



## 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](mailto:brilliant@usbnc.org) (with your name and age).

What are some cool things we might be doing with space or science technology in the next generation?

— Kiyon, age 16

Hi, Kiyon,

There are so many cool things that we might do in science and space in the near future! I can give a couple of examples that excite me. In recent years, space scientists have discovered that many stars have planets in orbit around them. But scientists have only seen a few of these planets, and they were tiny specks of light. With new telescopes on Earth and orbiting observatories, such as the James Webb Space Telescope, we'll be able to see images of these planets better and perhaps even tell if they can support life.\* Another advance in science that is nearly here is electricity from **nuclear fusion** (producing energy from combining hydrogen atoms to form helium). We've known about fusion for decades. But with recent advances, such as strong, superconducting magnets that contain hot fusion gases with magnetic fields, we're close to having fusion power plants. Fusion and other green energy sources will help reduce the carbon dioxide in the atmosphere that is causing climate change. — Steve



The Tarantula Nebula is a star-forming region about 161,000 light-years away! This image from the James Webb Space Telescope revealed thousands of stars never seen before.

## COSMIC QUIZ

UY Scuti is one of the largest stars, *five billion* times the volume of the Sun. If our Sun were that big, it would almost reach Saturn! Even bigger than a supergiant, this star is a:

- A) Hulk star
- B) Hypergiant
- C) Superstar
- D) Mammoth star



Westerlund 1 star cluster has stars nearly as large as UY Scuti.



**What process do you use when you encounter a problem with what you're working on? – Adayna, age 13**

Hi, Adayna,

My favorite approach has three aspects: 1) figure out the basic facts, 2) find solutions used with similar problems, and 3) make an attempt, learn from the results, and try again if needed.

For example, let's say you want to fix a broken wooden step. You need to understand why it broke (the **root cause**). You search the internet or talk to builders and learn that the wood may have rotted, it wasn't strong enough, or it wasn't thick enough. In all cases, it couldn't handle the stress of using it (#1). You also learn that the strength of the step you need depends on the stress in the wood when you walk on it, and there's a formula for that (#2). You replace the step with wood that's 50% thicker, because the formula shows the step will get less than half the stress of the original. You test the new step. If it breaks again, you can get stronger or thicker wood (#3).

You solved the problem by learning more about it and about similar problems, taking steps to solve it, checking your solution, and improving it if necessary. — Steve



Problem-solving skills help you in all types of sciences and arts.



**STEVE SCOTTI** is *Brilliant Star's* STEM 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 STEM 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.



**BACH IN TIME**

Dr. Carl Sagan (1934–1996) was an award-winning American astronomer and writer. He's also famous for:



- A) Hosting *Cosmos*, a popular TV show
- B) Co-founding the non-profit Planetary Society
- C) Working on NASA missions to other planets
- D) All of the above



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