



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).

How was our galaxy formed in a spiral shape? – Hugo, age 9

Hi, Hugo,
Scientists don't fully know how the Milky Way galaxy was formed. But they know a lot about its structure from years of study. It has a disk shape with a bulging center and spiral arms. The bulging center contains the oldest stars in the galaxy. These stars were formed because gravity collapsed clouds of gas in the early universe. The spiral arms which orbit the center of the galaxy have younger stars. Our Sun is one of these younger stars.

But the origin of the spiral arms is less certain. They could be from smaller galaxies that merged with the Milky Way. They might be from near collisions with other galaxies. Scientists now use computers to better understand how galaxies form. Computers can simulate the universe evolving, from soon after the Big Bang until the present day. Spiral galaxies develop in these simulations over billions of years, through gravity and collisions. –Steve



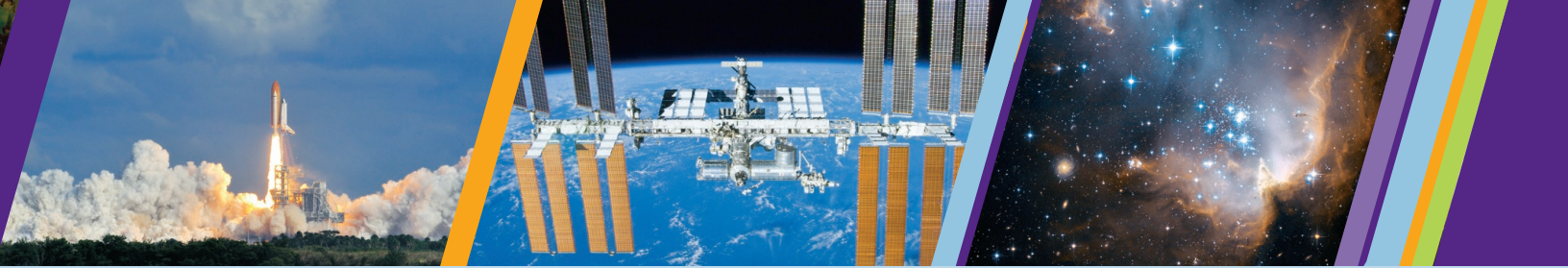
Artist's concept of our Milky Way galaxy, which has two major spiral arms extending from the ends of a central bar of stars. Between them are minor arms.

BACK IN TIME

In 1983, aboard the space shuttle *Challenger*, Guy Bluford became the first African American to fly in space. What did he do during the launch?

- A) Practiced magic tricks
- B) Counted backward from 1,000
- C) Laughed and giggled with glee
- D) Sang the U.S. national anthem





Do the astronauts ever get scared to go to space?

– Christopher, age 14

Hi, Christopher,
Not really! In my case, I trained so much for each of my flights that I was extremely well prepared. I felt I was ready to handle anything! My confidence was soaring! But I will admit that I get scared when I watch a launch. This is probably because when I watch a launch I am not doing anything, just watching. When you are inside the rocket, an astronaut is very busy running checklists, moving switches, checking systems, and making radio calls. It helps to be busy!

One way to ease potential fears is to work together as a group. This is something astronauts must do to successfully complete a mission. We support each other and provide each other with a source of strength. As the mission commander, I want my crew to be 100% prepared for the launch. I want them to be focused on their duties, not worried about the launch. Therefore, I assure them of my confidence in them, as well as my confidence that our spacecraft was prepared by the best engineers and technicians in the world! –Eileen



Space shuttle *Discovery*, commanded by Eileen Collins (the first female shuttle commander) in 2005



STEVE SCOTTI is Brilliant Star’s STEM Education Advisor and 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, and he enjoys sharing his enthusiasm about science and space with kids.



EILEEN COLLINS is a retired Air Force officer, pilot, test pilot, and astronaut. She flew in space four times, including the first mission to rendezvous with the Russian space station Mir (1995), the sixth docking flight with Mir (1997), the deployment of the Chandra X-Ray Observatory (1999), and the “Return to Flight” mission, which tested tools and techniques to keep the shuttle safely flying (2005). She is currently a consultant in the aerospace industry.

COSMIC QUIZ

Which planet is the hottest in our solar system? Its surface reaches 880°F (470°C), which would melt lead.

- A) Mercury
- B) Venus
- C) Zilizag
- D) Jupiter

