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U.S. Kavli Frontiers of Science

19th Annual Kavli Frontiers of Science Symposium

U.S. National Academy of Sciences
Arnold and Mabel Beckman Center
November 8-10, 2007
Irvine, CA

Seeing Dark Energy

[-Presentation](#)

Adam Riess, John Hopkins University and Space Telescope Science Institute

Please click on the above link to watch the presentation - both slides and audio. This presentation file is in [Adobe Flash player](#) format, available free online.

What is dark energy?

Dark energy is believed to be a component of the Universe whose repulsive gravity is presently accelerating the expansion of the Universe. Although it comprises the bulk of the mass-energy of the Universe, its nature is not well understood. Albert Einstein originally suggested its existence about 80 years ago.

What is a supernova, and why is it an important tool in gauging the universe's behavior?

A supernova is the explosive death of a star, which unleashes a burst of light through the cosmos. These violent deaths occur once every 100 years in a typical spiral galaxy like our Milky Way. Some astronomers call some types of supernovas nature's "60-watt light bulbs" because they burn at nearly the same brightness. By measuring their predictable light output, astronomers can estimate how far they are from Earth. Many of them are billions of years away. But supernovas blaze so brightly that they can be seen far across space. That's why some astronomers also call them "cosmic mile markers": their light provides important information about the universe's behavior. Supernovas illuminate the dark corners of space, allowing astronomers to map the history of the universe's expansion. How was the discovery of dark energy made?

Two teams of scientists measured about 100 supernovae to gauge changes in the expansion rate. They expected to find the expansion rate to be

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slowing down, but were stunned to find it speeding up!

Link: <http://www-int.stsci.edu/~ariess/index.htm>

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