processing and communication in advanced and emerging technologies. At STEI ITB, Verma delivered a lecture, “Sensing on a Very Large Scale: Large-Area-Electronics Systems for Extensive Interfacing with the Physical World.” The talk was attended by approximately 50 faculty members, staff, and students. It was moderated by Dr. F. Ihsan Hariadi, head of Electronic Device Manufacturing Process Laboratory. The event began with an introduction to SSCS given by Suksmandhira Harimurti.

In the beginning of the lecture, Verma explained that the future of the Internet of Things (IoT) can change the way data is exchanged and transmitted. In the IoT era, any electronic devices and objects inside our homes are able to possibly communicate with each other and give us direct information. Hence, problems on how to manage such massive data emerge. Verma explained a novel method on how to implement large-area electronics for sensing multiple signals from the physical world and how to integrate the system with a machine-learning algorithm to reduce power consumption and learn the behavior of the signal.

Verma gave the audience some insight. “When we face a real problem, we will face a multidimensional problem,” he said. “Not a specific problem that we learn and majoring at school.”

Audience members enthusiastically listened to the lecture, which was followed by an interactive question and answer session. M. Iqbal Arsyad closed the lecture by presenting Dr. Verma with a gift.

—Suksmandhira Harimurti

SSCS Macau Chapter Holds Lectures by Prof. Robert Bogdan Staszewski

The IEEE Solid-State Circuits Society (SSCS) Macau Chapter organized two days of lectures given by Prof. Robert Bogdan Staszewski from University College Dublin, Ireland, on 27 July 2017. The lectures were held at the State-Key Laboratory of Analog and Mixed Signal VLSI at the University of Macau, China.

In his first lecture, “All-Digital Phase-Locked Loops (ADPLL),” he introduced the ADPLL techniques from system to circuit implementation and detailed these techniques as exemplified in several recent projects from his group, including a spur-free ADPLL for mobile phones, an all-digital polar transmitter using
¼-TV time-to-digital converter (TDC), a 60 GHz spurious-free fractional-N ADPLL, and an 860 μW ADPLL-based frequency modulator with a digital-to-time converter assisted snapshot time-to-digital-converter (TDC) for the Internet of Things (IoT) applications. Staszewski also discussed in depth the design of two critical submodules, such as digitally controlled oscillator (DCO) and TDC.

For the talk “Ultra-Low Power and Ultra-Low Voltage Wireless Transceivers for IoT,” Staszewski introduced the stringent requirements of the ultra-low power (ULP) transceivers for IoT applications and the evolution of the ULP transceiver architectures toward power reduction. He also talked about his recent work to further reduce transceiver power consumption. The innovated techniques include a fully discrete-time, high-intermediate frequency receiver architecture with complex-signaling bandpass filters and a progressively reduced sampling rate; an ADPLL using a digitally controlled oscillator with switching current sources to reduce supply voltage and power without sacrificing phase noise and startup margins, which allows it to reduce its sampling rate or shut off entirely during direct DCO data modulation; and a switching power amplifier integrates its matching network while operating in class-E/F2 to maximally enhance its efficiency.

The event attracted more than 30 graduated students, faculty members and engineers from universities and companies in Macao and Hong Kong and provided a good opportunity for the local Chapter members to learn from a world-renowned expert. After the lectures, Staszewski had a lively discussion with the students and engineers and answered their questions about their research and industrial projects.

—Jun Yin
—Pui-In Mak