



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 a space scientist. Have questions about space? Send them to brilliant@usbnc.org (with your name and age).

Is it possible to make a car that could drive on land and fly in the air? – Jackson, age 12

Hi, Jackson,

There are groups around the world that are trying to develop flying cars. Some have built prototypes that actually fly! Early flying car designs had to deploy wings and propellers to provide the lift and thrust forces needed to fly. When the car landed, the wings would fold up for driving. They were like small airplanes that could taxi on the road. But they were expensive, many people were concerned about their safety, and the drivers had to be licensed pilots.

Today, new ideas are being developed that could lead to flying cars being commonplace. Cars with fans or rotors to take off like helicopters are being tried. Some look like large quadcopter drones and can use electric motors. But the batteries that supply electricity need to be much lighter and more powerful than those in today's electric cars. For flying cars to be operated without licensed pilots, they need to be "self-flying"—similar to current efforts to make cars "self-driving." I believe these technologies will be perfected. You may one day have your own flying car! – Steve



A future eVTOL (electric vertical take-off and landing) aircraft might look like this—and create no air pollution.

COSMIC QUIZ

In 1930, American astronomer Clyde Tombaugh discovered the ninth planet, Pluto. In 2006, after finding other small objects in the solar system, astronomers reclassified Pluto as a:

- A) Fake planet
- B) Petite planet
- C) Mini planet
- D) Dwarf planet



Pluto's heart-shaped area is called Tombaugh Regio.



How long will it take until we have spaceships that can go light-speed? – Naim, age 13

Hi, Naim,
The speed of light—almost 186,000 miles per second (300,000 km per second)—is the fastest speed possible in our current understanding of physics. It’s called the speed of light because only light or other electromagnetic energy, like radio signals, can go that fast.



The Large Hadron Collider is a 16.6-mile-long circular tunnel. Powerful magnets inside it crash particles, like protons, at close to the speed of light.

The theory of relativity says anything with mass, such as a spaceship, can’t go that fast. We haven’t tested this with a spacecraft. But using small atomic particles such as protons, physicists have reached 99.999999% of the speed of light (pretty close!). They used the Large Hadron Collider (LHC), the world’s most powerful particle accelerator. So, as far as we know, a spaceship can’t travel at the speed of light.

But we don’t know all the laws of physics. For example, the theory of relativity predicted black holes, and they were discovered. It also says “white holes” could exist, but none have been found. Some physicists think a tunnel (or wormhole) could connect a black hole and a white hole, and perhaps be used to travel great distances in space. We’re making exciting discoveries that I believe we’ll use to explore space! – Steve



STEVE SCOTTI is *Brilliant Star’s* STEAMS Education Advisor and a Distinguished Research Associate at NASA Langley Research Center in Virginia, U.S. His background is in developing lighter, stronger materials and structures for aircraft and spacecraft. Watching the first astronaut launched into space inspired his interest in space exploration.

ON THE WEB

In our Space Ace video interviews, meet two amazing astronauts at Dr. Scotti’s STEAMS Station.



LELAND MELVIN was a pro football player and a NASA astronaut. When he went to space, it changed his perspective forever.

PEGGY WHITSON was a NASA astronaut and the first female commander of the International Space Station. She broke other records, too.



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BACH IN TIME

In 1971, David Scott and James Irwin were the first people to drive on the Moon, covering about 17 miles (27 km). They drove a lunar roving vehicle, often called a:



- A) Dune buggy
- B) Moon buggy
- C) Moonmobile
- D) Lunarspeeder