Communiqués de presse

IBM Research Alliance produit la première puce Node Test de 7 nm du marché

Une avancée majeure ouvre la voie à une nouvelle génération de processeurs au SUNY Polytechnic Institute

Paris - 09 juil. 2015: IBM Research annonce aujourd'hui la production de la première puce de l'industrie des semi-conducteurs correspondant au nœud technologique 7 nm avec transistors fonctionnels, en collaboration avec ses partenaires GlobalFoundries, Samsung et les équipementiers au SUNY Polytechnic Institute's Colleges of Nanoscale Science and Engineering à Albany, NY.

Le développement du nœud technologique de 7 nm est l'un des plus grands défis de l'industrie des semi-conducteurs, demeuré longtemps hors de portée à cause d'obstacles technologiques fondamentaux. Jusqu'ici, les recherches menées pour atteindre des dimensions aussi réduites que celles du nœud 7 nm (par comparaison, l'ADN humain fait 2,5 nm de diamètre) tout en utilisant des procédures conventionnelles, ont résulté en une dégradation de la performance des puces. Et cela même sans pouvoir profiter des avantages qu'offre la réduction de taille sur les coûts de fabrication, la consommation d'énergie ainsi que sur les performances.

Cette avancée majeure est le résultat direct de l'investissement de 3 milliards de dollars sur cinq années annoncé par IBM l'an dernier dans la R&D dans le domaine des puces électroniques, et ce afin d'asseoir son leadership dans l'innovation pour l'industrie des serveurs IBM. Cette progression survient dans le sillage de l'accord de collaboration conclu avec GlobalFoundries la semaine dernière. L'entité IBM Systèmes compte ainsi maintenir son leadership technologique pour les serveurs haut de gamme et continuer à fournir les semi-conducteurs les plus avancés grâce aux innovations réalisées par IBM Research.

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IBM Research Alliance Produces Industry's First 7nm Node Test Chips

Partners with GLOBALFOUNDRIES, Samsung and SUNY Polytech to Clear Path for Next Generation Semiconductors

ALBANY, N.Y. - 09 Jul 2015: An alliance led by IBM Research (NYSE:IBM) today announced that it has

produced the semiconductor industry's first 7nm (nanometer) node test chips with functioning transistors. The breakthrough, accomplished in partnership with GLOBALFOUNDRIES and Samsung at SUNY Polytechnic Institute's Colleges of Nanoscale Science and Engineering (SUNY Poly CNSE), could result in the ability to place more than 20 billion tiny switches -- transistors -- on the fingernail-sized chips that power everything from smartphones to spacecraft.

To achieve the higher performance, lower power and scaling benefits promised by 7nm technology, researchers had to bypass conventional semiconductor manufacturing approaches. Among the novel processes and techniques pioneered by the IBM Research alliance were a number of industry-first innovations, most notably Silicon Germanium (SiGe) channel transistors and Extreme Ultraviolet (EUV) lithography integration at multiple levels.

Industry experts consider 7nm technology crucial to meeting the anticipated demands of future cloud computing and Big Data systems, cognitive computing, mobile products and other emerging technologies. Part of IBM's $3 billion, five-year investment in chip R&D (announced in 2014), this accomplishment was made possible through a unique public-private partnership with New York State and joint development alliance with GLOBALFOUNDRIES, Samsung, and equipment suppliers. The team is based at SUNY Poly's NanoTech Complex in Albany.

"*For business and society to get the most out of tomorrow's computers and devices, scaling to 7nm and beyond is essential,"* said **Arvind Krishna, senior vice president and director of IBM Research** . *"That's why IBM has remained committed to an aggressive basic research agenda that continually pushes the limits of semiconductor technology. Working with our partners, this milestone builds on decades of research that has set the pace for the microelectronics industry, and positions us to advance our leadership for years to come."*

Microprocessors utilizing 22nm and 14nm technology power today's servers, cloud data centers and mobile devices, and 10nm technology is well on the way to becoming a mature technology. The IBM Research-led alliance achieved close to 50 percent area scaling improvements over today's most advanced technology, introduced SiGe channel material for transistor performance enhancement at 7nm node geometries, process innovations to stack them below 30nm pitch and full integration of EUV lithography at multiple levels. These techniques and scaling could result in at least a 50 percent power/performance improvement for next generation mainframe and POWER systems that will power the Big Data, cloud and mobile era.

"Governor Andrew Cuomo's trailblazing public-private partnership model is catalyzing historic innovation and advancement. Today's announcement is just one example of our collaboration with IBM, which furthers New York State's global leadership in developing next generation technologies," said **Dr. Michael Liehr, SUNY Poly Executive Vice President of Innovation and Technology and Vice President of**

Research. *“Enabling the first 7nm node transistors is a significant milestone for the entire semiconductor industry as we continue to push beyond the limitations of our current capabilities.”*

"Today’s announcement marks the latest achievement in our long history of collaboration to accelerate development of next-generation technology," said **Gary Patton, CTO and Head of Worldwide R&D at GLOBALFOUNDRIES**. *"Through this joint collaborative program based at the Albany NanoTech Complex, we are able to maintain our focus on technology leadership for our clients and partners by helping to address the development challenges central to producing a smaller, faster, more cost efficient generation of semiconductors."*

The 7nm node milestone continues IBM’s legacy of historic contributions to silicon and semiconductor innovation. They include the invention or first implementation of the single cell DRAM, the Dennard Scaling Laws, chemically amplified photoresists, copper interconnect wiring, Silicon on Insulator, strained engineering, multi core microprocessors, immersion lithography, high speed SiGe, High-k gate dielectrics, embedded DRAM, 3D chip stacking and Air gap insulators.

IBM and SUNY Poly have built a highly successful, globally recognized partnership at the multi-billion dollar Albany NanoTech Complex, highlighted by the institution's Center for Semiconductor Research (CSR), a $500 million program that also includes the world's leading nanoelectronics companies. The CSR is a long-term, multi-phase, joint R&D cooperative program on future computer chip technology. It continues to provide student scholarships and fellowships at the university to help prepare the next generation of nanotechnology scientists, researchers and engineers.

For more information about SUNY PolytechnicInstitute, visit www.sunycnse.com and www.sunypoly.edu.

For more information on IBM Research, visit www.research.ibm.com.
