



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

Is it hard to sleep in space, using a sleeping bag attached to the wall? – Bahia, age 14

Hi, Bahia, Sleeping in space is wonderful. You float into your crew quarters, zip up in your sleeping bag, and fall asleep. Remember, we are weightless, so the orientation of the sleeping bag makes no difference to your feelings. –Don



Astronauts Mike Massimino (left) and Michael Good rest in sleeping bags attached to lockers on Space Shuttle Atlantis in 2009.

What do astronauts in space eat? How does it last from Earth to the Moon? – Darya, age 13

Hi, Darya, In space we eat camping food. It's either freeze-dried, where we add hot water, or the food is sealed in pouches, like tuna fish from the store. Once rehydrated, or if the package is opened, we have no way to keep it from spoiling. We only prepare what we can eat in one meal, with no leftovers. –Don



In space, meals are held in place with magnets, springs, and Velcro.



ON THE WEB

When NASA Astronaut Leland Melvin went to space, it changed his perspective forever. Find out how in our new Space Ace video: www.brilliantstarmagazine.org/videos/space-ace-leland-melvin

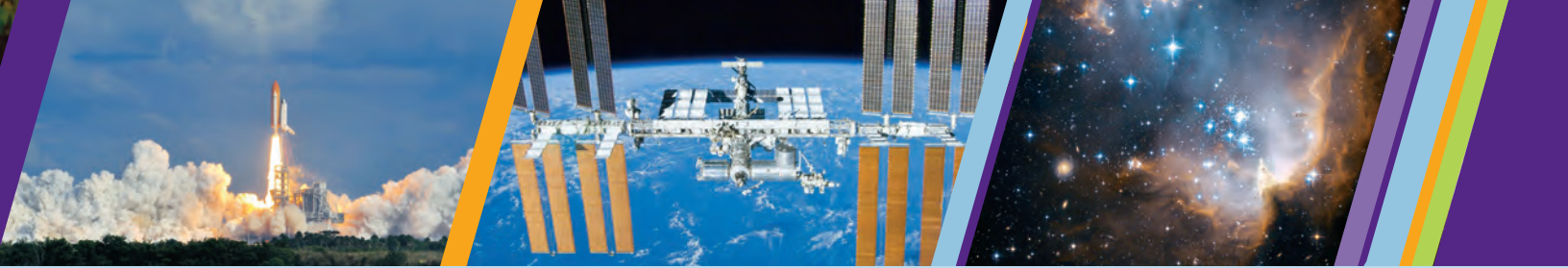
COSMIC QUIZ

When hydrogen atoms get squeezed together inside stars, they transform into helium and release energy, which includes the light that makes the stars shine. This process is called:

- A) Fusion
- B) Fracking
- C) Fermenting
- D) The Force



Stars in globular cluster NGC 1805



What do you think about when you're designing spacecraft? – Rachel, age 12

Hi, Rachel,
Designing a spacecraft is similar to designing an airplane, but more difficult. The first thing you consider is making the spacecraft as efficient as possible. If you can make a spacecraft lighter, less energy is needed, and you can use a smaller rocket to launch it. You can make a spacecraft lighter by using lighter materials and more efficient vehicle structures. You can use smaller and lighter systems (such as the communication and life support systems), and put everything together in an efficient layout.



An artist's concept of NASA's Space Launch System (SLS), the most powerful rocket built for deep-space missions.

There are also concerns about a vehicle's safety and reliability. An airplane can be repaired between flights, but not a spacecraft. So most systems on a spacecraft are designed to be "redundant," having a backup in case something goes wrong with the main system. Some critical systems on a spacecraft have additional backups in case the redundant system fails! And when the spacecraft is crewed, the crew's health and safety are most important. We're still learning how to design spacecraft to take care of astronauts for missions beyond Earth's orbit. – Steve



DON PETTIT is an active NASA astronaut who has been on three flights to the International Space Station. He lived there for over a year in total and spent 13 hours on spacewalks. While aboard, he sent videos to Earth and even invented a zero-G coffee cup. An avid photographer since sixth grade, he took thousands of photos from space and published his favorites in the book *Spaceborne* in 2016.



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, and he enjoys sharing his enthusiasm about science and space with kids.

BACH IN TIME

Cecilia Payne-Gaposchkin earned the first doctorate degree in astronomy from Radcliffe College in 1925. She's known for discovering that stars are mostly made of:

H Y R G N and H L I M

