

A Star in the East



In the Christmas story, a group of **magi** (MAY-jie), or wise men, followed a bright star to find the Christ child.

Magi were early **astronomers***. They recognized the positions of all the stars. When a new star appeared in the sky, they knew it.

They also believed in **astrology** (uh-STRAW-luh-jee), or the idea that the positions of the stars affect people's lives. Scientists no longer believe this.

When the magi saw a new star appear in the eastern sky, they believed it was a symbol that a new leader of the Jewish people had been born.

Astronomers' ideas

For hundreds of years, astronomers have been trying to figure out an explanation for the Christmas star. No one knows for sure what it was.

Part of the difficulty in answering this question is that no one knows exactly when the magi went on their journey.

The top scientific explanations for the star include:

- a supernova
- a comet
- several planets coming so close to each other that they seemed like one bright star.

* An astronomer is a scientist who studies heavenly bodies, such as planets and stars.

Mini Fact:

Some experts believe the magi could have seen a comet around 3 or 4 B.C.

Stars and supernovas

A **star** is a giant ball of gas. It stays together because different forces are in balance.

Nuclear explosions from inside the star push out. At the same time, the **mass**, or weight, of the star pushes in. The two forces balance each other.

When the star grows old, it starts running out of nuclear fuel. It stops creating as many explosions.

With less force pushing out but the same gravity pulling in, the star begins to collapse.

The pressure of the collapsing star heats up the core of the star to about 100 billion degrees Fahrenheit. Finally, it becomes so hot, it blows up. The exploding burst of light can appear as a super-bright star in the sky, or **supernova**.

Supernova fireworks

When a star explodes, it creates shock waves of glowing gas spreading out into space. We can still see the glowing remains of supernovas from star explosions millions of years ago. Sometimes they're so bright that people on Earth can see them with the naked eye.



This painting by Giotto di Bondone shows the Christmas star as a comet over the Christ child. Di Bondone painted it in 1303. He had seen an appearance of Halley's comet in 1301.

Comets

Comets (KOM-ihts) are balls of ice, rock and dust orbiting the sun. Scientists believe they were formed when planets and the sun were born about 4.6 billion years ago.

When a comet orbits near the sun, some of its ice melts and becomes gas. The gas and dust become the comet's tail. The gas forms a cloud surrounding the comet.

Sunlight reflects off the gas and dust, making the comet shine. Comet gases

also glow on their own. If the comet comes close enough and glows brightly enough, we can see it from Earth.

Planets

Planets travel in regular orbits around the sun. We can see some of them moving across the night skies.

The orbits of Jupiter, Saturn and Mars brought them close together in about 7 B.C. From Earth, this group of planets could have looked like one giant shining star.

There was another grouping of planets about 3 or 4 B.C., but it might not have been as visible.

However, the magi, who studied star patterns, would have known it was there. They might have believed it was a sign.

Resources

On the Web:

- spaceplace.nasa.gov/supernova/en/

At the library:

- "50 Things To See With a Telescope — Kids" by John A. Read



Try 'n' Find

Words that remind us of the Christmas star are hidden in this puzzle. Some words are hidden backward or diagonally, and some letters are used twice. See if you can find:

ASTROLOGY,
ASTRONOMER, CHILD,
CHRISTMAS, COLLAPSE,
COMET, EARTH, EAST,
GAS, GRAVITY, ICE,
MAGI, MASS, NUCLEAR,
ORBIT, PLANET, STAR,
SUPERNOVA, SYMBOL,
TAIL.

G T T F V T E N A L P I F E Y
Q E C I A S T R O N O M E R G
J B O K B Y T B C H I L D Z O
N H L L B R M J S S A M D S L
U T L I T Y O D T E M O C J O
C R A A S K K T N S I G A M R
L A P T A A V O N R E P U S T
E E S S E L R A T S R N X K S
A T E N Y T I V A R G G A S A
R S A M T S I R H C O W N R Z



Cook's Corner

Holiday Gift Cookies

You'll need:

- 1 box yellow cake mix
- 1/2 cup flour
- 1/3 cup canola oil
- 2 eggs
- 1 (4-ounce) container of applesauce

What to do:

1. Mix and blend well all ingredients in a large bowl except for chocolate chips and pecans.
2. Gently stir in chips and pecans.
3. Place teaspoonfuls of dough 2 inches apart on an ungreased baking sheet.
4. Bake at 350 degrees for 12 to 14 minutes.
4. Allow to cool. Place 10 to 12 cookies on a small decorative plate and cover with colored cellophane. Tie with a bright ribbon. Makes about 3 dozen cookies.



* You'll need an adult's help with this recipe.

ROOTONYM®

by Jan & Carey Orr Cook



Study the definition. When you know the missing word, fill in the letter boxes and the sentence blanks.

1. A heavenly body seen in the dark sky (4-letter noun)

□ □ □ □

2. To have a bright, glowing appearance (5-letter verb)

□ □ □ □ □

3. Burst due to pressure or force inside (7-letter verb)

□ □ □ □ □ □ □

4. To identify or to know from an earlier experience (9-letter verb)

□ □ □ □ □ □ □ □ □

1. Ralph made a wish on a _____ very high above his head.
2. Melanie clearly saw the moon _____ on the stone path.
3. Hank's balloon can _____ if he blows too much air inside.
4. Juanita will _____ her aunt since she studied her photo.

Mini Jokes

Sonja: Which is lighter, the sun or the Earth?

Sam: The sun! It rises every morning!

Eco Note

Humanity's widespread use of artificial light is affecting the world's animals and plants, and researchers say it should be limited where possible. Scientists from the University of Exeter in the United Kingdom say their analysis of more than 100 studies reveals that light pollution causes changes to animal behavior and physiology, especially hormone levels and patterns of waking, sleeping and activity. They say even low levels of artificial light can have big effects.

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For later:

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