Winter 2022–Spring 2023: Looking Back at Switzerland Chapter Activity

The IEEE Solid-State Circuits Society (SSCS) Switzerland Chapter entered 2023 with a nice closing of 2022 and a very rich start to the year.

On 18 November 2022, Prof. Tony Tae-Hyoung Kim, professor, Nanyang Technological University, and an IEEE Distinguished Lecturer, provided the Swiss Chapter with a tutorial, "Design of Computing-in-Memory: Analog Versus. Digital" [1]. The talk attracted 52 IEEE Members on site and 13 people online. While the material was well thought through and provided a lot of interesting insight on computing-in-memory basics and challenges, it felt to some audience members as though the presentation was a showcase of Kim's own research, lacking opposing points of view. Yet, the lecture was appreciated, and it closed with drinks with the speaker and audience, where more informal conversations could take place.

Another technical talk, "Delta Sigma ADCs: Theory, Circuit Design Challenges and Ways to Address Them," was held on 8 December by Dr. Amrith Sukumaran, Swiss Center for Electronics and Microtechnology (CSEM), and 50 people joined online and offline at ETH Zurich. The material was well received and provided a thorough overview while building up the audience's knowledge and providing attendees with a good challenge. Some audience members offered other solutions to the presented challenges, with nice analysis, which would make the event a worthy SSC tutorial [2].

Events in 2023 started with the International Solid-State Circuits Conference (ISSCC). Switzerland Chapter members coauthored seven submissions, representing a good mix of industry, corporate research, and academia; Sony Advanced Visual Sensing, Zurich, Switzerland, contrib-

uted two papers [3], [4]. For ISSCC session 16, "Efficient Compute-In-Memory-Based Processors for ML," Thomas Boesch, ST Microelectronics, contributed to [5], showing a nice neural network accelerator leveraging in-memory computing on 18-nm FDSOI nodes. For session 17, "High-

Speed Data Converters," researchers from ETH Zurich and IBM's Zurich research laboratory contributed [6], with technical achievements in 5-nm technology. Session 21, "Emerging Sensing Systems and IOT," had a contribution from ETH Zurich [7], covering interesting circuits to explore

The audience waits for Prof. Kim's lecture to begin.

Prof. Jang introduces Prof. Kim for his presentation.

Chapter of the Year
IEEE SSCS Switzerland Chapter

Taekwang Jang
Chair

Michel Bron
Vice Chair

Mathieu Coustans
Secretary

Domenico Pepe
Industry Relations Coordinator

The SSCS Switzerland Chapter wins 2022 Chapter of the Year.

2022 Jan Van Vessem Award for Outstanding European Paper
"A Second-Order Temperature-Compensated On-Chip R-RC Oscillator Achieving 7.93ppm/°C and 3.3pJ/Hz in -40°C to 125°C Temperature Range"

Youngwoo Ji[1,2] Jiawei Liao[1] Sina Arjmandpour[1,3] Alessandro Novello[1] Jae-Yoon Sim[2] Taekwang Jang[1]

[1]ETH Zürich, Zürich, Switzerland, [2]Pohang University of Science and Technology, Pohang, Korea
[3]Sharif University of Technology, Tehran, Iran

The Jan Van Vessem Award for Outstanding European Paper
Jan Van Vessem served ISSCC as the first Chair of the European Program Committee from 1968 to 1974.
The Award in his honour is based on ratings by Conference attendees in the previous year.

The 2022 Jan Van Vessem Outstanding European Paper award goes to Prof. Jang's group for its research on timers.

2022 ISSCC Award for Outstanding Forum Presenter
"Sensor Interface, Analog, and Mixed-Signal Circuits for Miniaturized IoT Devices"

Taekwang Jang
ETH Zurich, Zurich, Switzerland

The Outstanding Forum-Presenter Award
This Award is based on Forum-attendee ratings from the previous year.

Prof. Jang is awarded for the final ISSCC forum, "Sensor Interface, Analog, and Mixed-Signal Circuit for Miniaturized IoT Devices."

biology–electronics codesigns to overcome interface limitations. For session 22, "Heterogeneous ML Accelerator," there was a contribution from ETH Zurich leveraging FDSOI technology [8] as well as on-the-fly adaptability building blocks, maintaining performance in all conditions. Finally, session 30, "Power Management Techniques," received at contribution from Dr. Filippo Neri [9], Renesas Electronics, showing single-chip, Qi-compliant, 40-W wireless power transmission.

In addition to the regular session, one tutorial, two forums, and a special event panel session should be noted. Tutorial 12 was provided by Prof. Luca Benini, "Extending Processor Cores for Machine Learning." To forum 6, "The Future of Heterogeneous Multi-Core Architectures for AI and Other Specialized Processing," Dr. Angelo Garofalo, postdoctoral student, ETH Zurich, contributed the presentation "Is an AI Accelerator All You Need? Overcoming Amdahl's Law With Tightly-Coupled Heterogeneous Accelerators." Forum 7, "Advanced Circuits and Technologies for Wearable and Implantable Devices," Prof. Stéphanie Lacour, Federal Institute of Technology Lausanne, provided "Hybrid Implantable Neural Systems: From Soft, Biomimetic Devices to Translational Interfaces." Concluding the contributions to ISSCC, Prof. Hua Wang, ETH Zürich, participated in the 20 February event "Integrated
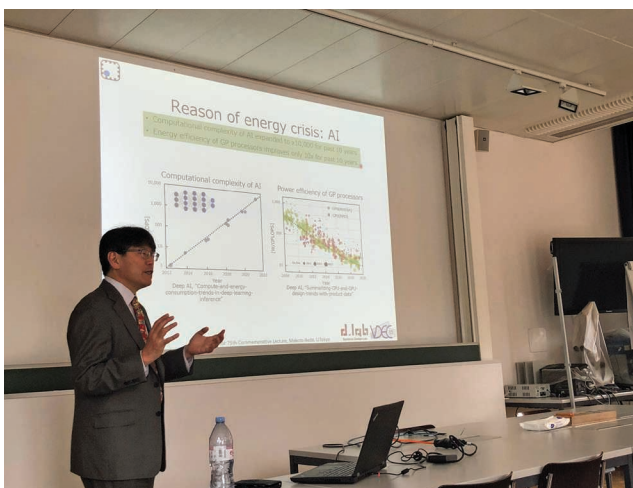
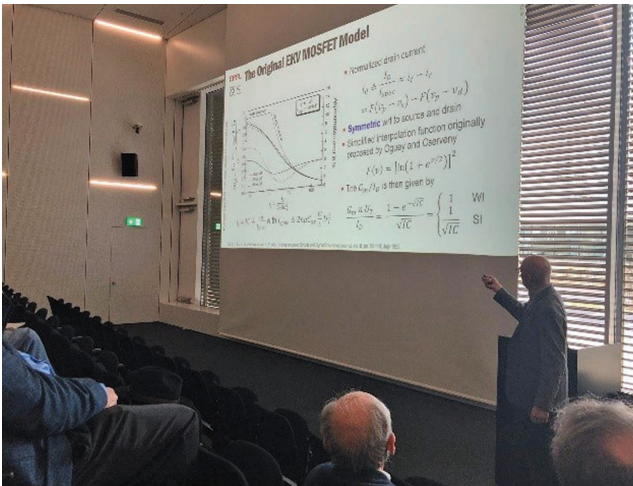**Prof. Ikeda lectures at ETH Zurich.**

Audience members listen to Prof. Ikeda-san's presentation.

Prof. Lee begins his speech.

Prof. Mangelsdorf makes his presentation.

Prof. Enz speaks about the g_m/I_D methodology and scalability down to 22-nm FDSOI.

The audience listens to Prof. Enz's speech.

Panelist members discuss past and future semiconductor challenges: (from left to right) Hugo Wyss, Grede, Porret, Eric Vittoz, and Dijkstra.

Panelists and audience members gather after a session.

Circuits in an Interconnected World" as a panelist.

Additionally, the ISSCC awards included one for the Switzerland Chapter, which makes us very proud. At the same time, we are grateful to our members, who make the Chapter lively; local industry that collaborates with us on topics it wants to see addressed; and the Distinguished Lecturers and Society staff who support us in our journey.

Alessandro Novello, ETH Zurich, and Uisub Shin were recipients of predoctoral achievement awards. For the second year in a row, the group of Prof. Taekwang Jang won the Jan Van Vessem Outstanding European Paper award for its paper [10], this time dealing with time reference. The group's circuit has two PLLs and complexity that involved the efforts of many students, including collaborators at Pohang University and Sharif University of Technology. In addition, Jang was named a 2022 outstanding forum presenter.

On 29 March [11], we had the pleasure to welcome Prof. Makoto Ikeda-san for a commemorative lecture on the transistor's 75th anniversary. The lecture reviewed essential challenges of leveraging transistor-based technology in the next decade and then focused on the design of accelerators for encryption algorithms, starting with elliptic curves and pairing before extending the discussion to postquantum and fully homomorphic encryption with lattice-based algorithms to withstand attacks from quantum computers. The lecture attracted 10 attendees—nine students and one guest, from a firm working to secure banking systems. This led to a good mix of questions and discussions on applications and digital design implementation.

Continuing with the transistor's 75th anniversary, on 30 March, we received a nice overview [12] from Prof. Tom Lee, Prof. Chris Mangelsdorf, and Prof. Christian Enz. In addition, we collaborated with the local Life Member Affinity Group to discuss how the Chapter relates to transistors and how point contact germanium transistor manufacturing arrived in Switzerland in the 1950s, evolving toward the watchmaking research institution CEH.

We also invited panelists for forward-looking talks with the CSEM, represented by Alain-Serge Porret (vice president, integrated and wireless systems). They were Evert Dijkstra (managing director, Phonak) and Andre Grede (chief technology officer, Comet), whose companies are pushing the design and manufacturing of semiconductors and related
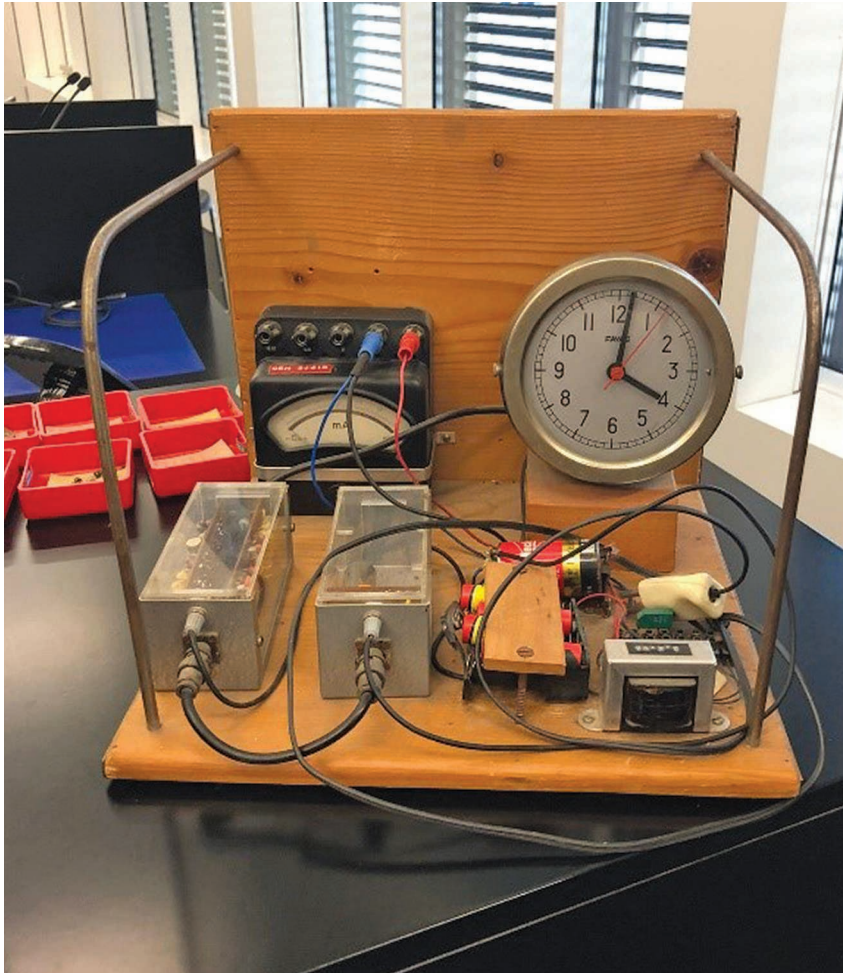
A hardware demonstrator, provided by John Wellinger, son of Roger Wellinger, who directed research toward the microwatt clock at CEH, is on display.
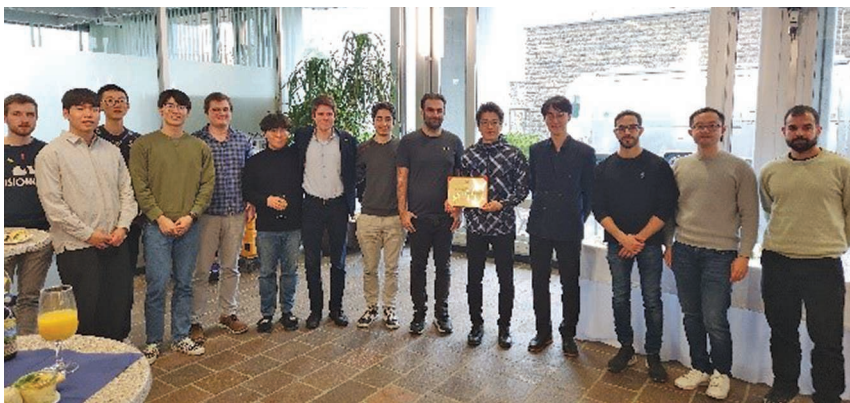
Prof. Lee and attendees assemble after his presentation.

systems. The panel had a rich discussion on past challenges and those that lie ahead. The event attracted 72 attendees in the auditorium and eight people online, while the drinks session afterward attracted 42.

Finally, on 31 March, the Chapter held a Distinguished Lecture [13] by Prof. Yoonmyung Lee, "Securing IoT Systems With Cost-Effective Physically Unclonable Functions." Fifteen IEEE Members attended.

Overall, we are happy to have provided our seminar participants, whether online or in person, with such good content at this point in the year. Indeed, we are looking at their feedback on the breadth and depth of the addressed topics and suggestions for future events as well as willingness to volunteer and contribute. We encourage Chapter members to have a look at our website, where an effort to bridge with industry has been taking place by mapping companies and providing them a forum to describe what they do.

—*Mathieu Coustans* 🅾

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Let's All Go to the 16th IEEESTEC!

We can proudly say that the WE Electron Devices Society (EDS)/Solid-State Circuits Society (SSCS) Joint Serbia and Montenegro Chapter and the University of Niš EDS/SSCS Student Branch Chapter have continued 2023 in the same light and with the same intensity as until now. Since the beginning of the year, many events have been organized, both workshops and informal events, all with the aim of promoting and popularizing the engineering profession and IEEE. At these events, directly or indirectly, the goal was to prepare scholars and students for the challenges that await them as future engineers.

Among the many events, we would select the Winter School at the Science Club of the training center in Leskovac, Serbia. On that occasion, two workshops called "Interesting Electronics" were held. The workshops were attended by 40 students of different ages from primary and secondary schools from Leskovac. In the workshops, simple electronic circuits were processed theoretically and practically using basic electronic components. Also, the