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PSA's 2003 progress medal honoree: Eric R. Fossum, Ph.D - Awards & Honors Recipients - Photographic Society of America

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Born and raised Connecticut, Eric R. Fossum received degrees in physics and engineering from Trinity College and the Ph.D. in electrical engineering from Yale University. As a member of Columbia University's faculty, he and his students performed research on CCD focal-plane image processing and high speed III-V CCDs. In 1990, Dr. Fossum joined the NASA Jet Propulsion Laboratory (JPL), and managed the JPL's image sensor and focal-plane technology research and advanced development. He led the invention and development of the CMOS active pixel sensor (APS) camera-on-a-chip and subsequent transfer of the technology to U.S. industry.

Dr. Fossum joined Photobit Corporation as Chief Scientist and became CEO of Photobit Technology Corporation in 2000. While at Photobit, he and his staff commercialized the camera-on-a-chip which has been used in PC cameras, ultra-low-power sensors enabling the swallowable "pill-camera," and very-high-speed, high-resolution sensors used for Hollywood special effects.

He is currently Adjunct Professor of Electrical Engineering-Electrophysics at the University of Southern California (USC) and teaches undergraduate physical electronics. He has also served as Adjunct Professor of Electrical Engineering at the University of California, Los Angeles (UCLA).

Dr. Fossum calls the shores of Lake Winnipesaukee in New Hampshire home, but spends significant time near Pasadena, California. He has three daughters and enjoys hiking in the San Gabriel Mountains, horseback riding, coaching children's soccer, and living on the lake. He was recently named to the Board of Fellows for Trinity College, CT, where he also serves on the College's Engineering Advisory Committee.

Statement of Acceptance:

I would like to thank the Photographic Society of America for this award. I feel very privileged to receive such an honor.

The "mother of invention" for this technology was the National Aeronautics and Space Administration's (NASA's) need for miniaturizing cameras for deep space interplanetary

missions. We needed a way to make the bulkier CCD cameras that NASA was flying with much less mass and volume, and using less spacecraft power. The idea of making image sensors (the electronic film) using mainstream microelectronics was not new, but we had to invent a new way of using those electronics to get high quality images, and so the "CMOS active pixel sensor" was invented.

I can't say that our technology was immediately adopted by NASA, and in fact, NASA's space science contingent is very slow to adopt new technology. As technologists, we felt the private sector was also too slow to embrace the potential of this new invention, so we left NASA to form Photobit. The CMOS image sensor technology quickly found its way into low-end computer "eyeball" cameras and in time moved up in number of pixels and image quality. Using the CMOS active pixel sensor technology, Photobit was also able to build high speed, high resolution cameras (e.g., 1.3 Mpixels at 1000 frames per second) and very low power cameras (e.g., the swallowable "pill camera"). The low power and highly integrated sensor electronics have now enabled the rapid emergence of cameras in cell phones and their low cost is propelling their application in automobiles.

As recently as just 2 years ago, proponents of the older CCD technology publicly proclaimed that the CMOS active pixel sensor technology would never be useful for photography. I am pleased to say that was just wishful thinking. Hardly anything has given me more satisfaction than walking into a camera store last May and buying a high quality 6 Mpixel brandname camera that uses my technology. Now, about 10 years after its invention, we have come the full circle as my friends at NASA tell me the technology is now being seriously considered for upcoming mainstream interplanetary space missions.

I would be remiss if I did not thank some of the organizations and people that made the development of this technology possible. The very early work we did at the Jet Propulsion Laboratory (JPL) was funded by the Defense Advanced Research Projects Agency and the NASA. Research and development at Photobit, was supported by the Small Business Innovative Research Programs of several government agencies including NASA and the Department of Defense, and by commercial contracts. I wish to acknowledge my research group at JPL and the fine team we assembled at Photobit Corporation (now Micron Technology) for their manifold contributions to developing the technology and keeping us ahead of our competition.

Eric R. Fossum, Ph.D.

Dr. C. W. Biedel, FPSA, Chairman, Progress Medal Committee