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A Few Starry and Universal Truths

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Strong signs that the expanding universe is actually starting to speed up come from astronomers using ground-based and orbiting telescopes to chart supernova exploding stars in galaxies, a gauge of how fast the universe has expanded so far. Says Saul Perlmutter of the Lawrence Berkeley Laboratory, a leader of the effort: "No big crunch. The galaxies out there seem to be accelerating outward. Not much, but they are not turning around either."

If so, even gravity, weakened over distances spanning a universe, is surrendering to some other deep phenomenon, perhaps embedded in the vacuum itself, pushing apart the fabric of space. This may give the ghost of Albert Einstein solace. He invented a term in his equations of general relativity to prevent the universe from collapsing and called it the cosmological constant. He later called it his greatest mistake. Subsequent discovery that the universe is expanding seemed to render it unnecessary. Now, the cosmological constant appears real anyway. Gravity held it at bay for a while, but over the breadth of the universe, "it will eventually win. The universe must eventually accelerate, faster and faster to infinity," says David Spergel, professor of theoretical cosmology at Princeton.

[Photo captions] 1. To find the infrared starlight accumulated in the universe, astronomers, using images from the orbiting COBE satellite, started with a picture of the entire sky. 2. Then they subtracted light from solar system dust, shown in blue, and took out, as much as possible, the glow from Milky Way galaxy dust. 3. What was left is the infrared signature of all the stars everywhere else. It is about twice what they expected.

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