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### High energy propels Fermilab scientist

[Chicago Sun-Times](#), [Mar 14, 2003](#)

JOCELYN MONROE

AGE: 25

What she does: She's part of a team of 60 Fermilab researchers on a quest to prove the existence of a new subatomic particle.

What she says about it: "You just kind of have to have faith that increasing the sum total of human knowledge ... will somehow end up being useful."

What she wants: To help discover the sterile neutrino.

Searching for one of the tiniest particles in the universe is a big job. Especially since there's no proof it actually exists.

But Jocelyn Monroe, a 25-year-old doctoral student working on a team involved in that quest at Fermilab near Batavia, wouldn't want to be doing anything else.

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"It could indicate the existence of a new particle," says Monroe, who is doing research at the far-west suburban lab to obtain her doctorate in high-energy physics. "That would be huge. I love what I'm doing."

The Hyde Park native is part of a team of scientists in the midst of a nearly three-year search for a new type of neutrino, an elusive subatomic particle that travels at almost speed of light but leaves virtually no trace of its passage. The \$19 million MiniBooNE project is trying to confirm what would be the existence of a fourth type of neutrino, called a sterile neutrino.

Neutrinos are the phantoms of the subatomic world, despite being so numerous that scientists calculate that there are about 10 million of them per cubic foot. The particles come

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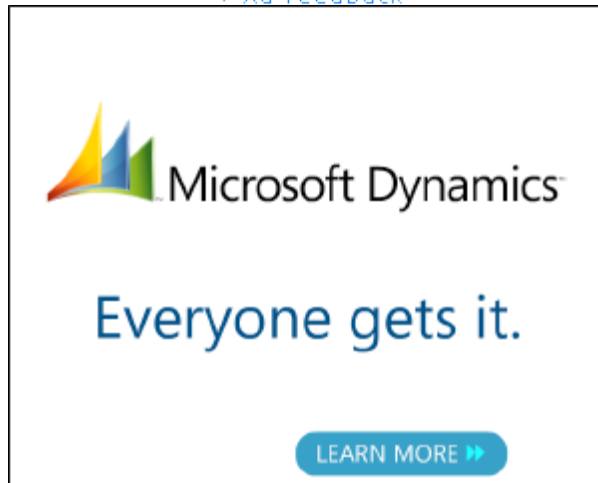
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from the sun and other celestial objects and could help explain the composition of the universe, but are detected only when they collide with other subatomic matter.

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Monroe's work includes monitoring computers tracking the experiment from the 10th-floor control room at Wilson Hall, Fermilab's headquarters. Sometimes, that involves hands-on work such as checking electrical connections inside the buried bunker that houses a 40-foot-tall sphere filled with thousands of electrical receptors and 100,000 gallons of mineral oil that help scientists track the particle collisions, which create a tiny spark of energy. Other times, it's helping to analyze reams of data.

"You have to do a million different jobs," says Monroe. "That combination really appeals to me."

Her friends and family have learned to accept that, though it's hard at times for Monroe to explain to them why she gets so enthused about such abstract research. It's impossible to predict where the research some day will lead, but Monroe points out that earlier research into quantum mechanics ultimately led to the development of computers.

"I know what we do is pretty abstract," she says, shrugging. "You just kind of have to have faith that increasing the sum total of human knowledge about the fundamental building blocks of the universe will somehow end up being useful."

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