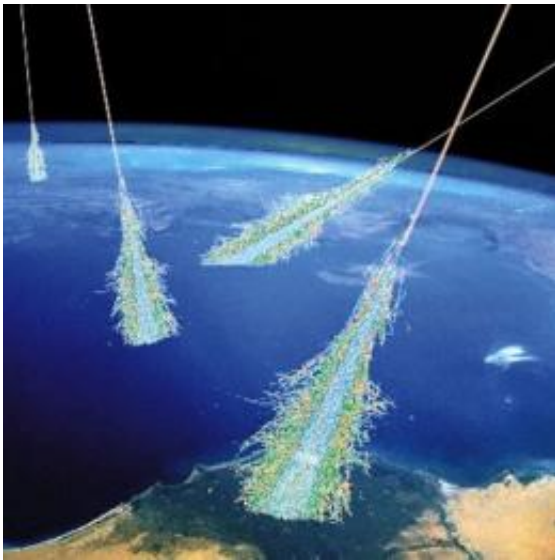


# Scientists Prove Cosmic Rays Are Made of Protons

July 1 2010, By Phillip F. Schewe

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Cosmic rays, originating outside our Milky Way galaxy, slam into our atmosphere, where they set up a shower of secondary particles. Credit: NASA

Cosmic rays are made of protons, scientists found as they used a vast array of telescopes arranged across the Utah desert. Each telescope in the 67-unit arrangement sees the sky with a multifaceted eye. It's no wonder they call it Fly's Eye.

Scientists at the High Resolution Fly's Eye detector, nicknamed HiRes, in the Army's Dugway Proving Grounds in Utah, determined that the positively-charged components found in the center of each atom are

what make up cosmic rays. Previously they had not been sure that the high-energy rays hadn't been something heavier, such as the nucleus of an iron atom.

Cosmic rays, originating outside our [Milky Way](#) galaxy, slam into our atmosphere, where they set up a shower of secondary particles. These particles cause nitrogen molecules in the air to glow slightly. The energy of the glow is recorded in sensitive photo-detectors attached to the telescopes. The particles made a conical pattern and deposited a characteristic energy spray in the detectors.

Cosmic rays have energies that can be much higher than anything produced by physicists. HiRes looks at the composition of [cosmic rays](#) with energies a million times greater than those generated on Earth, such as in the accelerator at the [Large Hadron Collider](#).

The HiRes detector can even determine the direction of the incoming cosmic ray. John Belz, a team member from the University of Utah, says that setting two sets of telescopes provides the stereo "seeing" needed to trace the cosmic ray's incoming trajectory. The two arrays, each covering several acres, stand about 7 miles apart. The ray's origin can be pinpointed to a region about as big as the full moon.

The experimenters logged data for several years between May 1997 and April 2006 and recently published their work in the journal [Physical Review Letters](#).

Provided by Inside Science News Service

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