

3D Integration and Interconnect-Centric Architectures

Tentative Program

8:00-8:30	Breakfast and Registration
8:30-8:40	Opening Remarks: Yuan Xie (Penn State) and Eren Kursun (IBM Research)
	Session 1: Invited Talks
8:40-9:20	System Implications of Integrated Photonics Norm Jouppi, (Hewlett-Packard)
9:20-10:00	Memory Rich Application Exploration for 3D Integration Paul Franzon, (North Carolina State University)
10:00-10:30	Coffee Break and Networking
	Session 2: 3D Memory Architecture
10:30-10:55	Multi-Core Computer Memory Hierarchy Design using Heterogeneous 3D Stacked DRAM Hongbin Sun, Jibang Liu, Nanning Zheng, James Luy, Ken Rosey, and Tong Zhang (Xi'an Jiaotong University and Rensselaer Polytechnic Institute)
10:55-11:20	Power and Performance Evaluation for 3D hybrid cache with Non-volatile memory Xiaoxia Wu, Jian Li, Lixin Zhang, Evan Speight, Yuan Xie, (IBM ARL and Penn State)
11:20-11:45	Interconnect and Memory Tradeoffs in a Distributed FFT Processor Architecture for Synthetic Aperture Radar in 2D-IC and 3D-IC Thorlindur Thorolfsson, Kiran Gonsalves, Paul Franzon (North Carolina State University)
11:45-1:00	Lunch
	Session 3: Invited Talks
1:00-1:40	Architecture Implications of 3D Integration and Other Technologies Dr. Philip Emma, (IBM Research)
1:40-2:50	Panel Discussion: "Is 3D really a viable next step?" Prof. Yale Patt, Dr. Norman Jouppi, Dr. Philip Emma, Prof. Paul Franzon, Prof. Hsien-Hsin Lee
2:50-3:15	Coffee Break and Networking
	Session 4: 3D ICs and Network-on-chip Architectures
3:15-3:40	Variation Aware Routing for Three-Dimensional FPGAs Chen Dong, Scott Chilstedt, and Deming Chen, (UIUC)
3:40-4:05	3D IO interface design between memory and Logic Dies on TSV interconnects Marco Facchini, Paul Marchal, Wim Dehaene, (IMEC and Katholieke University Leuven)
4:05-4:30	Save Your Energy: A Fast and Accurate Approach to NoC Power Estimation Christopher Mineo and W. Rhett Davis, (North Carolina State University)
4:30-4:55	Comparative Analysis of Worst-Case Communication Delay Bounds for 2D and 3D NoCs Yue Qian, Zhonghai Lu, and Wenhua Dou, (National Univ. of Defense Technology in China and KTH in Sweden)

Invited Talk: System Implications of Integrated Photonics

Norm Jouppi, Director of the Exascale Computing Lab, HP Lab



Norman P. Jouppi received his Ph.D. in electrical engineering from Stanford University in 1984, and a master of science in electrical engineering from Northwestern University in 1980. He is a fellow and director of the Exascale Computing Lab at HP Labs, the company's central research and development arm, overseeing research on building next-generation hardware and software compute infrastructure using a cross-layer inter-disciplinary approach. Jouppi joined HP in 2002 from Compaq Computer Corp., where he was a staff fellow at Compaq's Western Research Laboratory in Palo Alto, Calif. From 1984 through 1996, he was a consulting assistant/associate professor in the department of electrical engineering at Stanford University, where he taught classes in VLSI, circuits and computer architecture. He currently serves as past chair of ACM Special Interest Group on Computer Architecture (SIGARCH), is on the ACM Council and on the Computing Research Association (CRA) board. He is on the editorial board of Communications of the ACM and IEEE Computer Architecture Letters, and is a fellow of the ACM and the IEEE. He holds more than 35 U.S. patents. He has published over 100 technical papers, with several best paper awards and one International Symposium on Computer Architecture (ISCA) Influential Paper Award.

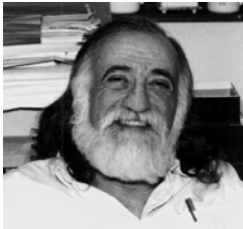
Invited Talk: Architecture Implications of 3D Integration and Other Technologies

Philip Emma, Master Inventor/Manager of Technology and Microarchitecture Group, IBM Research



Philip Emma received B.S., M.S., and Ph.D. degrees in electrical engineering from the University of Illinois, joining the IBM T. J. Watson Research Center in 1983. Since then, he has done extensive work in the areas of computer microarchitecture, computer architecture, systems design, circuit design, electronic packaging, materials, interconnection technology, and optics. He led the definition and design of the R-unit on the first IBM CMOS processors for IBM zSeries* machines and was responsible for the reliability and infrastructure that makes the zSeries machines the premier brand for reliable computing in the industry. Dr. Emma has written more than 200 technical articles and several book chapters, he holds 35 Invention Plateaus and more than 100 patents, and he has received several corporate awards for his technical work. He is an IBM Master Inventor, a member of the IBM Academy of Technology, and a Fellow of the Institute of Electrical and Electronics Engineers. He is currently Manager of the IBM Systems Technology and Microarchitecture Group.

Panelist: Yale Patt, Professor, University of Texas Austin



Yale Patt is a teacher at The University of Texas at Austin, where he also directs the research of nine PhD students, while enjoying an active consulting practice with several microprocessor manufacturers. He teaches the required freshman intro to computing course to 400 first year students every other fall, and the advanced graduate course to PhD students in microarchitecture every other spring. His research ideas (HPS, branch prediction, etc.) have been adopted by almost every microprocessor manufacturer on practically every high end chip design of the past ten years. Yale Patt has earned the appropriate degrees from reputable universities and has received more than his share of prestigious awards for his research and teaching. More detail on his interests and accomplishments can be obtained from his web site: www.ece.utexas.edu/~patt

Invited Talk: Memory Rich Application Exploration for 3D Integration

Paul Franzon, Professor, North Carolina State University



Paul D. Franzon earned his Ph.D. from the University of Adelaide, Adelaide, Australia in 1988. He has worked at AT&T Bell Laboratories, DSTO Australia, Australia Telecom and two companies he cofounded, Communica and LightSpin Technologies. His current interests center on the technology and design of complex systems incorporating VLSI, MEMS, advanced packaging and molecular electronics. Application areas currently being explored include novel advanced packaging structures, Network Processors, SOI baseband radio circuit design for deep space, on-chip inductor and inductance issues, RF MEMS, and moleware circuits and characterization. He has lead several major efforts and published over 120 papers in these areas. In 1993 he received an NSF Young Investigators Award, in 2001 was selected to join the NCSU Academy of Outstanding Teachers, in 2003, selected as a Distinguished Alumni Professor, and in 2005 won the Alcoa award. He is a Fellow of the IEEE.

Panelist: Professor Hsien-Hsin Sean Lee, Georgia Institute of Technology



Hsien-Hsin S. Lee received his BSEE from National Tsinghua University, and his MSE and PhD from the University of Michigan at Ann Arbor. He is an Associate Professor of the School of Electrical and Computer Engineering at Georgia Tech and serving the first Associate Director of the new Center of Manycore Computing at Georgia Tech. His current research interests include computer architecture, 3D Integrated Circuits, low-power VLSI, and information security. Prior to joining academia, he was a processor architect at Intel Corporation and later the architecture manager of StarCore DSP Technology Center of Agere systems and Motorola. Dr. Lee's doctoral thesis was awarded the Horace H. Rackham School Distinguished Dissertation Award at the University of Michigan and has co-authored three papers that won the Best Paper Awards at MICRO-33, CASES-04, and IBM PAC². Dr. Lee received a DOE Early CAREER PI Award, NSF CAREER Award, and Georgia Tech's ECE Outstanding Jr. Faculty Member Award. He holds 4 U.S. patents
