

# In Memory of Rudy van de Plassche (1941–2019)

I met Rudy van de Plassche for the first time in 1988, at a coffee machine on the fifth floor of a building on the campus of Philips Research Laboratories in Eindhoven, The Netherlands. At that time, I did not know who he was. He was just a friendly man talking to me when I started my first real job. That was Rudy, a humble, down-to-earth, and nice man.

Of course, my colleagues would soon tell me that this was Rudy van de Plassche, a world-famous analog designer, particularly in the field of analog-to-digital converters (ADCs). At that time, Rudy already had more patents to his name (then close to 50 and currently 76) than anybody else at Philips Research, which was huge, with more than 4,000 employees worldwide and more than 3,000 just at the site in The Netherlands.

Rudy was the inventor of many circuits and circuit ideas that have become commonplace. To mention a few, he invented folding (1979) and interpolating (1988) ADCs, capacitive feedforward compensation for transconductance amplifiers (1971), an auto-zeroed sample and hold circuit (1986), and chopper-stabilized amplifiers and dynamic element matching (1976).

As successful as Rudy was in his career, he also encountered setbacks. After he returned to Philips Research in Eindhoven in 1986 following a three-year stint at the company's laboratories in Sunnyvale, California, surprisingly enough, he was asked to work on digital radio, a different topic than his beloved data converters. Rudy thought about it and concluded that the most critical building block for a digital radio would be the data converter. He needed someone to work on the data converter, and, as it turned out, that was my lucky break.

Rudy wanted to implement folding in CMOS, a technique that until that point had been applied only in bipolar technologies. As he could not do it himself, he approached me and asked me to investigate whether this could be done in CMOS. At that point, I had no experience in data converters. I looked at the idea for a while, ran some simulations, and came to the conclusion that this could very well be done in CMOS. Triggered by this finding, Rudy asked me whether I could run some more simulations, which of course I did. Working with Rudy was terrific. To make a long story short, in the end, he asked me to finish the design and build a real ADC based on it. I did, and it worked well. This episode was the starting point for my collaboration with Rudy.

I had moved on to work at Broadcom (Irvine, California), a small start-up company at that time. Not much later, I learned that Rudy, unhappy about not working on data converters, made a career change as well and became a full-time professor at Eindhoven University. As I was eager to work with Rudy again, I called him to see if he could become a consultant for Broadcom, so that we could work together, and Rudy agreed. His consultancy period in Irvine was fantastic. Everyone in the analog group loved working with him, and there was so much to learn from him.

In 1999, I started the Broadcom design center in The Netherlands and immediately asked Rudy to join us full time. He quickly agreed and made the entire analog team extremely happy and me very proud as well. It was such a joy for everyone to work with Rudy, not only because of the immense amount of knowledge he shared with everyone but also because he was always pleasant.

Rudy could get to the essence of a circuit problem in just one or two sentences. Of course, every now

and then he had to correct us in our analysis of circuit problems. He would always start that by saying, "Well boss, ...", where he would use the word "boss" in such a way that, on the one hand, he made you feel okay but, on the other hand, you'd know that that word was the prelude to a correction that you had better listen to.

Everyone who knew Rudy will agree that he was very modest, never boasting about his successes. Even his biographies hardly speak of his achievements. Rudy authored more than 50 publications and 76 patents. For many years, he was part of the International Solid-State Circuits Conference (ISSCC) technical program committee, chaired the ISSCC European committee from 1995 to 2002, founded the Advances in Analog Circuit Design (AACD) workshop together with Willy Sansen and Johan Huijsing in 1980, was an IEEE Fellow, received the Veder award of the Dutch Stichting Wetenschappelijk Radiofonds Veder, and was the first European to receive the Solid-State Circuits Award (now called the Donald O. Pederson award).

With Rudy's passing, we lost not only a giant in analog design, of which there are only very few, but also a very valued colleague and a dear friend.

—Klaas Bult



I learned about Rudy van de Plassche because of his first paper at the ISSCC in 1971. It was what he called a simple frequency compensation technique for an operational amplifier. I was pursuing my Ph.D. degree at the University of California, Berkeley, at that time. Anything presented at the ISSCC was top priority, which is why I feel so familiar with his work.

That amplifier was obviously in bipolar technology, an expertise

Rudy would continue to use for his work on ADCs. This is also the technology that Rudy would become famous for. Moreover, that simple frequency compensation technique was feedforward, a technique heavily used today to decrease power consumption in the amplifying stage within a certain speed-noise budget. It is clear that Rudy was way ahead of most of us in the design of high-performance analog circuit blocks.

Rudy continued to give presentations at the ISSCC and to provide contributions to *IEEE Journal of Solid-State Circuits*. Because of his pioneering work, he was the first European to receive the Donald O. Pederson Solid-State Circuits Award (formerly known as the Solid-State Circuits Award) in 1996. As of 2020, only five Europeans have received this honor.

Rudy joined the ISSCC technical program committee in 1988, becoming secretary of the European committee in 1991 and the chairman in 1995, a position he would continue to hold until 2002. I became his secretary in 1997 and continued until 2002. This is the period of time when I really got to know him better and learned to appreciate and admire him. Rudy was an excellent



(From left): Rudy van de Plassche with Willy Sansen and Han Huijsing during the first AACD in 1980.

chairman. He was as sober in the meetings as he was in his design. He urged others to get straight to the point and come to a conclusion. This is not always a simple feat, as the European committee consisted of members from many different countries, who often preferred different paths to maybe similar conclusions.

Of the many delightful experiences I have had with Rudy, one sticks out in my memory. Together, we created the AACD workshop in 1980. This program was initiated

by Han Huijsing of Delft, The Netherlands. Both Rudy and myself were enthusiastic about it. We started this workshop in The Netherlands, first in Scheveningen, then in Leuven, and then in Veldhoven, and believe that it is still the most rewarding analog workshop in Europe. Priority is given to discussion rather than paper presentations. As I am still in analog design, I still use Rudy's papers in my courses, as a tribute to his legacy.

—Willy Sansen

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## **PRESIDENT'S CORNER** (continued from p. 5)

(AdCom) has approved the creation of a new technical committee, Solid-State Circuit Directions (SSCD). The committee's mission is to make our Society more agile in responding to the ongoing, rapid changes in our technical field and to help broaden our technical scope and membership base by stimulating the formation of new communities and exciting new venues, building bridges to other societies, providing new leadership

opportunities for young innovators, and increasing membership participation in our technical vision. The AdCom named Boris Murmann, professor at Stanford University, as the SSCD's first chair. The leaders of our Society and I are excited about the creation of this committee and look forward to its work to make our Society more agile and dynamic.

I would like to reiterate that the health and safety of our members,

volunteers, and IEEE staff are the necessary and most important requirement for any activities we organize and sponsor. We shall continue to serve our members with minimal disruption, while not compromising our priority of health and safety through this COVID-19 outbreak.

Please share your thoughts and suggestions by emailing me at [k.k.o@ieee.org](mailto:k.k.o@ieee.org). Be safe and healthy wherever you may be.

**SSC**