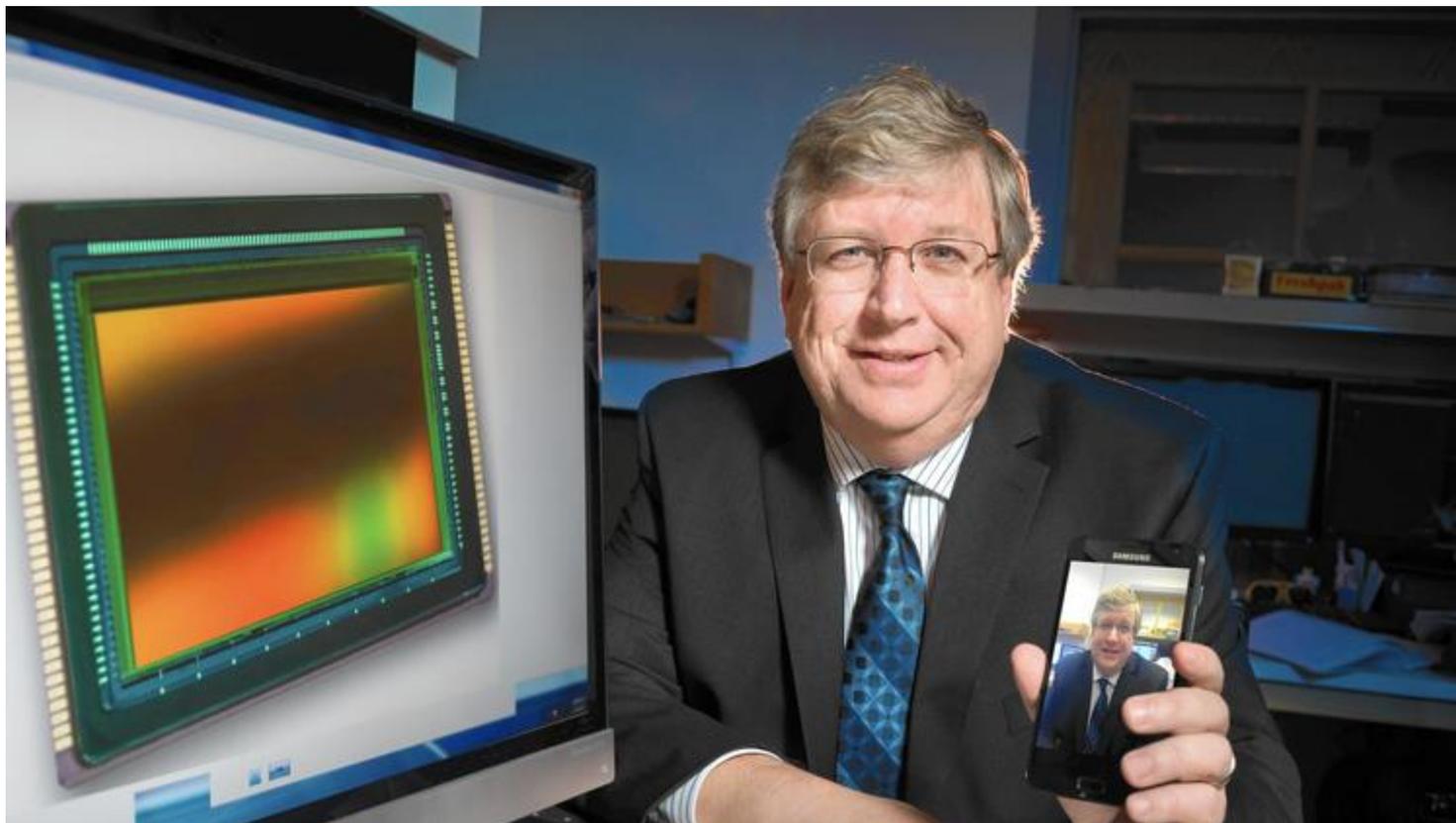


Simsbury Native Wins Prestigious Engineering Prize For Digital Camera Technology



Eric Fossum, a graduate of Simsbury High School, recently was awarded the Queen Elizabeth Prize for Engineering for his invention of image sensor technology that is found in digital cameras. (John Sherman/Contributed Photo)



By **Michael Walsh**
Staff Writer

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A Simsbury native won the most prestigious prize in the field of engineering, for his invention of image sensor technology found in every digital camera.

Eric Fossum, a Simsbury High School graduate, first became passionate about science and technology while attending weekend programs at the Talcott Mountain Science Center, in Avon, when he was in the seventh grade, he said.

It's an experience, he said, that laid the path to his career in engineering which has led to the **Queen Elizabeth Prize for Engineering**, created by the Royal Academy of Engineering, that he was awarded this year.

"It was a very hands-on activity studying science," Fossum, who is 59 and now lives in New Hampshire, while teaching at the Thayer School of Engineering at [Dartmouth College](#). "It's so interesting to learn about how the world works around you at that age especially. It involved math and it was probably the first time I used math for anything that was practical."

After completing his undergraduate degree at Trinity College, where he is a trustee, and his Ph.D at [Yale University](#), he started teaching at [Columbia University](#).

Later, he was recruited by the [NASA](#) Jet Propulsion Laboratory, fulfilling one of his dreams.

"I always wanted to work in the space program," Fossum said. "Since I was an expert in digital camera technology, they asked me to work on solving problems with the technology that was being developed for future NASA spacecrafts. They were cameras that would be going to the planets like Jupiter and Saturn and Mars."

It was there, at NASA, in 1992 that Fossum invented the image sensor technology that earned him the Queen Elizabeth Prize for Engineering, an award he said was basically engineering's version of the [Nobel Prize](#).

"NASA decided they wanted to make the whole spacecraft instrument process less expensive and more frequent, so they were looking at how to shrink everything," Fossum said. "We were tasked with the problem of taking the cameras on the spacecrafts, which were pretty big cameras - the size of a microwave oven or bigger - and making them much smaller."

Fossum said it was understood at the time that the path to miniaturization was the integration of electronics, but that it was unknown how to do that while making a good image sensor.

The solution was what Fossum calls a camera on a chip. In engineering terms, it's a complementary metal-oxide semiconductor that does the trick. And what it does is convert light into digital signals. And it was compatible with modern technology.

This technology, which Fossum said has since been improved upon by many other engineers, is the basis for what's found everywhere today. It's in smartphones, in camera pills, and in the backup cameras in the rear of vehicles. From taking selfies to traveling on NASA space crafts to being the key to serious medical advances, the invention has made a lot possible, Fossum said.

"That technology is what allowed us to make really tiny cameras for smartphones like the iPhone, which has really led to an explosion in photography," Fossum said. "It also allows for other special things, like the camera in a pill that you swallow that takes pictures of the small intestines."

Fossum also considers his father a great inspiration for his interest in science, technology, and thinking creatively. His dad, also Eric Fossum, operated a business, called Inertia Dynamics, in the Collinsville section of Canton. The company made electromagnetic clutches and brakes for electric motors.

"I remember as a kid, I would go and help him do all kinds of things a kid could do to help his dad," Fossum said. "I don't think I realized it at the time the impact of it, but I certainly appreciate it now."

As an educator now, Fossum wants to give the same opportunities he had to students of all ages.

"It's a continuing process from elementary school through college and graduate students," Fossum said.

"People are learning that engineering is not only creative, it's a lot of fun. Especially in the end, when you see people on the street using your invention in a product. It gives you a lot of satisfaction that you accomplished something."

He is involved in invention programs at elementary schools and at the graduate level at Dartmouth, he's including his students in research that he hopes will result in them creating the next generation of camera sensor technology.

"We want to count photons of light one at a time," Fossum said. "You can think of light as being made out drops of energy, called photons. If you want to make a camera work under very low light, you can count the photons one at a time, but you need a very sensitive device to do that."

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