

Families' Guide to Comets: *Comet Siding Spring*

What are comets?

Comets are fascinating objects made of ice and rock that come from the very edges of the outer solar system. Comets may be as old as 4.6 billion years old, forming at the same time as Jupiter, Saturn, Uranus and Neptune. Some scientists speculate comets may be more than 4.6 billion years old – older than our solar system. Whatever their age, comets are frozen time capsules containing information about the very beginnings of our solar system, and may be responsible for delivering organic molecules – the building blocks of life – to Earth.

Where do they come from?

Comets come from two regions in the outer solar system: the Kuiper Belt (home to Pluto) and the Oort Cloud. The two billion mile-wide Kuiper Belt lies in the plane of our solar system and begins just past the orbit of Neptune. Halley's Comet comes from the Kuiper Belt. The Oort Cloud, a sphere of icy bodies that surrounds the solar system, is not well understood due to its extreme distance from the Earth and the rest of the planets. Though comets usually stay in these regions, they are occasionally “pulled” in towards the inner solar system by gravity.

Comet Siding Spring

Comet Siding Spring is a visitor from the Oort Cloud. It will pass close to Mars, coming within 82,000 miles (132,000 km) of the Red Planet at 2:28 P.M. Eastern Time on October 19, 2014. That does not seem very close, but consider that if Comet Siding Spring was to pass that close to Earth, it would be three times closer to the Earth than the Moon! When Comet Siding Spring was first discovered on January 3, 2013, scientists predicted there was a chance the comet could collide with Mars. After making more observations as Comet Siding Spring has come closer, scientists now do not expect it will collide with Mars. However, all of NASA's spacecraft operating at Mars will monitor Comet Siding Spring and the interaction of its dust with the planet's atmosphere to learn more about these infrequent visitors to our inner solar system.

Upcoming Events

Find information and resources about upcoming celestial events and NASA mission milestones to share with your child at http://www.lpi.usra.edu/education/look_up.

comets



Do Science at Home with Comets!

Why explore science with your child?

- Children are naturally curious about their world and science encourages continued curiosity and a deeper appreciation for nature.
- Science helps children develop critical thinking skills that can help them perform better in school, have more diverse job opportunities, and become better informed consumers and citizens.
- Science strengthens communication skills.

You are the most important role model your child has! By actively making science a part of family life, you send the message that science is important. Plus, participating in science doesn't require knowledge of math and science. It only takes curiosity, an interest in learning, talking about it, and having some fun together!

Comet Time!

Use the resources below to explore comets – including Comet Siding Spring and its close encounter with Mars – with your child. Start with some on-hand craft materials and Make a Comet! Celebrate comets and Comet Siding Spring by investigating websites and reading comet books together. See if any events are happening in your neighborhood through your local museum, planetarium, observatory, or astronomical club that you and your family can attend. Finally, watch for news stories to talk about with your child.

Make a Comet

<http://www.lpi.usra.edu/education/explore/comets/activities/makeAcomet.shtml>

In this hands-on activity, children construct their own model of a comet using a variety of art supplies. This introduces your child to the structure of comets and the interactions between comets and our Sun.

For more information on making science part of your family's life, please visit the Try Science program's website at www.tryscience.org/parents/parent.html.

Selected Books

Comets, Meteors, and Asteroids: Voyagers of the Solar System

Ellen Lawrence, Ruby Tuesday Books, 2014, ISBN 978-1909673229

Children ages 4–8 are introduced to space rocks, including asteroids, meteorites, and “space snowballs.”

Exploring Dangers in Space: Asteroids, Space Junk, and More

Buffy Silverman, Learner Publishing Group, Inc., 2012, ISBN 9780761354468

This book discusses space collisions, from the asteroids and comets that strike Earth and other planets to the work scientists are doing to protect our planet. For ages 7–12.

View more book titles at <http://www.lpi.usra.edu/education/explore/comets/resources/books.shtml>.

http://www.lpi.usra.edu/education/look_up



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Websites

Comet Siding Spring at NASA's Mars Exploration Program

<http://mars.nasa.gov/comets/sidingspring/>

About Comets

<http://solarsystem.nasa.gov/planets/profile.cfm?Object=Comets&Display=OverviewLong>

10 Need-to-Know Things About Comets

<http://solarsystem.nasa.gov/planets/profile.cfm?Object=Comets>

Comet Images

<http://solarsystem.nasa.gov/planets/profile.cfm?Object=Comets&Display=Gallery>

Comet Videos

<http://solarsystem.nasa.gov/multimedia/videos.cfm?&Object=Comets>

Comets vs. Asteroids Fact Sheet

http://solarsystem.nasa.gov/planets/docs/Comet_factsheet_4-25-12_b.pdf

Missions to Comets: <http://solarsystem.nasa.gov/missions/profile.cfm?Sort=Target&Target=Comets&Era=Present>

Add a Creative Twist

“The “why” of space exploration is a matter of emotions and instincts... It takes a variety of languages, including, those of art, music, and literature, to teach.”

- Piers Bizony, “The Bigger Pictures”

Ever read a good science-fiction book or watch a futuristic movie like “Star Wars,” “Star Trek,” “Ender’s Game” or “The Time Machine?” Science fiction is storytelling that reflects scientific thought and foresees and communicates a future based on the reality of today. Literature, movies, music and works of visual art all have the power to communicate an idea and elicit emotion from an audience.

Encourage your child to create an artistic interpretation of the Comet Siding Spring encounter with Mars!

A Comet Encounter

Jacqueline Moliner is an avid science fan and professional artist. Her enthusiasm for all things Space inspires her to research the science behind celestial events and create her Cosmic Funnies series. This combination of art with science is a great example of a fun way she shares her passion with others. *A Comet Encounter* was motivated by Comet Siding Spring’s close encounter with Mars.

You can see more of the Cosmic Funnies and follow Jacqueline’s other work at <http://cosmicfunnies.tumblr.com/>

