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SIGDA - The Resource for EDA Professionals
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Online archive: https://www.sigda.org/newsletters/

SIGDA News

1. **IBM Targets US Quantum Manufacturing with $1BN Foundry Plan**
IBM and the US Department of Commerce have unveiled plans for what they say will be America's first purpose-built quantum chip foundry, backed by a proposed $1bn award under the CHIPS Act.

2. **NVIDIA Revenue Jumps 85% on AI Demand**
NVIDIA has posted another quarter of rapid growth, reporting record first-quarter fiscal 2027 revenue of $81.6 billion, up 85% year-on-year as demand for AI infrastructure continues to surge across hyperscale data centres, enterprise deployments, and edge systems.

3. **Marvell Posts Record Q1 Revenue on AI Data Centre Demand**
Marvell Technology has posted record revenue for the first quarter of fiscal 2027, driven by strong demand for AI infrastructure and data center networking technologies.

4. **NVIDIA Partnership Expands AI Optical Connectivity Manufacturing**
NVIDIA and Corning have announced a long-term partnership to expand U.S. manufacturing capacity for AI optical connectivity, as hyperscale data centres require more fibre, photonics, and interconnect technology for accelerated computing systems.

5. **AMD Unveils Compact Versal Prime Gen 2 Devices with High Scalar Compute**
AMD has expanded its Versal Prime Series Gen 2 adaptive SoC family with three new devices designed for embedded applications that need high compute performance in smaller footprints.

6. **Huawei 1.4 nm Target Leans on Tau Scaling Law**
Huawei has set out a 2031 target for high-end chips with transistor density equivalent to 14 Å, or 1.4 nm, processes, using a design principle it calls the Tau (τ) Scaling Law. The Huawei 1.4 nm claim is not a statement that China has solved leading-edge lithography. It is an attempt to move part of the scaling

Message from the EiC

Dear SIGDA members,

In this edition, we bring you the latest news and activities in our community, paper deadlines, upcoming conferences, an insightful article on What is Physical Computing, and job openings worldwide.

Please do not hesitate to write to us if you want to contribute articles and announcements or share your thoughts and feedback.

Sandeep Chandran,
Editor-in-Chief,
SIGDA e-Newsletter

argument away from gate geometry and towards timing, interconnect and system-level efficiency.

7. SEMI and NSF Expand US Microelectronics Talent Initiative
SEMI and Global Net Corp. (GNC) have released a new report pointing to strong long-term growth for glass core substrates as chipmakers look for new ways to support AI and high-performance computing (HPC) workloads.

8. Intel Arc G3 Targets Handheld Gaming PCs
Intel has put a more direct stake in the handheld gaming PC market with Intel Arc G3, a new Arc G-series processor family built from Panther Lake silicon and aimed at OEM designs rather than adapted notebook systems.

What is Physical Computing?

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The foundations of computing were established in the 1950s by pioneers such as von Neumann and Turing, and they have remained largely unchanged ever since. Today, however, the rise of AI has driven an unprecedented expansion in cloud-based infrastructures, smart edge devices, energy demands for training and deploying models, and the sheer volume of generated data. These developments have intensified the need for reliable computation on application specific hardware, especially for resource constrained and battery powered systems like edge devices. As a result, both academia and industry are actively exploring new approaches. We are now seeing a surge of innovative ideas in alternative computing inspired by neuroscience (brain inspired architectures), biology (biological neural networks), and physics (statistical physics and quantum mechanics).

An emerging and compelling paradigm in computing is ***physical computing***, which leverages fundamental principles of physics. In this approach, physical variables are encoded within a dynamical system that evolves according to the laws of classical or quantum mechanics. This represents a significant departure from traditional, instruction based computation, where information is expressed through signal amplitudes representing binary values of 0 or 1. In contrast, physical computing encodes information as continuous variables, often using frequency or phase differences between signals allowing computation to be carried out directly through the system's natural physical dynamics [1].

One interesting paradigm is **probabilistic computing**, which encodes information in inherently stochastic physical processes. Instead of deterministic binary states, probabilistic bits (p-bits) fluctuate between 0 and 1, allowing the system to naturally explore many possible configurations. This enables efficient solutions to sampling problems and optimisation problems that exploits stochasticity of devices such as stochastic magnetic tunnel junctions, spin-orbit torque devices, CMOS random generators, stochastic spin Hall effect devices,

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among others as a computational resource for implementing probabilistic bit device [2]. P-bits explore many configurations which makes them attractive for solving sampling and NP-hard problems.

Another promising direction is **phase-based computing with coupled oscillators**, or Oscillatory Neural Networks (ONNs). In such networks, the information is represented not as a signal amplitude but in the relative phase differences between oscillatory signals. The simplest oscillator is a sinusoidal signal with a periodic function. Coupled oscillators exhibit rich dynamics which can be leveraged for computing. Coupled oscillator phase dynamics evolve towards states of lower energy once they stabilize and reach steady state which also correspond to the solution of the problem that is embedded on them. Phases represent a continuous variable for information from 0o to 360o which allows for multi-bit information encoding. Oscillatory neural networks have been designed and implemented using digital, analog and phase-change materials (i.e., VO2) though at different size networks and they are used for associative memory such as pattern retrieval, constraint satisfaction, combinatorial optimisation problems, classification and image processing [3]. Since the computation is performed through intrinsic synchronization dynamics of the network, ONNs are capable of massive parallelism and reaching fast time to solution while being low power.

A third paradigm in physical computing is **thermodynamic computing** which leverages the principles of statistical mechanics. The computation is achieved by allowing the system to evolve towards states of lower energy by exploiting the natural relaxation process. This approach is relevant for problems involving annealing and it directly incorporates concepts such as entropy, dissipation and energy minimisation. Currently such systems are being investigated in simulation and some first generation of thermodynamic chips are being developed [4].

These paradigms give a glimpse of the rapidly evolving landscape of physical computing and readers are encouraged to explore them further. Addressing the computing challenges we face today requires our community to look beyond traditional digital architectures and embrace new models grounded in physics. Physical computing allows for encoding of information in continues variables such as probability distribution, oscillator phases, or thermodynamic states allowing the computation to unfold following the laws of physics while offering new pathways for energy-efficient, scalable and application-specific computing architectures that can meet the demands of modern workloads.

References:

[1] Giovanni Finocchio et al 2024 Nano Futures 8 012001
[2] Aadit, N.A., Grimaldi, A., Carpentieri, M. et al. Massively parallel probabilistic computing with sparse Ising machines. Nat Electron 5, 460–468 (2022). https://www.nature.com/articles/s41928-022-00774-2
[3] Todri-Sanial, A., Delacour, C., Abernot, M. et al. Computing with oscillators from theoretical underpinnings to applications and demonstrators. npj Unconv. Comput. 1, 14 (2024). https://doi.org/10.1038/s44335-024-00015-z
[4] Melanson, D., Abu Khater, M., Aifer, M. et al. Thermodynamic computing system for AI applications. Nat Commun 16, 3757 (2025). https://doi.org/10.1038/s41467-025-59011-x

Paper Deadlines

FPT'26 - Int'l Conference on Field-Programmable Technology
Honolulu, Hawaii
Abstracts due: June 5, 2026
Deadline: June 12, 2026
Dec. 7-10, 2026
http://icfpt.org

iSES'26 – IEEE Int'l Symposium on Smart Electronic Systems
Goa, India
Deadline: June 6, 2026
Dec. 15-17, 2026
http://www.ieee-ises.org

ASP-DAC'27 - Asia and South Pacific Design Automation Conference
Tokyo, Japan
Abstracts due: July 3, 2026
Deadline: July 10, 2026
Jan. 25-28, 2027
http://www.aspdac.com

ISSCC'27 – IEEE Int'l Solid-State Circuits Conference
San Francisco, CA
Deadline: Sept. 9, 2026
Feb. 14-18, 2027
http://isscc.org

SIGDA Partner Journal

ACM Transactions on Design Automation of Electronic Systems (TODAES) features groundbreaking research and development in the specification, design, analysis, simulation, testing, and evaluation of electronic systems, with a focus on computer science and engineering. The journal's impact factor increased to 2.2 in 2023, more than doubling its value from 2020. Additionally, each issue highlights a notable contribution as the Editor's Pick for special recognition.

TODAES also recognizes papers and outstanding junior researchers through the best paper and rookie of the year awards. Authors can send their paper submissions to the manuscript portal.

TODAES welcomes special issue proposals from leading researchers and practitioners. Such proposals should be emailed to Prabhat Mishra, Senior Associate Editor, at prabhat@ufl.edu

Call for Special Issue on Advances in Physical Design Automation
Submission Deadline: EXTENDED to July 22, 2026
For questions and further information, please contact the guest editors at:
- Rickard Ewetz, rewetz@ufl.edu
- Tung-Chieh Chen, donchen@synopsys.com
- Stephan Held, held@dm.uni-bonn.de
- Gracieli Posser, gposser@cadence.com

Call for Special Issue on Open, Reliable, and Generalizable Datasets for AI in EDA
Submission Deadline: August 31, 2026
For questions and further information, please contact the guest editors:
- Qi Sun, Zhejiang University, qisunchn@zju.edu.cn
- Tsung-Yi Ho, The Chinese University of Hong Kong, tyho@cse.cuhk.edu.hk
- Grace Li Zhang, TU Darmstadt, grace.zhang@tu-darmstadt.de
- Haoyu Yang, NVIDIA, haoyuy@nvidia.com

TODAES SIGDA Paper Highlight

We encourage you to explore our January-February 2026 highlighted paper,

MFIT: Multi-FIdelity Thermal Modeling for 2.5D and 3D Multi-Chiplet Architectures

Lukas Pfromm[1], Alish Kanani[1]*, Harsh Sharma[2], Parth Solanki[1], Eric Tervo[1], Jaehyun Park[3], Janardhan Rao Doppa[2], Partha Pratim Pande[2], Umit Y. Ogras[1]*

**Equal Contribution*

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(Link: https://dl.acm.org/doi/full/10.1145/3765905)

Upcoming Conferences

GLSVLSI'256– ACM Great Lakes Symposium on VLSI
Finger Lakes, NY
June 22-24, 2026
http://www.glsvlsi.org

ICECET'26 - IEEE International Conference on Electrical, Computer and Energy Technologies
Rome, Italy
July 6-9, 2026
www.icecet.com

ISVLSI'26 – IEEE Computer Society Annual Symposium on VLSI
Kolkata, India
July 7-10, 2026
http://www.ieee-isvlsi.org

DAC'26 – Design Automation Conference
Long Beach, CA
July 26-29, 2026
http://www.dac.com/

ICLAD'26 - IEEE International Conference on LLM-Aided Design
Standford, CA
July 30-31, 2026
https://iclad.ai/

ISLPED'26 – ACM/IEEE Int'l Symposium on Low Power Electronics and Design
Chicago, IL
Aug. 5-7, 2026
http://www.islped.org

MLCAD'26 - ACM/IEEE Workshop on Machine Learning for CAD
Jeju Island, Korea
Sep. 7-9, 2026
https://mlcad.org/symposium/

SIGDA Vision 2030

ACM SIGDA is launching SIGDA Vision 2030, a community-driven initiative to identify key challenges and define strategic priorities for the Design Automation field.

You can contribute by completing a short survey (5-10 minutes): https://bit.ly/SIGDA-Vision-2030-Survey

The input collected will be discussed in upcoming interactive sessions at major conferences (including DATE, DAC, and ICCAD) and will contribute to a strategic report outlining priorities and concrete actions for the coming years. Your input is extremely valuable in shaping the future of the community.

Technical Activities

1. **OpenAI Reportedly Eyes AI-Native Smartphone Market with 2028 Launch Plan**

ChatGPT creator OpenAI is working closely with Qualcomm and MediaTek to develop processors for an AI-first smartphone, which is reportedly co-designed and manufactured by China's Luxshare with a launch planned in 2028…

2. **Altera Advances Reconfigurable Optical Modem Development for DIU's RAZORBAC Initiative**

Altera will develop Agilex FPGA-based coherent optical modem technology supporting resilient, interoperable multi-domain communications networks worldwide…

3. **Where AI Actually Delivers in Design Verification**

AI has moved from theory to practical assistance in parts of design verification. This matters because verification remains one of the most time- and resource-intensive parts of front-end IC development, with functional verification still consuming the largest share of effort in many real workflows. The attraction is clear: Any tool that can reduce manual debugging, accelerate coverage closure, or shorten regression cycles will get serious attention from engineering teams. The scale of this opportunity becomes clearer when the distribution of effort across the front-end workflow is examined…

4. **Rethinking System Design Amid the DRAM Crunch**

Rising DRAM costs and tightened supply are forcing a rethink of AI workloads, with edge architectures offering a more resilient, lower-memory alternative…

Job Positions

Argonne National Laboratory, US

Job Title: Research Assistant in Computer Science

VLSI-SoC'26 – IFIP/IEEE Int'l Conference on Very Large Scale Integration
Limassol, Cyprus
Oct. 11-14, 2026
http://www.vlsi-soc.com

MICRO'26 – IEEE/ACM Int'l Symposium on Microarchitecture
Athens, Greece
Oct. 31 - Nov. 4, 2026
http://www.microarch.org/micro59

ICCAD'26 – IEEE/ACM Int'l Conference on Computer-Aided Design
San Jose, CA
Nov 8-12, 2026
https://iccad.com/

ICCD'26 – IEEE Int'l Conference on Computer Design
Hong Kong, China
Nov. 16-18, 2026
http://www.iccd-conf.com

Description: The Advanced Photon Source (APS) at Argonne National Laboratory invites applicants for an assistant computational scientist staff position to develop and apply artificial intelligence (AI) and machine learning (ML) methods for x-ray spectroscopy and spectromicroscopy. This role will focus on advancing the state-of-the-art in spectroscopy across fluorescence mapping and imaging, x-ray absorption near-edge structure (XANES), extended x-ray absorption fine structure (EXAFS), and related multimodal spectroscopy workflows. The successful candidate will: Lead a research program focused on creating novel computational methods and AI-driven approaches for challenging analysis and inverse problems in x-ray spectroscopy. Be responsible for developing and implementing advanced algorithms and AI/ML models for denoising, deconvolution, spectral fitting, unmixing, chemical-state identification, uncertainty-aware interpretation, and multimodal data fusion across fluorescence, XANES, EXAFS, and related experiments, with the goal of accelerating data analysis, improving quantitative accuracy, and enabling autonomous experiments. Explore the use, adaptation, and fine-tuning of modern foundation models for scientific data analysis, representation learning, and multimodal reasoning in x-ray science. Work closely with beamline scientists and participate in data-intensive experiments, reporting results in high-impact publications and at international conferences. May be required to perform other duties as assigned. For more information, please refer to https://facultyvacancies.com/research-assistant-in-computer-science,i45798.html.

ETH Zürich, Singapore

Job Title: Postdoctoral Researcher in OCCL

Description: The current era of artificial intelligence is predominantly driven by advances in computational power and infrastructure. As models scale to unprecedented sizes, their capabilities are enhanced through strategies such as reinforcement learning (RL) and innovative frameworks like the "graph of thoughts". We are firmly in the "Age of Computation", where breakthroughs in AI are synonymous with the ability to harness and optimize massive computational resources. However, this rapid growth in computational demands comes with a critical challenge: energy limitations. Around the globe, new power plants are being constructed to meet the demands of AI workloads, underscoring the urgent need for efficiency to ensure these advancements benefit humanity sustainably. Especially in Singapore, such resources may be scarce and hinder the ability of the country's researchers to advance in this most important field. The Postdoctoral Researcher will be co-leading the development of a novel open-source accelerator communication library (OCCL). This communication library should support point-to-point as well as collective communication calls. It should allow communication initiated by the host, as well as communication initiated within accelerator device kernels. It should support a wide range of devices and network substrates, such as NVLINK and next-generation ethernet networks. For more information, please refer to https://facultyvacancies.com/postdoctoral-researcher-in-occl,i45668.html.

Iowa State University, US

Job Title: Research Assistant in Electrical Engineering

Description: The Department of Electrical and Computer Engineering (ece.iastate.edu), in the College of Engineering at Iowa State University, invites applications for the position of Research Assistant Professor. This is a 3-year term research faculty position that holds responsibilities primarily contributing to the research mission of the department through scholarly impact and an externally funded research program in the areas of wireless and network systems. Specifically, besides contributing to the research, education, and innovation projects led by the Center for Wireless, Communities and Innovation (wici.iastate.edu), the responsibilities include mentoring graduate and undergraduate students working on research and design projects. Successful candidates will have experience that demonstrates exceptional ability or potential to produce scholarship, compete for and secure funding from external sources, and the capability for long-term leadership in their research field. They will also exhibit excellent communication skills. For more information, please refer to https://facultyvacancies.com/research-assistant-in-electrical-engineering,i45608.html.

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