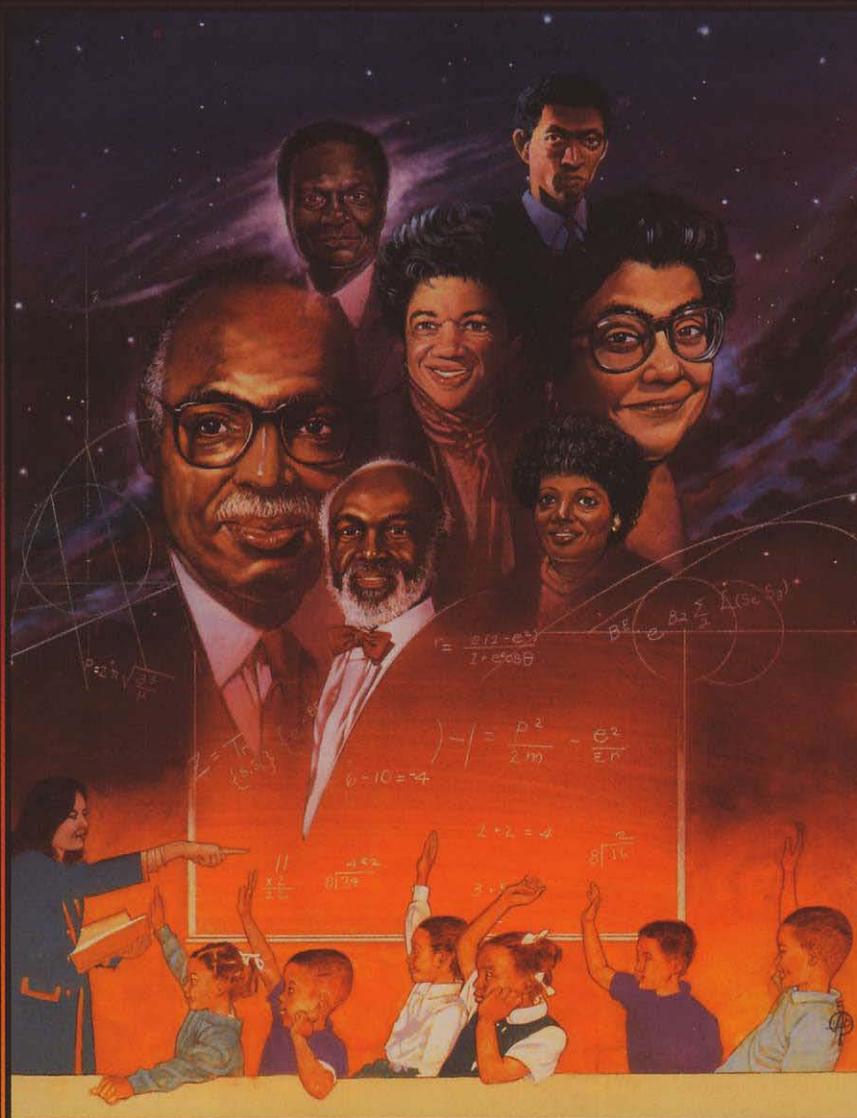




Fortieth Anniversary  
Pioneering the Future

# Superstars of Science

## YOUR ATTITUDE DETERMINES YOUR ALTITUDE



### NASA SUPERSTARS OF SCIENCE

- DR. JAMES KING, JR.**  
*Chemist*
- DR. GEORGE CARRUTHERS**  
*Aerophysicist*
- DR. LONNIE REID**  
*Mechanical Engineer*
- DR. CHRISTINE M. DARDEN**  
*Aerospace Engineer*
- DR. PATRICIA S. COWINGS**  
*Psychologist*
- DR. WESLEY HARRIS**  
*Aeronautical Engineer*
- DR. IRENE DUHART LONG**  
*Physician*

From Left to Right - Top to Bottom



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## Superstars of Science

### Dr. James King, Jr.—Chemist

Dr. King received a bachelor's degree in chemistry and mathematics (with highest honors) from Morehouse College in Atlanta, Georgia. He went on to the California Institute of Technology, where he received his master's in chemistry in 1955 and his doctorate in chemistry and physics in 1958.

Though trained as a chemist, Dr. King is now in charge of 4,000 scientist, engineers, and technicians at the Jet Propulsion Laboratory in Pasadena, California. The people in his organization work on many exciting programs including building robots to explore Earth's oceans and outer space, satellites to look down at Earth to study our environment, satellites to look out into space to unlock the secrets of the universe, and deep space probes to explore other planets in our solar system. Also, Dr. King's organization is developing new technologies for space habitats and for propulsion systems to boost future space explorers across the solar system.

In his spare time, Dr. King likes to play golf and bridge, and to work in his home workshop.

### Dr. George Carruthers—Astrophysicist

Dr. Carruthers graduated from Englewood High School in Chicago. He attended the University of Illinois in Urbana-Champaign, where he received a bachelor of science degree in aeronautical engineering in 1961. Dr. Carruthers also pursued his graduate education at the University of Illinois, completing a master's degree in nuclear engineering in 1962 and a doctorate in aeronautical and astronautical engineering in 1964.

For nearly 30 years, Dr. Carruthers has been a space scientist at the Naval Research Laboratory in Washington, D.C. His specialty is building instruments that detect radiation from astronomical objects and from Earth's upper atmosphere. The radiation he studies cannot be seen by the human eye and is blocked by Earth's atmosphere so it must be observed through space instruments. Dr. Carruthers has placed his instruments on high-altitude rockets to study three comets and was the first to detect the molecular form of hydrogen gas between the stars in our Galaxy. This is important for estimating the total amount of matter in the universe. He built a camera that was carried to the Moon, where Apollo 16 astronauts photographed Earth's atmosphere and objects in deep space. He also built a camera for a Space Shuttle mission in 1991 and is working on new cameras for deep space missions.

Dr. Carruthers spends his free time bicycle riding and taking pictures as an amateur photographer.

### Dr. Lonnie Reid—Mechanical Engineer

Dr. Reid graduated from Highland High School in Gastonia, North Carolina. He earned a bachelor of science degree in mechanical engineering from Tennessee State University in 1961. He went on to the University of Toledo, where he received a master's degree in mechanical

engineering and a doctorate in engineering science, completing his studies in 1990.

An internationally recognized expert on the compressors of aircraft engines, Dr. Reid heads the Internal Fluid Mechanics Division at the NASA Lewis Research Center in Cleveland, Ohio. The engineers in his organization study the flow of air through aircraft engines. They "fly" new engine designs in wind tunnels to measure the temperature, velocity, and density of air inside an engine and use computer simulations to predict engine performance. Dr. Reid and his department are trying to develop aircraft engines that are quieter and cleaner than engines on passenger aircraft today.

### Dr. Christine M. Darden—Aerospace Engineer

Dr. Darden was valedictorian of her graduating class at Allen High School in Asheville, North Carolina. She attended the Hampton Institute and received a bachelor's degree (with highest honors) in mathematics in 1962. She earned a master's degree in mathematics from Virginia State College in Petersburg, Virginia in 1978. In 1983, Dr. Darden earned a doctorate in mechanical engineering, specializing in fluid mechanics (study of the flow of gases and liquids) from George Washington University in Washington, D.C.

Dr. Darden is a senior project engineer in the Advanced Vehicles Division at the NASA Langley Research Center in Hampton, Virginia, where she is the leader of the Sonic Boom Group. Her group works on aircraft that fly faster than the speed of sound (supersonic aircraft). Group members create computer simulations to predict how air will flow around aircraft. The simulations predict air pressures on the aircraft and how efficiently the aircraft would fly. The simulations also predict sonic booms—when they happen and how loud they could be—so that aircraft designers can try to minimize their impact. Dr. Darden is an expert in designing wings of supersonic aircraft that cut down on sonic booms.

When she's not running sophisticated computer simulations, Dr. Darden enjoys singing, dancing, and playing cards.

### Dr. Patricia S. Cowings—Psychologist

Dr. Cowings graduated from New York City's High School of Music and Arts. In 1970, she earned a bachelor's degree in psychology from the State University of New York at Stony Brook. She went on to the University of California at Davis where she completed her studies with a master's and doctorate in psychology in 1973.

Dr. Cowings is the Director of Psychophysiological Research at NASA's Ames Research Center in Moffett Field, California. Through her work, Dr. Cowings helps astronauts cope with space motion sickness. Astronauts in the microgravity environment of space sometimes feel as though they have the flu. They get nauseated, headaches,

dizzy, drowsy, or sweaty. Dr. Cowings teaches astronauts to use their minds to control their bodies. Astronauts learn to control their heart rate, breathing, and body temperature to overcome space motion sickness so that they can conduct important space experiments.

When she's not busy helping astronauts prepare for space flights, Dr. Cowings enjoys painting, gardening, and writing science fiction.

### Dr. Wesley Harris—Aeronautical Engineer

Dr. Wesley Harris graduated from Armstrong High School in Richmond, Virginia, received a bachelor's degree in aeronautical engineering (with honors) from the University of Virginia in 1964, and a doctorate from Princeton University in 1968.

Though trained as an engineer, Dr. Harris is now Associate Administrator of the top management team for the NASA Headquarters Office of Aeronautics. Aeronautics is the science that deals with the operation of aircraft. NASA's Office of Aeronautics researches safety features for flight as well as develops technology for aircraft of the future. One example is a plane that will carry 300 passengers on flights across the ocean, traveling at Mach 2.4 (more than twice the speed of sound). A passenger on a High Speed Civil Transport could fly from California to Australia in seven hours—that's half the time it takes today. A recent NASA safety innovation is a system to warn pilots of sudden winds that could cause the pilots to lose control of their aircraft.

In his spare time, Dr. Harris enjoys sports—particularly squash, running, and pick-up basketball.

### Dr. Irene Duhart Long—Physician

Dr. Long graduated from East High School in Cleveland, Ohio. She attended Northwestern University in Evanston, Illinois, where she received a bachelor's degree in pre-medicine and biology in 1973. In 1977, she received a doctor of medicine degree from the St. Louis University School of Medicine.

Dr. Long is Chief of the Medical and Environmental Health Office at the John F. Kennedy Space Center in Florida. Dr. Long manages a team of over 200 medical personnel and environmental health specialists who ensure that those who work on NASA's Space Shuttle remain healthy. She is responsible for medical emergencies at Kennedy and her team strives to create an environment where people are protected from harmful chemicals and have enough light and fresh air to do their jobs. Her team also helps researchers study what happens to an astronaut's body in space—research that is vitally important to space explorers who will one day return to the Moon or travel to Mars.

When she's not looking after the health of thousands of Space Shuttle workers, Dr. Long replaces by collecting dolls, doll house miniatures, antique glassware, and furniture.