



(From left) Chris Mangelsdorf (a trustee at Analog Devices and great friend to Paul Brokaw), Paul Brokaw, and Bram Nauta.



Paul Brokaw explains the award during ISSCC 2020.

elegant small circuits, “a few transistors doing a big job.” “Our Society is truly blessed to have a pioneer and a role model like Paul Brokaw,” said Kenneth O, SSCS President.

For more information on the IEEE Brokaw Award for Circuit Elegance

and instructions on how to nominate a deserving colleague, visit <https://sscs.ieee.org/membership/awards/ieee-brokaw-award-for-circuit-elegance>. To learn more about the IEEE Foundation and how you can enable IEEE programs that, like the

Brokaw Award, improve access to technology, enhance technological literacy, and support education and the IEEE professional community, visit [www.ieeefoundation.org](http://www.ieeefoundation.org).

—Abira Altvater

## In Memory of Daniel Dobberpuhl (1945–2019)

Daniel Dobberpuhl, a pioneering leader in the field of high-speed microprocessor design, passed away on 26 October 2019 at the age of 74. He was born and educated in Streator, Illinois, where his love for electronics blossomed as early as elementary school. He graduated from the University of Illinois with a B.S.E.E. degree in 1967.

His career included employment at the National Security Agency, General Electric, Integrated Circuit Systems, Digital Equipment Corporation



Daniel Dobberpuhl, 1945–2019.

(DEC), Broadcom, and Apple. During his time at DEC, Dan, with former Massachusetts Institute of Technology professor Lance A. Glasser, coauthored *The Design and Analysis of VLSI Circuits*, a textbook that is considered a fundamental classic in very large-scale integration (VLSI) curriculum in universities today.

Dan was a consummate cross-disciplinary collaborator. At DEC, the melding of his circuit skills with insights from brilliant architects yielded remarkable microprocessors, including the DEC T-11 (the first single-chip PDP-11), the MicroVAX (the first single-chip VAX), and the ALPHA processor

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(the fastest microprocessor of its time). He culminated his career there with the design of low-power StrongARM processors, which powered Internet appliances, thin client systems, and personal digital assistants like the Apple Newton.

He was an extraordinarily creative designer who routinely devised circuit solutions that addressed key obstacles in any challenging project. Dan's innovative thinking drove many inventions and led to 15 patents for circuits, including floating-well input/output drivers, high-speed adders for ALPHA, and low-power clock gating.

Dan also cofounded many start-ups during his career, beginning with SiByte Inc., where he led the design of the first commercial low-power multicore system-on-chip. He founded P.A. Semi, where he led the design of the PWRficient architecture, the underpinning of low-power techniques later used by Apple in the

iPhone and iPad. P.A. Semi was eventually sold to Apple, from which Dan retired in 2009.

After retirement, Dan expanded his interests and involvement in the electronics industry by supporting numerous companies and start-ups. He particularly enjoyed working with and mentoring students and recent graduates just beginning their engineering careers. For them, he stressed the importance of generating robust designs based on a fundamental understanding of devices and architecture.

Throughout his life, Dan was a magnet for smart engineers and repeatedly assembled impressive organizations through his presence, abilities, and personality. He had great respect for all colleagues and was quick to point out what he learned from them.

Dan received many honors throughout his career. In 1996, *Forbes ASAP* cited Dan as one of the forces that would continue to expand the com-

plexity and efficiency of microprocessors. In 2003, he was awarded the prestigious IEEE Donald O. Pederson Award in Solid-State Circuits for his pioneering design of high-speed and low-power microprocessors. He was elected to the National Academy of Engineering in 2006 and was also honored with a 2003 University of Illinois Distinguished Alumni award and the University of Illinois College of Engineering Distinguished Alumni award in 2009. He was inducted into the University of Illinois College of Engineering Hall of Fame in 2016.

Dan leaves behind a legacy of distinguished engineers throughout the semiconductor industry who will never forget his guidance, leadership, and brilliance in VLSI design. He is survived by his wife, Carol; son, Walter; daughter, Christine; and Walter's two daughters, Katelyn and Nicole Dobberpuhl. May he rest in peace.

—Sribalan Santhanam

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## In Step with Eugenio Cantatore

### *The Dedicated Professor*

Eugenio Cantatore is a bright and very passionate member of the IEEE Solid-State Circuits Society (SSCS) and the IC community. Eugenio received his master's and Ph.D. degrees in electrical engineering from Politecnico di Bari, Italy, in 1993 and 1997, respectively. From 1997 to 1999, he was a fellow with the European Laboratory for Particle Physics, Geneva, Switzerland. In

1999, he moved to Philips Research, Eindhoven, The Netherlands, as a senior scientist.

In 2007, he joined the Eindhoven University of Technology, where he has been a full professor since 2016. Eugenio leads the Emerging Technologies Laboratory within the Integrated Circuits Group, which is headed by Prof. Pater Baltus and has 10 faculty members and 30 Ph.D. students.

His research focuses on the design of ICs in flexible electronics. The main idea of Eugenio and his team's

research is that it is possible to build transistors on plastic foils using special semiconductors that can be processed at a low temperature, which allows the plastic foils to withstand the method. The advantage to this process is that it is possible to create circuits that are mechanically flexible and cover a large area. There are three interesting examples of applications:

- Since flexible circuits are light and conform to the shape of a person, they are ideal for building

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