Oct. 17th

Eric Fossum

Born: Oct. 17, 1957;

Simsbury, Connecticut

Fossum is best known for the invention of the complementary metal-oxide-semiconductor (CMOS) image sensor "camera-on-a-chip" used in billions of cameras, from smart phones to web cams.

Fossum hit on an approach that reduced the signal noise that had plagued earlier devices, by applying a technique called intra-pixel charge transfer with correlated double sampling.

He developed it in NASA's Jet Propulsion Lab in 1993 in order to build cameras small enough for interplanetary space travel. It quickly became the Space Agency's single most ubiquitous spinoff technology.

However, Fossum later recalled, "People told me, 'You're an idiot to work on this.'"

A different imaging technology, using sensors based on the charge coupled device (CCD [next entry]), allowed high-quality digital photography to come of age by the late 1980's. As a result, Fossum and his team met with resistance from the digital imaging industry.

"Even a lot of my friends were negative," he said. "The technology was basically trying to eat their lunch."

In 2007 he helped sponsored the Trinity College Fire-Fighting Robot Contest.

CCD Invented

Oct. 17, 1969

George E. Smith and Willard Boyle of Bell Labs [Jan 1] were working on semiconductor memory when they came up with the "Charge 'Bubble' Device" which could be used both as a delay line and an imaging device. They had invented the first charge-coupled device (CCD), and in less than a year, they were being used as light-sensors in the first solid-state video cameras.

Smith later said: "After making the first couple of imaging devices, we knew for certain that chemistry photography was dead."

In 2009 Boyle and Smith were awarded the Nobel Prize for Physics, along with Charles Kuen Kao for his separate work on fiber-optic communication.

After retirement Smith and his partner, Janet, spent 17 years sailing around the world.

Wozniak Phreaks

Oct. 17 ??, 1971

Steve Wozniak [Aug 11] enjoyed reading the article "Secrets of the Little Blue Box" by Ron Rosenbaum [Oct 00] so much that he rang Steve Jobs [Feb 24] and read large chunks of it out to him over the phone.

The next day (a Sunday), the duo visited the technical library at the Stanford Linear Accelerator Center, and found a book [May 17] that listed all the frequencies mentioned in the *Esquire* piece.

Wozniak remembers: "I froze and grabbed Steve and nearly screamed in excitement that I'd found it. We both stared at the list, rushing with adrenaline. We kept saying things like 'Oh, shit!' and 'Wow, this thing is for real!'

By early 1972, Wozniak had built his own Blue Box, and was particularly proud of a trick he used to keep the power consumption down.

The pair set up an informal business to exploit the work. Wozniak built the boxes using $40 in parts, and Jobs sold them for $150 a piece by going door-to-door in student dorms. In keeping with the spirit of phreaking, Wozniak assumed the name "Berkeley Blue" and Jobs called himself "Oaf Tobar".

A friend of Wozniak's had met Cap'n Crunch [March 11], who was then working as an engineer/DJ for the KKUP radio station in Cupertino. The two Steve's set up a meeting with him in Wozniak's dorm room (110, Norton Hall).

Wozniak recalled: "The person showing up at my dorm room was disheveled and unclean and missing teeth and not the person I had expected. He saw my surprise and announced "I am HE, Cap'n Crunch.""

After a few hours of study under the guidance of the "master", Wozniak and Jobs knew how to call different countries, access satellites, and utilize trans-oceanic cables. During one test, Wozniak called the Vatican posing as Secretary of State Henry Kissinger and asked to speak to Pope Paul VI. Informed that the pope was sleeping but would be awakened, Wozniak lost his nerve and hung up.

A Wozniak Blue box. Photo by Maksym Kozlenko. CC BY-SA 4.0.

Following some close calls with the police and a gun-toting buyer, Jobs and Wozniak decided to wind down the business, but they'd sold around 200 blue boxes by then. One of them has been preserved at the Computer History Museum [Sept 24].

Randall Patrick Munroe

Born: Oct. 17, 1984;

Easton, Pennsylvania

Munroe is the creator of xkcd, (primarily) a stick figure webcomic which features computing, maths, science, and technology. He started posting

his drawings in Sept. 2005, and they quickly, and deservedly, became very popular. At the time, he was working as a contract programmer and roboticist for NASA at the Langley Research Center.

Munroe originally used the "xkcd" name as an instant messaging ID because he wanted a label without a meaning so he wouldn't grow tired of it.

For more computing cartoons, see [March 12], [April 16], [July 5], [Aug 23], [Sept 9], [Sept 24].

Intel 80386DX Released

Oct. 17, 1985

The Intel [July 18] 80386DX was the first 32-bit PC processor, running at 20 MHz (later increased to 33 MHz), with the ability to address up to 4 GB of physical memory or 64 TB of virtual memory. It contained 275,000 transistors, and cost around $100 million to develop.

Although it had a more complex instruction set than earlier Intel chips, it could still execute most code intended for 16-bit CPUs such as the 8088 [July 1] and 80286 [Feb 1]. This helped the "x86" instruction set become a de facto standard which has remained popular to this day.

The 386's increased power and use of modes helped encourage the introduction of GUI-based OSes, such as Windows [Nov 20] which could now run at fairly reasonable speeds on a standard PC.

The similarly named 80386SX (released in 1988) was a "lite" version, aimed at tempting the market away from the 80286 since it had roughly the same interfaces but better performance.

San Francisco Earthquake

Oct. 17, 1989

At 5:04 pm, a magnitude 6.9 earthquake hit the San Francisco Bay Area, killing 63 people, injuring more than 3,700, and causing around $5 billion in damages. The quake lasted 15 just seconds. The Marina district was particularly hard hit when the ground liquefied, and a stretch of the Nimitz Freeway collapsed.

Collapsed sections of the Nimitz Freeway. Photo by H. G. Wilshire for US Geological Survey.

Two *MacUser* magazine editors, John J. Anderson and Derek van Alstyne, were killed. They were usually based in Foster City, south of San Francisco, but had come into the city for a meeting. To honor their memories, *MacUser* created the John J. Anderson Distinguished Achievement Award and the Derek van Alstyne Rising Star award.

The DeAnza 3 building on Apple's Cupertino campus suffered some damage; at the time, it housed the system software, networking, and communications groups.

Nano Transistor Fraud

Oct. 17, 2001

Bell Labs, home of the first transistor ([Dec 16]1947), proudly announced that one of its young researchers had developed a nano-transistor composed of organic molecules about one-millionth the size of a grain of sand.

But scandal loomed when other scientists were unable to reproduce the results. Published papers on different aspects of the work were found to have used identical graphs, but only after eight articles had appeared in *Science* and *Nature*. During 2001, the researcher was listed as an author on an average of one newly published paper every eight days.

In May 2002, Bell Labs set up a committee to investigate the matter. Unfortunately the individual hadn't kept his lab notebooks, and relevant data files had been erased from his computer, apparently due to a lack of space.

The committee's report found multiple evidence of scientific misconduct, all carried out by the researcher alone. He had managed to fool his tech-savvy colleagues at Bell Labs for over four years.

A book about the fraud, "Plastic Fantastic", by Eugenie Samuel Reich, was published in 2009.

In 1830, Charles Babbage [Dec 26] wrote an essay, "Reflections on the Decline of Science in England, and on Some of Its Causes," which is considered a classic introduction to the problem of scientific fraud.

Re- 'Start' Button

Oct. 17, 2013

Microsoft released Windows 8.1 [Oct 26] which resurrected the much missed 'Start' button. However, it didn't come embedded inside an old-style 'Start' menu, but in an 'Apps' screen which at least reduced the prevalence of live tiles. The update also addressed a number of other criticisms, such as the inability to boot to the time-

honored desktop instead of the 'Start' screen usurper.

Eventually Windows 10 [July 29] revived the good-old ‘Start’ menu, but only for users prepared to right-click on the ‘Start’ button.