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Kunal Bhatnagar is currently serving as a Senior Process Engineer at ASM America, Inc. with their Advanced ALD Process & Application Development unit in Phoenix, AZ. Kunal graduated from Texas State University with a PhD in Materials Science, Engineering and Commercialization in August 2015 under the supervision of *IEEE Fellow*, Dr. Ravi Droopad. He also holds a Master's degree in Electrical & Computer Engineering from the University of Missouri in Columbia, and a Bachelor's degree in Physics from Angelo State University. In the past, he has been involved in numerous research areas including the fabrication of plasmonic nanostructures, thin film optical metrology, and the investigation of III-V semiconductor heterostructures for post-Si CMOS applications. At ASM, Kunal is part of a team that focuses on unit process development, including equipment design and process technology for 300 mm ALD tools for high-volume manufacturing at semiconductor fabs. He was inducted in the National Physics Honor Society "Sigma Pi Sigma" in 2010 and has authored numerous publications in peer-reviewed journals as well as a utility patent granted by the United State Patent and Trademark Office.

Abstract

"*A Glance into the Semiconductor Industry as a New PhD Graduate*"

The global semiconductor industry is roughly worth $336 billion and continues to be one of the key drivers for economic growth with its role as a technology enabler. I will share my experience as a new college grad in the semiconductor industry and what it is like to work for a semiconductor tool vendor. Not without its challenges and shortcomings, it can be a great place to learn, adapt, and be a part of something unique.

"*ALD for 300 mm High-volume Manufacturing Applications in Microelectronics*"

Atomic Layer Deposition (ALD) has emerged as a key technology enabler for the fabrication of ultrathin and conformal semiconductor thin films for applications in leading-edge Complementary Metal Oxide Semiconductor (CMOS) logic, Dynamic Random Access (DRAM), and NAND Flash memory products. ALD is a variant of chemical vapor deposition (CVD) that uses sequential self-limiting surface chemistry to achieve sub-monolayer thickness control. With the incorporation of new materials and 3D architectures in advanced technology nodes, ALD provides uniformity, conformality and interface control for high-quality devices. ASM's patented ALD technology portfolio consists of the Pulsar module used for high-k dielectric materials in advanced CMOS transistor gates and the EmerALD process module for thin conformal metal gate stacks for 300 mm HVM applications. As we move towards smaller technology nodes in both logic and memory applications, ALD will continue to play an important role in the development of next-generation microelectronics.