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moments of discovery

Wayne State has been the training ground for many inventors and innovators

Emmett Leith

CLAS '50, M.CLAS '52, Ph.D. '78

co-inventor of the 3-D hologram

Today we take 3-D holograms for granted — they are implanted on the surface of credit cards and some foreign currencies and used in a wide variety of industrial applications. But when 3-D holograms were invented in the 1960s, they were a curiosity and source of amazement.

Emmett Leith, the 3-D hologram's co-inventor, recounted the scene when a 3-D hologram was shown at a conference of the Optical Society in 1964. People rushed into the conference and lined up to see a sample hologram — a realistic three-dimensional image of a toy train.

"Most of them thought it was done with mirrors," says Leith, CLAS '50, M.CLAS '52, Ph.D. '78, a professor of engineering and computer science at the University of Michigan. "A few wanted to know where the train was. I said, 'It's back in Ann Arbor.'"

The hologram had been around for years based on the work British scientist Dennis Gabor, who coined the term and won the Nobel Prize for the discovery. But Gabor's holograms lacked depth and clarity. Leith and colleague Juris Upatnieks turned the hologram into the three-dimensional image we know today. They employed lasers to bring holograms to life and make them far more useful.

In 1979, President Jimmy Carter recognized the achievement, awarding Leith the National Medal of Science, the highest award given for American Science.

— *Doug McInnis*

Sultana Nahar

M.CLAS '82, Ph.D. '87

finding a cancer treatment in space

Radiation is a front-line cancer treatment because it's effective at killing cancer cells. But radiation treatments also damage surrounding healthy tissue, so specialists have long sought a more precise way to administer the treatments. Now astronomer Sultana Nahar, M.CLAS '82, Ph.D. '87, and her colleagues may have found a solution — in outer space.

Nahar, a research astronomer at Ohio State University, and colleague Anil Pradhan observed the interaction of X-rays and heavy metals in space. When X-rays hit heavy metals such as iron, they knock loose a small stream of low-intensity electrons.

The pair worked with radiation oncologist Yan Yu of Thomas Jefferson University Medical College. The three concluded that they could duplicate the process by strategically implanting nanoparticles of gold or platinum (both heavy metals) in a cancer, then hitting the cancer with a less-intensive dose of X-rays than is usually used. When electrons are