



## ASK A SPACE SCIENTIST

Our universe is full of mysteries, and some of the most mind-boggling are in space. Curious kids asked questions, and we sent them to two Bahá'í scientists who work for the National Aeronautics and Space Administration (NASA). Have questions about space? Send them to [brilliant@usbnc.org](mailto:brilliant@usbnc.org) (with your name and age).

### How are black holes created?

—Dominik, age 10

Hi, Dominik,

Stars like the Sun are very massive—about 330,000 times as massive as the Earth. They shine for many years, slowly using up the hydrogen that is the source of their energy. They eventually get cooler, and because of their strong gravity, they also get smaller. If a star is about three times as massive as the Sun, Einstein's relativity theory predicts it will eventually become so dense that it collapses into a black hole. When a star becomes a black hole, no light escapes from it. We can only know it's there by the effect of its strong gravity on nearby stars, or by the x-rays that are emitted from any surrounding matter as it's swallowed into the black hole.

—Steve



In this illustration, matter flows into a black hole millions or billions of times more massive than our sun. Dust and gas form a disk as they're pulled into the hole.

BACH IN TIME

Mary Jackson, an American born in 1921, earned degrees in math and physical science. She became NASA's first African American female engineer in 1958. She studied the behavior of air as it flows around airplanes, especially at speeds faster than sound, which is known as:

U E R O N I C





## Can you live on the moon? —Marisol, age 12

Hi, Marisol,

Yes! You can live on the moon. But it's not easy or cheap. Earth's moon doesn't have an atmosphere; when you stand on the moon, you're standing in space. The moon is mostly rock, with some metals, and small amounts of water ice near its poles. It's a desolate place that doesn't readily provide anything humans need to live, except a bit of gravity; a dusty surface to stand on; and bright, unfiltered sun for about 15 straight days out of every 30. Twelve Apollo astronauts visited the moon between 1969 and 1972, but each stay was only a few days. They brought everything they needed with them: a breathable atmosphere in their spacecraft and spacesuits; food and water; a toilet; some first aid; scientific instruments; a way to talk to Earth; a way to get back to Earth; and in later missions they even brought an electric car.

To live on the moon, you'd want to land near the poles to harvest water ice for drinking. You'd also want to grow some of your own food instead of having it all shipped from Earth.

— George



In 1972, astronauts Gene Cernan (right) and Harrison "Jack" Schmitt did a training exercise to prepare for their drives on the moon.



**STEVE SCOTTI** is a research engineer at NASA Langley Research Center in Virginia, U.S. He works to develop lighter, stronger materials and structures for aircraft and spacecraft. Watching the first astronaut launched into space inspired his interest in space exploration. He enjoys sharing his enthusiasm about science and space with kids.



**GEORGE HATCHER** is an avionics engineer at the Kennedy Space Center in Florida, U.S. He works on electrical systems of uncrewed rockets. He also studies planetary science at the University of Central Florida. Working for NASA is a dream come true for George. He's aspired to be an astronaut since he was three. He's one of 100 finalists in the Mars One Project, which aims to create a human settlement on Mars.

## COSMIC QUIZ

**Pulsar is ...**

- A. A space-themed video game
- B. A rotating collapsed star
- C. The brightest star seen from Earth
- D. The name of the Uplifters' leader in the Lightning and Luna comic
- E. B and D

