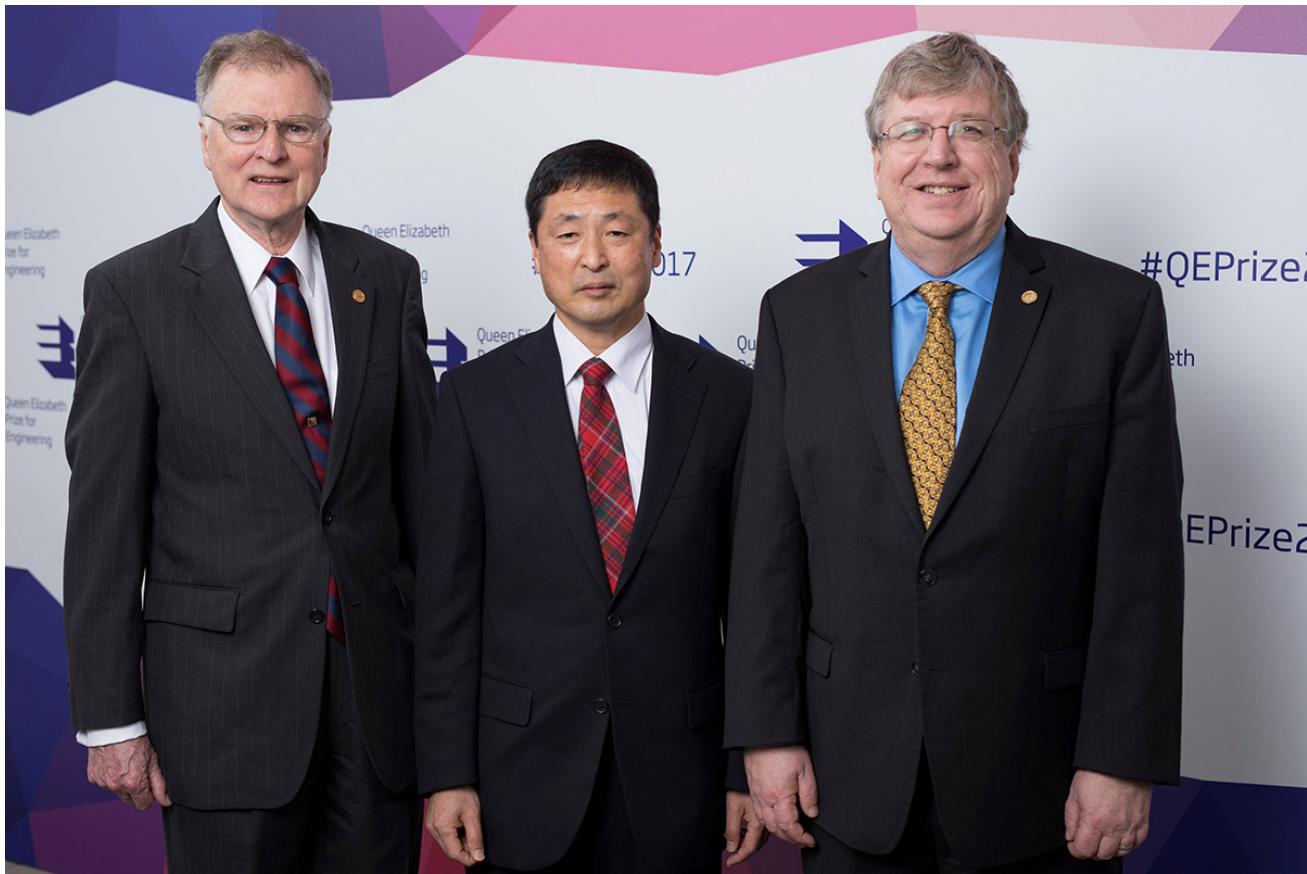


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£1 million prize for engineers who invented digital camera tech



Queen Elizabeth Prize winners Michael Tompsett, Nobukazu Teranishi and Eric Fossum
qeprize.org

By Victoria Turk

A £1 million engineering prize has been awarded to the creators of digital imaging technology now used in everything from medical sensors to smartphone cameras.

The winners of the 2017 Queen Elizabeth Prize for Engineering were announced at a ceremony at the Royal Academy of Engineering in London on Wednesday, and are Eric Fossum, George Smith, Nobukazu Teranishi, and Michael Tompsett. They worked on three technologies that made the cameras we use today possible.

Smith worked with Willard Boyle, now deceased, to develop the charged couple device (CCD) at Bell Labs in the US in the 1970s. Tompsett then realised this could have applications as an image sensor. CCD sensors were used in early digital cameras, and work by producing electrical signals when they detect light.

Teranishi invented the pinned photodiode (PPD) in 1980, while at the NEC Corporation in Japan. The PPD is a type of semiconductor that made it possible to capture images of higher quality.

The following decade, Fossum and his team at NASA's Jet Propulsion Laboratory worked on complementary metal oxide semiconductor (CMOS) sensor technology. Originally developed to make cameras used on spacecraft smaller and lighter, CMOS sensors require much less power than CCD sensors. This has led to the development of small cameras in smartphones and even "pill cameras" that can image the inside of the body when swallowed.

Trillions of devices

Speaking at a press conference before the award ceremony, Tompsett said that the strangest application he had heard of for the image sensing technology came from a group who wanted to insert a camera into the uterus of a sheep, "to observe ovulation or something". Fossum said he had never imagined the technology becoming popular for taking selfies or "silly cat videos".

Together, the winners' contributions to image sensors have "truly transformed the way we look at the world," said Christopher Snowden, chairman of the award's judging panel, noting that "there are "literally trillions of these devices in the world today."

Fossum, who is currently working on image sensors that count individual photons, says the technology will continue to develop to capture images of even higher quality and make more and more applications possible.

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