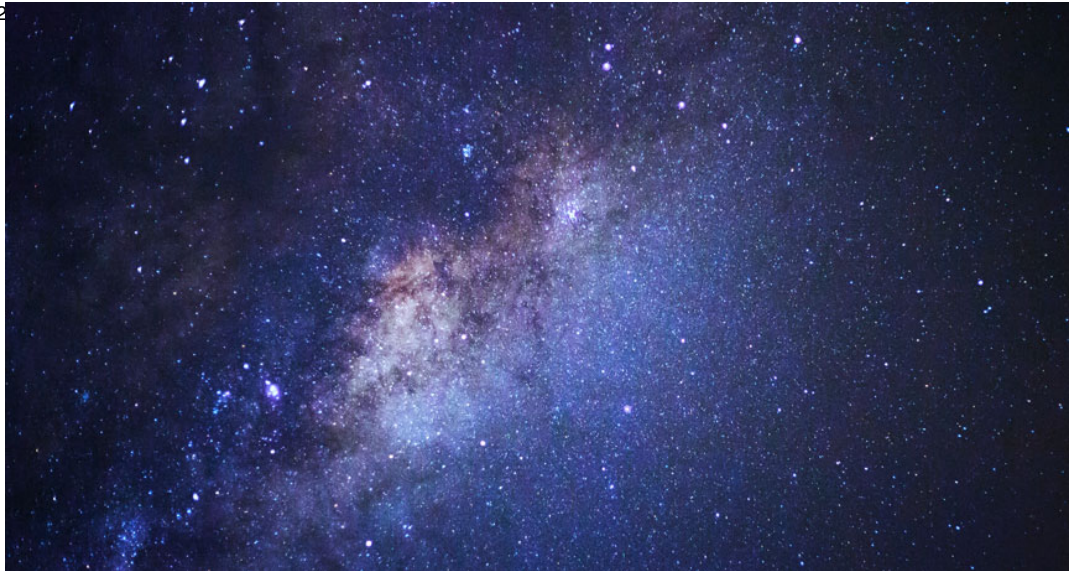


News in Brief: Physics,Astronomy

Supernovas show the universe expands at the same rate in all directions

An analysis of exploding stars reveals the universe's symmetry

By Emily Conover 7:00am, February 22, 2019



STRETCH OUT The universe is expanding at the same rate no matter what direction you look, a new study of supernovas finds.

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The cosmos doesn't care whether you're looking up or down, left or right: In all directions, the universe is expanding at the same clip. When compared across large swaths of the sky, [expansion rates agree to better than 1 percent](#), researchers report in a paper in press in *Physical Review Letters*.

Observations of exploding stars, or supernovas, indicate that the universe is not only expanding, but that expansion is [accelerating](#) over time (*SN Online*: 1/16/18).

To check if that expansion proceeds apace in different parts of the sky, the scientists studied more than 1,000 exploding stars called type Ia supernovas, which detonate with a known brightness. By measuring how much the supernovas' light is stretched as space expands, researchers can estimate how fast the universe spreads out, and see if the data differ from what would be expected for a uniform expansion.

Even in a perfectly evenly expanding universe, there's bound to be a bit of noise — a sort of random jitter — in the data. Previous analyses have relied on computer simulations to estimate the expected noise. But "it's a real pain to get simulations to have all the right bells and whistles" necessary for fully reliable results, says theoretical cosmologist Dragan Huterer of the University of Michigan in Ann Arbor. So Huterer and colleagues instead used a scrambled version of the supernova data to gauge how much noise to expect, a technique Huterer says is more reliable.

The results confirm cosmologists' understanding of the universe. According to the theory of inflation, the universe [expanded extremely rapidly](#) just after the Big Bang (*SN*: 7/28/12, p.20). That expansion is thought to have proceeded equally in all directions, setting up the universe's uniform spreading today.

Citations

J. Soltis *et al.* [Percent-level test of isotropic expansion using type Ia supernovae](#). *Physical Review Letters*. In press, 2019.

Further Reading

T. Siegfried. [Speed of universe's expansion remains elusive](#). *Science News Online*. January 16, 2018.

E. Conover. [Debate accelerates on universe's expansion speed](#). *Science News*. Vol. 190, August 6, 2016, p. 10.

A. Grant. [Speed of early universe's expansion determined](#). *Science News Online*. April 9, 2014.

A. Witze. [Inflation on Trial](#). *Science News*. Vol. 182, July 28, 2012, p. 20.

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