

CLASSROOM ACTIVITY

WISE: Focus on Infinity

On September 30, 2010, a NASA space telescope called the Wide-field Infrared Survey Explorer, or WISE, completed its sweeping goal: to record observations of the entire sky in infrared light. The WISE science team is now sifting through the telescope's two million images to spot objects that no astronomer has ever seen before. WISE's most intriguing finds will include mysterious objects called brown dwarfs, blacker-than-coal asteroids, and the Universe's brightest galaxies. All told, WISE's data will yield a new picture of the Universe, from our local region to the remotest reaches, and from the distant past to the present. In this Astro Bulletin, watch the WISE team launch and focus this unique eye on the sky.

CLASS DISCUSSION

Establish Prior Knowledge

Call on students to share what they know about infrared light. If necessary, direct them to this website:

http://www.nasa.gov/audience/forstudents/5-8/features/F_Infrared_Light_5-8.html

Explain that many objects in the Universe emit infrared light, which is outside the visible spectrum. A NASA space telescope, The Wide-field Infrared Survey Explorer (WISE) is able to detect infrared light. The data WISE captures will yield a new picture of the Universe from regions around our solar system to the remotest reaches of the Universe.

Exploration

Before watching the feature have students read the synopsis. As they watch they should take notes about the data WISE will collect. After viewing, use the following questions to guide a class discussion.

- What is the goal of WISE? (*Answer: The goal of WISE is to record the entire sky in infrared light.*)
- How does WISE differ from the Infrared Astronomical Satellite? (*Answer: The IRS had only 62 pixels, WISE has 4 million pixels. It can therefore provide a more complete survey.*)
- What kinds of objects will WISE detect? (*Answer: WISE will pick up the infrared glow of hundreds of millions of objects. It will detect objects never seen before, including the coolest stars, planets, Ultra-luminous galaxies and some of the darkest near-Earth objects and asteroids.*)
- What are some of the things scientists hope to learn from the data? (*Answer: They hope to learn the number and location of near-Earth asteroids, the star closest to the Earth, and the origin of planets, stars and galaxies. They are also confident that WISE will detect objects that were previously unknown.*)

Wrap-Up

Use this question to wrap-up the discussion:

- How can WISE give scientists a picture of the early Universe? (*Answer: Ultra-luminous galaxies emit more infrared wavelengths than galaxies in the Milky Way. Light from these distant galaxies takes ten to twelve billion years to reach Earth. WISE detects infrared wavelengths and sees the galaxies, as they were billions of years ago when they were still forming.*)

Extend

Students who wish to learn more about WISE and what it has detected can visit this NASA website.

http://www.nasa.gov/mission_pages/WISE/news/index.html