Langley's Volunteer of the Year in 1976. She served as the chair of one of the center's annual United Way campaigns, was a Girl Scout troop leader for more than three decades, and a member of the National Technical Association (the oldest African American technical organization in the United States). She and her husband Levi had an open-door policy for young Langley recruits trying to gain their footing in a new town and a new career. A 1976 Langley Researcher profile might have done the best job capturing Mary Jackson's spirit and character, calling her a "gentlelady, wife and mother, humanitarian and scientist." For Mary Jackson, science and service went hand in hand.

