FEBRUARY 2022

CONNECTIONS

LATEST NEWS AND UPDATES FROM
SEMICONDUCTOR RESEARCH CORPORATION

SRC & NSF Announce Support of Semiconductor REU - Research Experiences for Undergraduates

NSF and SRC have committed to support hands-on research opportunities for undergraduate students in technical areas related to microelectronics and advanced packaging technologies. The 5-year plan, part of SRC's 2023 – 2027 NST++ initiative, will invite champions of REU program proposals to apply for funding in 2022, so that selected cohorts can see their first batch of students participate at the new REU sites starting in the summer of 2023. The new investment aligns directly to SRC's Broadening Participation Pledge and also acknowledges that the development of talent in semiconductors is of high national priority. Learn more at SRC.org and NSF.gov

READ ON FOR MORE NEWS AND UPDATES!

Semiconductor Research Corporation

The 2030 Decadal Plan for Semiconductors

The year 2021 was a very special year as SRC; we released the full 2030 Decadal Plan for Semiconductors, a strategic road-mapping initiative. The plan identifies five seismic shifts the industry must confront head-on through innovative research and development in semiconductor hardware and systems. The Decadal Plan provides an executive overview of the global drivers and constraints for the continued growth of our industry, however it does not offer specific system solutions. Rather, *the document identifies 'what,' not the 'how,'* leaving space for new ideas and investments. Learn more about what we have accomplished and what's next by reading the full article on LinkedIn.

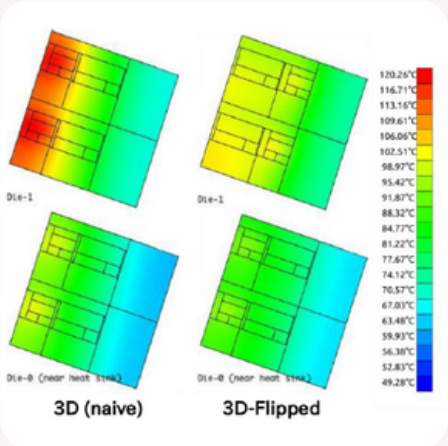
The Five Horsemen of the Data Apocalypse

The importance of the SRC 2030 Decadal Plan for Semiconductors continues to receive acclaim. Read The Next Platform article, "The Five Horsemen of the Data Apocalypse" as it nicely illustrates the Decadal Plan's five seismic shifts and puts context around the challenges facing them. The newly announced SRC JUMP 2.0 partnership with DARPA will start to scratch the surface of the required investment, today, to deliver industry-wide breakthroughs, tomorrow. Read more »

Engaging JUMP 2.0 Proposers' Day Workshop a Success!

Interest and excitement in the JUMP 2.0 program was clear at the JUMP 2.0 Proposers' Day Workshop in January. While we had hoped to hold the event in person, the workshop was held virtually on January 25th and attended by more than 300 participants including professionals from DARPA and our 11 industry partners, as well as faculty from 77 universities. Speakers from SRC, DARPA, and industry partners gave an overview of the program goals (including broadening participation and the goals of the DARPA Young Faculty Award program) and the seven research themes. They also affirmed the growing importance of U.S. University Research to advance the 2030 Decadal Plan goals. A lively Q&A gave proposers an opportunity to clarify sponsor intent and submission rules. A separate poster session was held via Gather Town on January 27th where 65 posters were presented for industry feedback, ahead of the March 7th submission deadline. JUMP 2.0 is looking for new teams, new ideas, and new energy to address the hard challenges faced by the semiconductor industry in the years ahead. Learn more here.

Enabling the Next Microelectronic Revolution



SRC research sets new directions in Advanced Packaging, which along with 3D monolithic and 2.5D/3D heterogeneous integration, will be the key enabler of the next microelectronic revolution. In fact, advanced packaging+3D is becoming the equivalent of the transistor of the Moore's Law and ITRS era. However, there are many issues that needs to be resolved for full-scale 3D chip technology to become a reality – and heat is among the primary concerns. Enter "Exploration of Holistic Scaleout Designs within Heterogeneous Packages for HPC/Server Processors" (GRC Task 2878.007) at SUNY Binghamton. The work by Profs. Kanad Ghose and Bahgat Sammakia and students demonstrated 2.5D scaling with chiplets and techniques for 3D stacking chiplets with multiple processor cores and memory that are thermally aware and can regulate their activity to avoid overheating and, at the same time, maintain performance. (Read the report.) The close engagement between industry liaisons from IBM, Intel, and Samsung has been invaluable to the success of the project. This is also a good example of effort addressing the Decadal Plan Seismic shift of The Growth of Memory and Storage Demands. More to follow!

Veteran SRC Researcher featured in Wall Street Journal

Georgia Tech Professor Andrei Fedorov was recently interviewed by the Wall Street Journal regarding their research in microelectromechanical systems and novel materials. In Christopher Mims' piece, "The Nanotechnology Revolution Is Here—We Just Haven't Noticed Yet," he posits that while we don't yet have tiny robots in our bloodstream to repair cellular damage, the nanotechnology revolution is, nevertheless, quietly underway. Everyday things we take for granted have been impacted by nanotechnology, such as airbags, cell phones, radars, inkjet printers, home projectors, cell networks, and other high-speed wireless technologies. Read more (subscription required).

Multilingual Spoken Words Corpus

The Multilingual Spoken Words Corpus (MSWC), recently released by MLCommons, is a diverse multilingual dataset that spans languages spoken by over 5B people. The MSWC is a rich audio speech dataset with more than 340,000 keywords in 50 languages with upwards of 23.4M examples. SRC is proud to be a part of this incredible effort to bring the wonders of voice technology to the rest of the world! Special shout-out to researcher Colby Banbury (JUMP ADA Center) for their contributions to the Multilingual Spoken Words Corpus, presented at NeurIPS 2021.

SRC Semiconductor Research Corporation

Association for Computing Machinery names Fellows

The Fellows program celebrates the exceptional contributions of the leading members in the computing field. The accomplishments of these Fellows underpin important innovations that shape the technologies we use every day. We'd like to celebrate these current and former SRC Researchers and Research Scholars who were selected for the 2021 ACM Fellows!

Tajana Rosing, UCSC; Wenping Wang, TAMU; David Pan, UT/A; Xiaobo Sharon Hu, ND
Lin Zhong, Yale; Hai "Helen" Li, Duke; Mark Tehranipoor, UF; Shlomo Zilberstein, UMass Amherst
David Kaeli, NEU; Feifei Li, Alibaba; ; Tanzeem Choudhury, Cornell

Top 5 SRC Publications Viewed Across All Programs

Don't miss the papers that received the most views on the SRC website over the last six weeks. Members of the associated programs have early access to the pre-publications.

- Goals and Plans for Year 5: ASCENT (Publication P105864)
- Electrospray Printing of Conformal Polyimide Films onto Complex Geometries (Publication P106084)
- Ferroelectric Domain Switching in the GHz Regime (Publication P105489)
- Understanding the Interplay between Charge Trapping and Polarization Switching Through Complementary Ferroelectric FETs and Exploring Novel Technology Applications (Publication P103127)
- ASCENT Center Metrics for Milestone #18 (Jul 1 2021 - Sep 30, 2021) (Publication P105846)