Special issue on Monolithic 3D: Technology, Design and Computing Systems Applications Perspectives

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Scope and Purpose:

Over the last 50 years, Computing Systems have successfully surfed the Moore's law wave. Today, we observe a clear stagnation in this miniaturization race while a new generation of applications (such as Artificial Intelligence) are producing unprecedented amounts of raw data. To overcome this major challenge, new technologies aiming at revising classical Computing Architecture that are continuously moving data from the processing unit to memory are essential. Monolithic-3D technology (M3D) has the potential to improve the energy efficiency of new computing architectures. Indeed, thanks to its nano-scale Monolithic Inter Tier Via that is 100x smaller than state of the art Through Silicon Vias, M3D opens the door for new computing systems immersed in memory.

Currently, there is much effort spent on M3D technology development and system-level design. Yet, numerous challenges remain. For example, the development of "cold process" to monolithically fabricate a reliable device on top of another one. Another challenge is on the understanding of the physical issues (electro-thermal) and design of energy efficient and reliable M3D systems. Ultimately, CAD tools for planar technology must be adapted for M3D to enable new computing architectures for large on-chip memory bandwidth. This special issue aims at addressing these problems to speed up the emergence of High Energy Efficient Computing Systems.

Topics of Interest:
This special issue is looking for innovative research on Monolithic 3D computing systems over multiple scales of circuit design, microarchitecture, system applications and software development. The areas of interests include but not limited to:

• Systems and applications
• Hardware architectures and micro architectures
• Hardware – Software co-design
• Model and simulation
• Design tools and framework, covering any of architecture – circuit - technology levels.
• Reliability and Testability

Interested authors should submit their papers to mc.manuscriptcentral.com/jetc, and select the paper type "Special Issue on Monolithic 3D." The author guidelines can be found at jetc.acm.org/authors.cfm.

Important Dates
• Manuscript submissions due: September 30, 2020
• First round of reviews completed: November 11, 2020
• Revised manuscripts due: December 15, 2020
• Second round of reviews completed: January 1, 2021
• Final manuscripts due: January 3, 2021

For questions or further information, please contact jetc.monolithic3d-editors@acm.org.