



# CELEBRATING BLACK

With knowledge, we learn  
from the past and our  
present to create a brighter  
future for everyone

## INNOVATORS IN SCIENCE + TECHNOLOGY



### **Benjamin Banneker** (1731-1806)

- An almanac author, surveyor, landowner, and farmer who taught himself mathematics, astronomy, and natural history, and calculated a solar eclipse over the predictions of better-known astronomers.

### **Edward Bouchet** (1852-1918)

- A physicist and educator who was one of the first Black individuals in the US to graduate from Yale College and to gain a PhD.

### **Garrett Morgan** (1877-1963)

- A businessman and community leader who invented a three-position traffic signal and a smoke hood most notably used in a tunnel-construction disaster-rescue effort in 1916.

### **Elmer Imes** (1883-1941)

- The second Black American to earn a PhD in physics, his work in early applications of high-resolution infrared spectroscopy, led directly the study of molecular structure through infrared spectroscopy.

### **Katherine Johnson** (1918-2020)

- A NASA mathematician whose calculations of orbital mechanics were critical to the success of the first US-crewed spaceflights.

### **Mary Jackson** (1921-2005)

- NASA's first Black female engineer and an active supporter and promoter of its other women employees. Jackson was posthumously awarded the Congressional Gold Medal in 2019.

### **Marie Van Brittan Brown** (1922-1999)

- With her husband, Albert Brown, is known for the invention of the first home-security system; they are also credited with the earliest incarnation of closed-circuit television (CCTV).

### **Alma Levant Hayden** (1927-1967)

- A chemist and spectrophotometry expert—her team at the FDA determined the chemical composition of Krebiozen, exposing its inefficacy as a cancer treatment—and one of the first Black women scientists at the National Institutes of Health and the FDA.

### **Gladys West** (1930- )

- A mathematician who developed the satellite geodesy models that were incorporated into the Global Positioning System (GPS). In 2018, she was inducted into the US Air Force Space and Missile Pioneers Hall of Fame, one of the Air Force Space Command's highest honors.

### **Annie Easley** (1933-2011)

- A computer scientist and mathematician whose code-programming work analyzing alternative power technology for the Centaur upper-stage rocket project seeded the launch of future space vehicles and satellites, including the Cassini mission in 1997.

### **Willie Hobbs Moore** (1934-1994)

- The first Black woman to earn a PhD in physics in the US, she worked as a research scientist at the University of Michigan and as an engineer for Ford Motor Company.

### **Bettye Washington Greene** (1935-1995)

- A chemist, patent-holder, and polymers specialist, she is believed to be the first Black female chemist to work in a professional position at the Dow Chemical Company.

### **Arthur B. C. Walker, Jr.** (1936-2001)

- A Stanford professor, solar physicist, and pioneer of EUV/XUV optics, he is known for developing key technology for studying the solar corona as well as for his active mentorship of minority and women graduate students.

### **William M. Jackson** (1936- )

- An expert in photochemistry, lasers chemistry, and astrochemistry who has held research-scientist roles at Lockheed Martin and NASA's Goddard Space Flight Center.

### **George Robert Carruthers** (1939-2020)

- An inventor, physicist, engineer, and space scientist who helped create the Lunar Surface Ultraviolet Camera, a powerful-yet-compact ultraviolet camera/spectrograph for NASA's Apollo 16 mission.

### **George Edward Alcorn, Jr.** (1940- )

- A physicist and inventor who worked primarily for IBM and NASA. He invented the x-ray spectrometer, which earned him the NASA Goddard Space Flight Center award for Inventor of the Year in 1984.

### **Marshall Jones** (1941- )

- A Fellow of the American Society of Mechanical Engineering (ASME) and the Laser Institute of America, he pioneered the use of lasers for industrial-materials processing through his work at General Electric Global Research.

### **Patricia Bath** (1942-2019)

- An ophthalmologist, inventor, humanitarian, academic, and pioneer of laser cataract surgery.

### **Christine Darden** (1942- )

- A mathematician, data analyst, and aeronautical engineer who started her career at NASA as a human computer and was ultimately appointed director in the Program Management Office of the Aerospace Performing Center at Langley Research Center.

### **Shirley Ann Jackson** (1946- )

- A physicist and the first Black woman to earn a PhD from MIT, her scientific research enabled such inventions as the portable fax, touch-tone telephones, solar cells, and fiber optic cables.

### **Ronald McNair** (1950-1986)

- A NASA astronaut and physicist recognized for his work in laser physics. He died during the launch of the Space Shuttle *Challenger* on mission STS-51-L.

### **Anthony M. Johnson** (1954- )

- Recognized for his optoelectronics and ultrafast optics research, he was the first Black president of The Optical Society.

### **Mae C. Jemison** (1956- )

- An engineer, physician, and former NASA astronaut who was the first Black woman to travel into space, serving as a mission specialist on the Space Shuttle *Endeavour*.

### **Mark Dean** (1957- )

- A computer scientist and engineer whose achievements in groundbreaking technologies include the color PC monitor and the first one-gigahertz computer processor chip.

### **Maggie Aderin-Pocock** (1968- )

- A British space scientist and science educator, she was honored in 2020 with the Institute of Physics' William Thomson, Lord Kelvin Medal and Prize for her public engagement in physics.