

Researcher's formula breaks new ground

Cooper Tire's Will Mars advances predictions of tire durability

By **MIKE SOBCZYK**
STAFF WRITER

In his field of work, Will Mars, an advanced research engineer at Findlay's Cooper Tire & Rubber Co., is considered one of the rubber industry's experts.

But to his 7-year-old daughter Anna, he's just the "crack doctor."

And that's fine with the 32-year-old Mars, who doesn't mind the moniker his daughter has given him one bit.

Thanks to Mars' recent development of a formula — never achieved before — for "cracking energy density," Cooper tire designers and engineers can now predict tire durability better.

"The whole problem of predicting the fatigue life of rubber (when a crack appears and begins to grow) is of interest to those who make rubber products," Mars said when asked about the significance of his discovery.

In simplest terms, cracking energy density predicts the rate of growth of a crack in rubber when it's stretched in various ways. "The approach is pretty novel," Mars said recently from Cooper Tire's Technical Center. "In real life, there are six different ways to stretch something."

And that's what makes Mars' formula unique. It works when rubber is stretched simultaneously in many different directions, something not achieved before.

"We've been pretty pleased with the results of how our (computer) predictions actually

work with road tests," said Dave Dryden, Cooper's manager of research and technology. The company already has incorporated Mars' formula into software that uses the concept to help predict tire durability.

A patent on the software is being sought.

Dryden noted that prior to Mars' discovery, "We could tell where a tire would develop tire fatigue, but not when. But now this is predictive. We can now show how many miles until there is a crack initiation."

Dryden said Mars, who started at Cooper Tire as a co-op student in 1992, had been asked by company personnel to look at solving this problem. "He had a hunch how to do it," Dryden said.

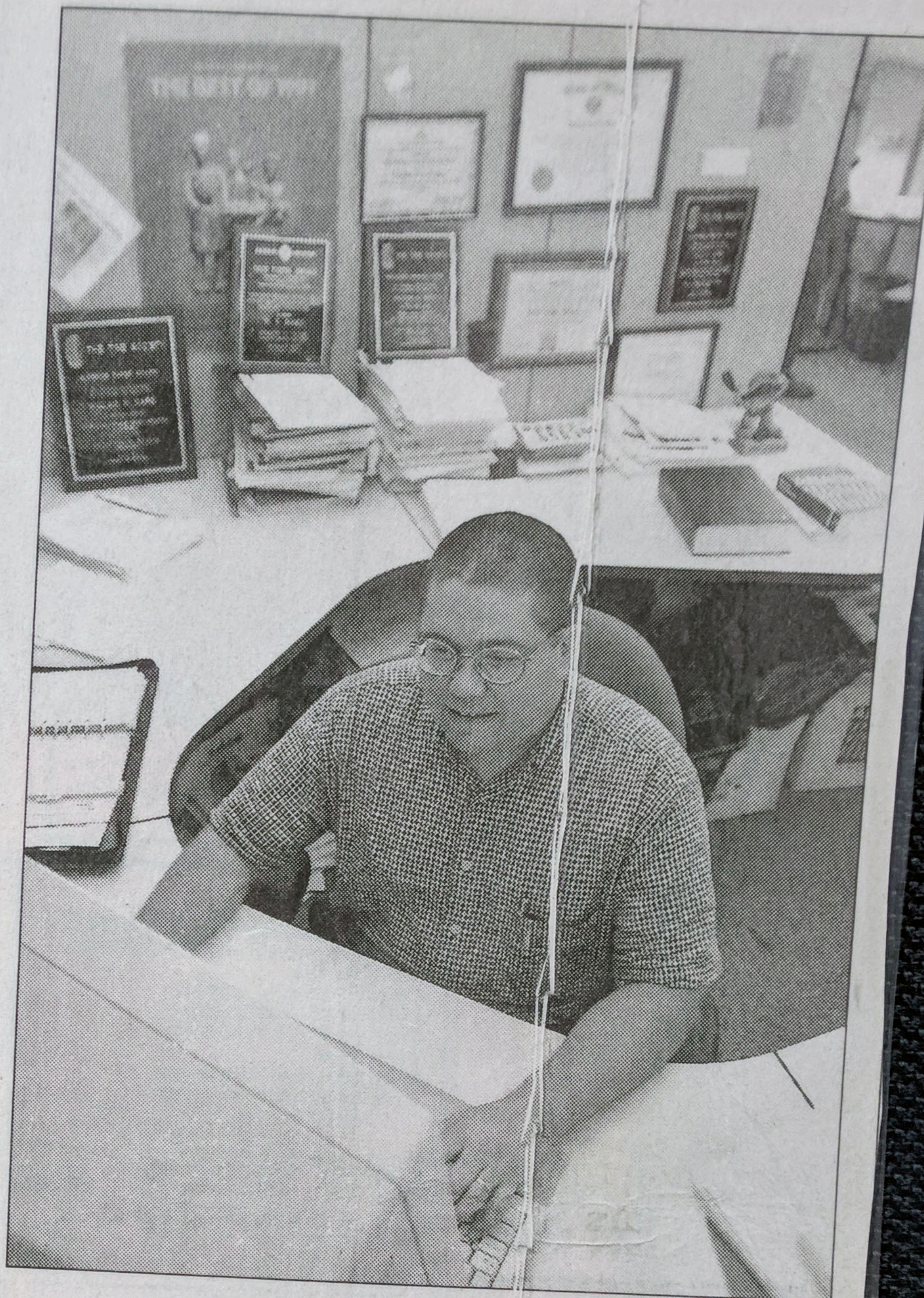
What followed for Mars was a lot of stops and starts and a lot of work.

"Between two-thirds or three-fourths of my time for the past two years at Cooper has been spent working on this project," Mars said.

He explained that he worked on the problem of predicting the fatigue life of rubber for two years before he started his doctoral dissertation on cracking energy density. Mars will formally receive his doctorate degree in engineering science from the University of Toledo this month.

"Part of my dissertation," Mars said, "was verifying what I had discovered."

But all that effort apparently has paid off.



RANDY ROBERTS / The Courier

ADVANCED RESEARCH ENGINEER Will Mars at work at Findlay's Cooper Tire & Rubber Co. He has developed a formula that helps Cooper's tire designers and engineers to better predict tire durability.

In recent months, Mars had been awarded a "Superior Paper Award" from The Tire Society and the "Best Paper-Original Contribution Award" from the American Chemical Society Rubber Division. Cracking energy density and tire fatigue were the topics of both papers.

Dryden said the American Chemical Society Rubber Division award "is like the Emmys, you know who you're competing against."

Mars said that at the conference where he presented the paper, "I was probably the only unknown ... there were some pretty heavy hitters." Between 100 and 120 papers were pres-

ented at the conference.

Mars, who earned his bachelor of science degree in mechanical engineering from the University of Akron in 1994, received a master's degree in mechanical engineering in 1999 from the University of Toledo.

With his doctoral achievement, Mars may now be known as "Dr. Mars" to many. But to his 7-year-old daughter, he still will be called the "crack doctor."

In addition to Anna, Mars and his wife, Linda, have two other children.

Phone: (419) 427-8421
mikesobczyk@thecourier.com