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**Device captures laser flashes
Henrietta company's streak camera produces data-filled images.**

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When the Omega laser fires at the University of Rochester's Laboratory of Laser Energetics, it can heat a target to 100 million degrees Celsius.

Omega's laser pulse can last just a billionth of a second.

In spite of these extreme conditions, scientists need to collect as much information as possible about the intensity, duration and shape of a laser pulse and the reaction it causes.

Two UR researchers have designed an instrument that captures more data with greater precision than current devices, according to recent assessments. The university has licensed the technology to a new company that plans to make the instruments locally and sell them for as much as \$375,000 each.

"This is a breakthrough invention," said Michael Pavia, president of Sydor Instruments in Henrietta. "This will become the technology used for the next 30 years."

The company is negotiating its first orders for delivery next year, he said. With interest from laser facilities in the United States, France and other countries, Sydor Instruments expects to sell 100 units in the next four to seven years.

If demand meets expectations, the company, which currently has four employees, could hire as many as 30 engineers and technicians in the next three to five years for jobs that could pay from \$45,000 to \$80,000 annually, Pavia said.

"We have great science and technology in this community and we need to get it out there and take advantage of it more," he said.

The instrument, called the Rochester Optical Streak System, is a high-speed camera that captures powerful flashes of light in billionths of a second and, instead of producing an image, turns it into data and useful information about the time and brightness of the flash for various colors of light.

In addition to research on laser fusion, scientists could use the streak system to make accurate measurements of very fast light in other fields, including chemical reactions and fiber optic communications.

"The ROSS represents a significant milestone in the evolution of streak cameras," said Richard Lerche, a scientist at Lawrence Livermore National Laboratory in California, who has evaluated the instrument.

Two UR laser lab scientists, Robert Boni and Paul A. Jaanimagi, designed the system and patented its calibration technology, which helps give the system its high accuracy.

Current instruments can be 10 percent to 20 percent off. The new system, which is about the size of a microwave oven, is accurate within 1 percent or less, said Boni, a research engineer at UR's laser lab.

Current instruments require extensive calibration that can take weeks or months. The ROSS is self-calibrating.

"Calibration is simple, quick and self-contained and can be done in 30 minutes," said Jaanimagi, a senior scientist at the laser lab.

Lerche called the ROSS twice as good as current instruments.

"You can now make out features that are one-half the size of what could be seen before," he said in an e-mail.

The instrument is able to "see" more individual laser beams simultaneously and record more events at the same time, Boni said.

Sydor Instruments is a privately held company. James Sydor, president of Sydor Optics in Rochester, is chief executive and the primary investor in the company.

Sydor Instruments engineers worked with the inventors at the UR laser lab to develop a step-by-step guide to its assembly and testing requirements.

"It is a model of technology transfer," Pavia said.

In the future, Sydor Instruments hopes to commercialize additional technology from UR's laser lab and other facilities.

The company plans to buy as much material locally as possible for use in the ROSS, though some items will be imported from the United Kingdom and France.

Pavia calls the ROSS "the Ferrari of streak cameras." It will cost as much as \$100,000 more than current instruments, but he says it outperforms current devices. "It makes measurements that never have been made this accurately before," Pavia said. "It had to be invented."