

Aurora borealis: A candy-colored glitter bomb of charged particles

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Image 1: Astronauts Scott Kelly and Tim Peake shared a series of aurora photographs taken from the International Space Station in 2016. Photo from NASA.

When Don Hampton was a student in Alaska, he looked up at the night sky and saw candy-colored lights swirling above his head. Fireworks? No, nature's laser show.

"The sky lit up with patterns of green and bright pink," he said. "The motion and scale were just amazing."

Hampton was experiencing the aurora borealis. It is an amazing light show usually visible in the Northern Hemisphere from September through March. He now sees the northern lights 30 to 40 times a year. That's one of the benefits of being a science professor at the University of Alaska Fairbanks.

"I never get tired of watching them," he said.

Elizabeth MacDonald also studies the northern lights for a living. She is a research scientist at NASA, the U.S. space agency. The splashy display never fails to amaze her. "You just look up at the

sky and say, "Wow," she said.

We asked the two experts to explain the science behind the aurora borealis.

What causes the aurora borealis?

The sun releases energy in the form of light and particles that travel 93 million miles to Earth. It is like "a glitter bomb of charged particles," MacDonald said. The particles crash into gases in Earth's upper atmosphere. This creates ribbons of color that move like dancers on a dark stage. The most common color combination is neon green with pink edges. Sometimes the sky looks like a paint box with shades of red, blue and violet.

Where does it happen?

The Earth's magnetic field draws the sun's particles toward the poles. The aurora borealis takes place near the North Pole. Its twin, the aurora australis, takes place near the South Pole. It occurs in the Southern Hemisphere during their winter months of March through September. One of the best places to see the aurora borealis is Alaska. You can also get a great view from Iceland, northern Scandinavia and northern Canada.



What are the best conditions for seeing the lights?

The ideal setting is pitch-black with a clear, moonless sky. "You have to be able to see the stars," MacDonald said. Winter is the best season for viewing. Summer is the worst because near the Arctic Circle the sun is out all night, or most of it, so the northern lights can't be seen. The spectacle often peaks around midnight and can last from five minutes to several hours. For gear, you just need your eyes, but a digital camera can help, too. "Cameras have better night vision," MacDonald said. "They pick up more color." For a sharper image, Hampton recommends placing your camera on a tripod, railing or another steady surface.



If you live far from the lights, can you still see them?

Yes, you can. Several groups set up video cameras to capture the northern lights and share the real-time images on their websites. Bundle up in your coziest pajamas and check out the Geophysical Institute, part of the University of Alaska Fairbanks. You can also check out AuroraMax, which is run by the Canadian Space Agency.

Quiz

1 Read the section "What causes the aurora borealis?"

Select the sentence that BEST explains what causes the colorful lights in the aurora borealis.

- (A) The sun releases energy in the form of light and particles that travel 93 million miles to Earth.
- (B) The particles crash into gases in Earth's upper atmosphere.
- (C) This creates ribbons of color that move like dancers on a dark stage.
- (D) Sometimes the sky looks like a paint box with shades of red, blue and violet.

2 Read the section "Where does it happen?"

Which sentence explains why you can only see the aurora borealis and the aurora australis in certain places?

- (A) The Earth's magnetic field draws the sun's particles toward the poles.
- (B) It occurs in the Southern Hemisphere during their winter months of March through September.
- (C) One of the best places to see the aurora borealis is Alaska.
- (D) You can also get a great view from Iceland, northern Scandinavia and northern Canada.

3 Which sentence from the article BEST supports the article's CENTRAL idea?

- (A) When Don Hampton was a student in Alaska, he looked up at the night sky and saw candy-colored lights swirling above his head.
- (B) It is an amazing light show usually visible in the Northern Hemisphere from September through March.
- (C) Several groups set up video cameras to capture the northern lights and share the real-time images on their websites.
- (D) Bundle up in your coziest pajamas and check out the Geophysical Institute, part of the University of Alaska Fairbanks.

4 Read the paragraph from the article.

The ideal setting is pitch-black with a clear, moonless sky. "You have to be able to see the stars," MacDonald said. Winter is the best season for viewing. Summer is the worst because near the Arctic Circle the sun is out all night, or most of it, so the northern lights can't be seen. The spectacle often peaks around midnight and can last from five minutes to several hours. For gear, you just need your eyes, but a digital camera can help, too. "Cameras have better night vision," MacDonald said. "They pick up more color." For a sharper image, Hampton recommends placing your camera on a tripod, railing or another steady surface.

How does this paragraph support the MAIN idea of the article?

- (A) It shows which countries are the best for viewing the aurora borealis and how long they last.
- (B) It gives people information about how to view the aurora borealis at home.
- (C) It illustrates the reason why the aurora borealis occurs and how you can see it.
- (D) It tells people when they should go see the aurora borealis and how to view it.