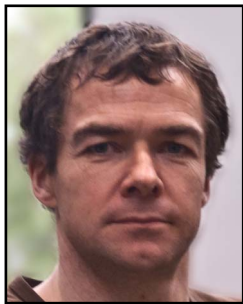


# Foreword

## Building on 70 Years of Innovation in Solid-State Circuit Design



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A warm welcome to ISSCC 2023! We are happy that in many parts of the world the Covid restrictions are no longer preventing us from having a mainly in-person conference. For those who are still unable to travel due to Covid, we are with you, and we hope that you can still enjoy the Conference with our online offering.

This year ISSCC is turning 70: seventy years ago, in an era where the industrial world was still recovering from World War II, and a few years after the invention of the transistor, ISSCC was founded in Philadelphia by the University of Pennsylvania and the local chapters of the IRE and the AIEE, which are the predecessors of the IEEE. Since then, ISSCC became the foremost global forum to publish advances and innovations in solid-state circuit design. In a world that is increasingly relying on chips for almost all aspects of our daily lives, ISSCC is, despite of its age, looking to the future, seeking innovative designs more than ever. This goes hand in hand with performance advances of state of the art. The conference emphasizes this with two highlighted sessions of invited papers, one with out-of-the-box ideas and one with chip releases from industry. Another novelty from this year on is the increased presence on social media. Next to the website <https://www.isscc.org/> you can also follow ISSCC 2023 activity on Instagram® and Twitter®.

The International Technical Program Committee (ITPC) of ISSCC has selected 198 outstanding papers besides the invited ones mentioned above. Of these papers, 60% come from Academia, 21% from Industry and 19% from joint Industry/Academia collaborations. The papers have been selected by the ITPC with a double-blind review process that avoids biases. The ITPC is composed of 171 experts covering a very broad expertise from analog to digital design and is divided into twelve subcommittees. Next to the papers that have been selected by the ITPC, there are four plenary papers, bringing the total number of papers to 210. For all these, the presentations, papers, and slides will be available online. Q&As will happen live. While the plenary talks will be streamed live, the other presentations will be recorded live, and they will be made available in the week of the conference, as part of the online conference offering. Further, all attendees, both in-person and on-demand, will have access to an online chat to ask questions to authors about their papers. Some selected publications will be showcased during live Demonstration sessions where the attendees will be able to see the circuits really functioning and ask questions to their designers.

Next to the papers, ISSCC 2023 has a broad offering of educational events: first, there are twelve tutorials, one per subcommittee. These are available online before the conference. In-person conference attendees have the possibility of interviewing the tutorial speakers in-person. In parallel an online chat is available for an asynchronous Q&A, just as for the regular papers. While tutorials describe the fundamentals of subjects in the domain of each of the twelve subcommittees, the short course offers an in-depth learning experience on one topic, which, for ISSCC 2023, is quantum computing. Further, a total of seven forums are foreseen. These forums showcase the recent state of the art – presented by leading experts in the field – in the domains of high-speed wireline transceivers, wireless transmitters, extreme data converters, multi-core architectures for AI, and technologies for automotive, wearable/implantable devices, and extended reality. The forums and the short course are organized in-person. However, the talks of these events will be recorded, and the recordings will be available online a few days later.

ISSCC 2023 has also diversity, students research preview and Young professional events that are organized in person: on Sunday afternoon there will be a “Mentoring Session/Networking Bingo” and on Sunday evening the Student Research Preview will showcase emergent student innovations. Further, for Monday evening the conference will offer two live panel discussions: one on “The Path to Sustainable IC Ecosystems” and one on “Integrated Circuits in an Interconnected World”. The latter is organized by the IEEE SSCS Women in Circuits. Tuesday evening contains an interactive quiz show “The Smartest Designer in the Universe, Post Pandemic!” and a panel titled “What will be the Essential Skills for IC Designers in the Next Decade?”

The high quality of the Conference Program can only be achieved thanks to the splendid voluntary work of the ITPC members. I thank them all for their efforts. Each member has spent much time to the reviews of the submitted papers, to the planning and organization of the sessions, the evening sessions, and educational events, preparing the Advance Program, Press Kit, and Digest material, and taking up Session Chair or Organizer duties. My special thanks go to the Subcommittee Chairs for their leadership in these tasks: Maurits Ortmanns (Analog), Jan Westra (Data Converters), Tom Burd (Digital Architectures & Systems), Keith Bowman (Digital Circuits), Rikky Muller (Imagers/MEMS/Medical/Displays), Sukhwan Lim (Machine Learning and AI), Marvin Chang (Memory), Bernhard Wicht (Power Management), Jan Craninckx (RF), Ali Hajimiri (Technology Directions), Chih-Ming Hung (Wireless), and Yohan Frans (Wireline). I also sincerely thank the leadership of the Regional Committees: Bruce Rae and Matteo Bassi from Europe, and Jun Deguchi and Man-Kay Law from Far East. My very special thanks go to Frank O'Mahony, ITPC vice-chair who gave an immense contribution to build this program. Also, thanks to Edith Beigné, ISSCC 2022 Program Chair, who inspired a lot with her exemplary work last year.

ISSCC would not be possible without the help of many other individuals that deliver excellent support work behind the scenes. I thank Melissa Widerkehr and Widerkehr and Associates for their valuable support with Conference operations and arrangements. I am grateful to Brad Phillips and MIRA Digital Publishing for their assistance with the electronic manuscript submission, pre-voting, and assembly of the Advance Program, as well as the Digest and the powerful MiraSMART Conferencing, to Stephen Bonney and S<sup>3</sup> iPublishing for help in many aspects such as figure layout and page formatting. Also, I am deeply grateful to the Technical Editors: Jason Anderson, Leo Belostotski, Dustin Dunwell, Vincent Gaudet, Glenn Gulak, James Haslett, Shahriar Mirabbasi, and David Halupka both as an Editor and multi-media-coordinator. Also, I want to thank Carolina Mora López, the first Social Media Chair of ISSCC.

I don't have enough words to thank Laura Fujino and Kenneth Smith, the “anchors” of the conference. They provided lots of precious advice and helped with so many aspects of the Conference, including awards, paper submission process, preparation of the Advance Program, Press Kit, Digest, editing and presentation preparation, and the MIRA Digital Publishing platform.

My sincere appreciation goes to Shahriar Mirabbasi for his leading role in the Press Kit preparation, and Jerald Yoo for organizing the Student-Research Preview, to Ali Sheikholeslami, Dan Friedmann, Naveen Verma, and Stefano Pellerano for their coordination and organization of Short Course, Tutorials and Forums; to Patrick Mercier for organizing the Demonstration Sessions, to Alicia Klinefelter and Vivek De for organizing the Invited Industry Sessions, to Ali Hajimiri and Firooz Aflatouni who organized for the first time an Invited Session with Out-of-the-box ideas. Further thanks go to Kathy Wilcox, in charge of the SSCS Women-in-Circuit committee, to Trudy Stetzler for managing the Conference website, and to John Weinmann for his financial oversight for the Conference.

Furthermore, I gratefully acknowledge the immense help provided by the volunteer graduate students from the University of Toronto, who, thanks to their technical expertise, ensure the orderly conduct of the presentations in every session, and countless other behind-the-scene activities.

A very special thanks goes to Eugenio Cantatore, ISSCC Conference Chair, Anantha Chandrakasan, ISSCC Senior Technical Advisor and Kevin Zhang, ISSCC Past Conference Chair. Their continuous support, involvement, creativity and leadership are exemplary and their inputs make ISSCC an outstanding conference. The experience of having worked with them is unique and will keep on energizing me.

Finally, I express my great appreciation for all contributors to ISSCC, including authors and speakers, who are not only excellent circuit designers but also committed to share, in the most professional way, their knowledge with all of us!

I look forward to seeing you in person at this anniversary edition of ISSCC and I hope you will enjoy the conference!

Piet Wambacq, ISSCC 2023 International Technical-Program Chair