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Who Cares if Neutrinos Have Mass?

By JERRY SCHWARTZ, AP National Writer

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NEW YORK--On Thursday, Terry Nichols was sentenced to life for the Oklahoma City bombing. The House failed to pass a school prayer amendment. Kenneth Starr endured a Supreme Court setback. And, oh yes, 120 physicists declared that a tiny subatomic particle -something no man or woman has ever seen or felt -had mass.

"Universe May Never Be the Same," declared The New York Times across the top of its front page Friday.

This may have been a slight exaggeration.

For sure, the **neutrino** news out of the Super-Kamiokande project altered scientists' perception of the universe, as did other, recent discoveries concerning its size and expansion and age.

But the universe is the same old universe that has been around for 15 billion years (or whatever). And the breakthrough did not seem to make much of an impact on more than a few citizens of this world.

They went about their business. They ate their Quarter Pounders with Cheese; they listened to their classic, five-member Spice Girls records. But they did not give more than a passing thought to the news that **neutrinos** have mass, or weight.

They were not as excited as Eric Linder, senior research associate with the Department of Physics and Astronomy at the University of Massachusetts. When he heard the news -he received a news release three days in advance -he e-mailed his physicist friends.

"It's always exciting when there's a new discovery, when we answer some of the questions," Linder says.

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The existence of **neutrinos** was first suggested in 1930. They float through the universe; they are far too small to be seen, and they have no charge, so they pass through things -they pass through just about anything -without having any effect.
The Super-Kamiokande team found that **neutrinos** "oscillate," or change. If they change, they have mass. Scientists have theorized that planets, stars and other known bodies account for only 10 percent of the universe’s mass; if **neutrinos** have mass, they constitute a little or a lot or most of the rest.
What does that mean? Well, if there is enough mass, it is believed that the universe will contract and eventually collapse.
This doesn’t sound good, but it should be noted that this is not likely for billions of years. Which would be long after our sun burns out. Which in turn is unlikely until long after humans are extinct.
"It won’t affect your investment portfolio," says Rocky Kolb, cosmologist at the Fermi National Accelerator Laboratory in Batavia, Ill.
Kolb doesn’t want to oversell the **neutrino** story.
"It’s not as crucial as the breakup of the Spice Girls," he jokes. "It’s not going to cure male pattern baldness. It’s not going to have the impact of Viagra."
He understands that to the lay person, discoveries are coming "at a bewildering pace." But it is an exciting time to be a physicist, perhaps the dawn of a new kind of particle physics.
And he would argue that "reflective, educated people should have some knowledge of the nature surrounding them." Physicists are to the 1990s what Columbus was to the 1490s -men and women who fulfill "our longing for exploration and understanding."
Still, says Linder, most people "don’t care about these little things in atoms. ... Most of us are just locked away in our offices, and we’re completely thrilled when a student comes by and asks us what we’re doing."
Science writer Donald Goldsmith says the **neutrino** is beyond most people. "They should start with the Earth circling around the sun, which many of them haven’t mastered."
According to a colleague of Kolb’s, Bob Higgins, there have been a number of proposals for practical uses for **neutrinos**. They could be used to take the equivalent of a CT scan of the earth, looking for oil or other resources. They could be used for communication.
But no one knows if these things could ever come to pass.

There is little expectation that the search for **neutrinos** will bring us anything like Velcro or Teflon, products of the space program.
Instead, it may bring us answers to big questions -questions that are in themselves miraculous.
"The most amazing thing is that on a small planet that circles a medium-sized star, a species has developed that can ask these enormous questions," says Kolb.
Or, as Higgins likes to quote Albert Einstein, "The most incomprehensible thing about the universe is that it is comprehensible."
