

S#10

S#10



319 S. Naperville Road Wheaton, IL 60187 www.questionsgalore.net
Phone: (630) 580-5735 E-Mail: info@questionsgalore.net Fax: (630) 580-5765

STUDY GUIDE:
FAMOUS ASTRONOMERS, ASTRONAUTS, and GEOLOGISTS

FAMOUS ASTRONOMERS

- **PTOLEMY** (Tol uh mee): An ancient Greek astronomer who calculated that the earth was the center of the solar system, and the sun, planets, moon, and stars revolved around the earth.
- **ARISTOTLE** (384 – 322 B.C.): Provided proof that the earth had a spherical shape.
- **TYCHO BRAHE** (1572): Spotted the first supernova, proving that the heavens do change over time.
- **NICOLAUS COPERNICUS** (1473 – 1543): A Polish astronomer who developed the theory that the sun is the center of the solar system and that all the other heavenly bodies revolve around the sun. He's considered **the founder of modern astronomy**.
- **GALILEO GALILEI** (1564 – 1642): Italian scientist and mathematician who was called the first modern scientist and who is best known for his mathematical study of motion and other bodies.
 1. Contributions to the field of astronomy
 - A. He improved, but **did not** invent, the telescope. He developed **the first refracting telescope**.
 - B. His discoveries in astronomy
 1. The moon's surface was rough and irregular.
 2. The moons of Jupiter
 3. The rings of Saturn
 4. The phases of Venus, similar to our moon
 5. Sunspots
 6. Confirmed the idea of Copernicus – that the sun is the center of the solar system, and the earth moves around the sun.

Page 2, FAMOUS ASTRONOMERS, ASTRONAUTS, AND GEOLOGISTS

2. Other inventions:
 - A. The first thermometer
 - B. Hydrostatic balance that found the specific gravity of any object by weighing it in water.
- **ROBERT H. GODDARD**: Built the first rocket in 1926 by combining gasoline with liquid oxygen and burning this mixture. The rocket went straight up for 184 feet at 60 mph for 2 and ½ minutes. It was 10 feet long. He continued to build larger rockets and drew up plans for multistage rockets. In 1935, he designed a rocket that reached a speed of 500 mph and an altitude of 7,200 feet. He was called the **father of modern rocketry**.
- **EDMUND HALLEY** (1656 – 1742): An English astronomer who is best known for predicting the return of a comet, **Halley's Comet**, which bears his name. **He did not discover the comet**, but he was the first to realize that this same comet had previously appeared in 1456, 1531, 1607, and 1682. He predicted that the comet would reappear in 1759, which it did. The comet appears every 75 to 79 years. It was seen in 1986, and it is due back in 2062.
 - A. Other contributions
 1. Compiled a catalog of the stars seen in the Southern Hemisphere
 2. Published a book called Synopsis of the Astronomy of Comets
 3. Discovered an accurate way to measure the distance from the sun to the earth
 4. Produced the first meteorological weather chart of the world to show prevailing winds
 5. Made the first charts of the Atlantic and Pacific Oceans
- **EJNAR HERTZSPRUNG** (Danish Astronomer) and **HENRY NORRIS RUSSELL** (American Astronomer) early 1900s: Discovered that as the magnitude of a star increases, the temperature of that star also increases. They developed a diagram in which the surface temperature of stars is plotted along the horizontal axis, while the absolute temperature is plotted along the vertical axis. This chart, called the Hertzprung-Russell (H-R), is still used today by astronomers.
- **EDWIN HUBBLE**: An American astronomer of the twentieth century. He was the first to show that galaxies other than the Milky Way did exist. He also was the first to notice that objects which are moving away from an observer tend to have a reddish cast. He called this phenomenon the **red shift**, and he used it as a basis for the expansion of the universe by a means similar to the Big Bang Theory. The **Hubble Telescope** was named after him. This large, optical telescope was placed into orbit in 1989 and was the first permanent observatory located above the earth's atmosphere.

Page 3, FAMOUS ASTRONOMERS, ASTRONAUTS, AND GEOLOGISTS

- **IMMANUEL KANT:** Theorized that the sun was part of a vast galaxy but that there were other galaxies scattered throughout space, too. He also suggested that the sun and planets were formed from the same elements and in the same way.
- **JOHANNES KEPLER:** German astronomer and mathematician who discovered that the planets orbit the sun in elliptical or oval orbits, not in perfect circles.
- **MARIA MITCHELL (1847):** American Astronomer who discovered a new comet. First woman member of the American Academy of Arts and Sciences in 1848. Taught astronomy at Vassar College.
- **SIR ISAAC NEWTON:** Theorized that planets maintained their orbits because of two factors: inertia and gravity. Inertia causes the planet to move in a straight line, while gravity pulls the planet toward the sun, causing an elliptical orbit.
- **HERMANN OBERTH:** Born in Romania, but did most of his rocket research in Germany. In 1942, he and Dr. Von Braun built a V-2 rocket that flew 60 miles into space. After World War II, he worked in Huntsville, Alabama on rocket research, but he retired and went back to Germany in 1958.
- **DAVID RITTENHOUSE (1770):** Built a precise model of the solar system.
- **HARLOW SHAPLEY:** Theorized that the entire universe could be found in one huge galaxy.

DISCOVERY OF THE PLANETS OR OTHER HEAVENLY BODIES:

JUPITER: Galileo discovered four of Jupiter's moons.

SATURN: Galileo discovered the rings of Saturn.

URANUS: Sir William Herschel (1781): English Astronomer discovered the planet, Uranus.

NEPTUNE: John Couch Adams (1845): English astronomer, calculated where Neptune should be in space, based upon the orbital path of Uranus, which appeared to be affected by the gravitational force of another body.

Johann Galle: German astronomer, located Neptune from Germany's Berlin Observatory, exactly where Adams had predicted.

PLUTO: Percival Lowell: Suggested that another planet's gravity was pulling on both Neptune and Uranus.

Page 4, FAMOUS ASTRONOMERS, ASTRONAUTS, AND GEOLOGISTS

Clyde Tombaugh, originally from Illinois, discovered Pluto in 1930 exactly where Lowell suggested.

James Christy (1978): discovered Charon, Pluto's moon.

FAMOUS ASTRONAUTS

- **YURI GAGARIN** (1961): A Russian cosmonaut, **first human put into space, first person to orbit the earth (1961)**
- **ALAN B. SHEPARD, JR.** (1961): First American in space (1961)
- **JOHN H. GLENN** (1962): First American to circle the earth (1962)
- **VALENTINA TERESHKOVA** (1963): Russian, first woman in space (1963)
- **VIRGIL (GUS) GRISSOM, EDWARD H. WHITE, ROGER B. CHAFFEE** (1967): All three astronauts were being trained for the first mission in NASA's Apollo Program. While sitting atop a Saturn Rocket on the Cape Canaveral launch pad, a fire broke out in the cockpit. **The three astronauts died of burns and suffocation** before the technicians could rescue them.
- **VLADIMIR KOMAROV** (1967): Russian cosmonaut died when the parachute of the Soyuz 1 space capsule did not open, and the capsule crashed upon reentry.
- **NEIL ARMSTRONG** (1969): First person to step onto the moon's surface. Famous Quotation associated with this venture: "That's one small step for man, one giant leap for mankind."
- **EDWIN (BUZZ) ALDRIN** (1969): Second man to step onto the moon's surface right behind Neil Armstrong.
- **MICHAEL COLLINS** (1969): Remained in orbit around the moon in the Apollo Command Module, the Columbia, while Armstrong and Aldrin stayed on the moon.
- **JOHN YOUNG AND ROGER CRIPPEN** (1981): Piloted the United States first space shuttle, the Columbia.
- **SALLY RIDE** (1983): First American female astronaut in space. She traveled on the Challenger.
- **GUION BLUFORD** (1983): First African American in space. He traveled on the Challenger.

Page 5, FAMOUS ASTRONOMERS, ASTRONAUTS, AND GEOLOGISTS

- **BRUCE McCANDLESS and ROBERT STEWART (1984):** First humans to fly free of the spacecraft with jet-propelled backpacks. This was during the fourth flight of the Challenger.
- **JAKE GARN (1985):** Utah Senator, first congressman in space. He traveled aboard the Discovery.

ASTRONAUTS ABOARD THE CHALLENGER WHEN IT EXPLODED IN 1986: (THERE WERE NO SURVIVORS)

1. **MICHAEL J. SMITH:** Challenger Pilot
2. **FRANCIS R. SCOBEE:** Challenger Commander
3. **CHRISTA McAULIFFE:** Social Studies Teacher from Concord, New Hampshire
4. **JUDITH A. RESNIK:** Mission specialist, Second American Woman in Space when she flew earlier on the Discovery in 1984.
5. **RONALD E. McNAIR:** Mission Specialist who was an expert laser physicist. Second American, African American to travel in space.
6. **ELLISON S. ONIZUKA:** Mission Specialist
7. **GREGORY B. JARVIS:** Payload Specialist

THE NASA MERCURY PROJECT ASTRONAUTS:

Seven men were chosen by NASA to become part of the first manned space flights. They were:

ALAN SHEPARD
JOHN GLENN
VIRGIL (GUS) GRISSOM
SCOTT CARPENTER
WALTER SCHIRRA
GORDON COOPER
DONALD SLAYTON.

FAMOUS GEOLOGISTS IN EARTH SCIENCE

- **LOUIS AGASSIZ (1840):** Theorized that huge sheets of ice once extended from the North Pole to Central Europe, and they changed the surface of the earth as they slowly moved over it.
- **RACHEL CARSON (1962):** Published Silent Spring to awaken the public to the dangers and problems of pollution.
- **JAMES HUTTON (1775):** Developed the idea of uniformitarianism, which said that features on the earth were formed by gradual change and not by explosions or other drastic methods. Rivers and canyons were formed by weathering, erosion, and other elements that had always been present in that area.
- **CHARLES LYELL (1830-1833):** Published the first geology textbook called Principles of Geology. In this book he expressed his firm beliefs that the earth's surface has changed slowly over time.
- **FRIEDRICH MOHS:** Developed a hardness scale for the comparison of mineral hardness. Talc, the softest mineral, was listed as a 1 on the scale, and a diamond, the hardest mineral, was listed as a 10.
- **CHARLES RICHTER:** Developed a scale that measures the strength of an earthquake based upon observations. The scale measures how much energy an earthquake releases by assigning a number from 1 to 10. The more energy that is released, the higher its number on the scale.
- **ERNEST RUTHERFORD (1905):** Theorized that the half-life of radioactive minerals could be used to determine the age of the mineral.
- **ALFRED WEGENER:** Developed the theory of Continental Drift, which stated that at one time, the continents were all formed together into a giant continent, or super-continent called Pangaea. Over time, the continents drifted apart to their present locations.