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A universe without

dark energy

[Note: This item comes from reader Randall. DLH]

From: Randall

<rvh40@insightbb.com>

Date: August 29, 2009 7:36:20 PM PDT

To: Dewayne Hendricks

<dewayne@warpspeed.com>

<<http://www.pnas.org/content/106/34/14181>>

A universe without dark energy

Astronomers have observed that galaxies within our universe have a redshift that is unaccounted for by the Standard Model of Cosmology—galaxies continue to accelerate as they move away from each other.

Cosmologists have rectified this anomalous acceleration by introducing the concept of dark energy, which is proposed to permeate space, propel matter, and account for nearly 75% of the mass–energy in our universe. This explanation, however, requires use of the speculative “cosmological constant” to Einstein’s equations of general relativity; dark energy is the physical interpretation of the cosmological constant in the Standard Model. Blake Temple and Joel Smoller derived a model of expanding wave solutions of the

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Einstein equations that could account for the observed acceleration of the galaxies without relying on dark energy or the cosmological constant. The equations give rise to an explicit, one-parameter family of expanding spacetime-waves that speed up or slow down the universe's expansion rate relative to the Standard Model, according to the value of the free parameter. The authors suggest that these expanding waves could emerge in time from the initial disturbance of the Big Bang and propel matter in a manner similar to dark energy. — F.A.

“Expanding wave solutions of the Einstein equations that induce an anomalous acceleration into the Standard Model of Cosmology” by Blake Temple and Joel Smoller (see pages 14213–14218)

<<http://www.pnas.org/lookup/volpage/106/142>

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