

# Monday Morning, July 22, 2019

## Plenary Session

### Room Grand Ballroom A-G - Session PS2-MoM

#### ALE Plenary Session

**Moderators:** Craig Huffman, Micron, Gottlieb S. Oehrlein, University of Maryland, College Park

11:00am **PS2-MoM-11 Mapping the Future Evolution of Atomic Scale Processing to enable the World of Artificial Intelligence, *Eric A. Joseph***, IBM T.J. Watson Research Center **INVITED**

Advances in the semiconductor industry, historically based on Moore's Law and Dennard scaling, have become progressively challenging as device technology moves beyond the 7nm node. The ever-continuing trend to shrink device size, coupled with the introduction of novel materials, multi-component materials and/or nanoscale materials has driven the need for the ultimate solution: atomic scale precision. To meet this demand, considerable work has been underway to incorporate advances in atomic layer etching (ALE), atomic layer deposition (ALD), and area selective techniques to meet process requirements. However, as future technology undergoes a paradigm shift away from Moore's Law towards accelerator technologies for AI applications, the types of process driven challenges will also change. This transition will require a revised focus on process capability, expanding beyond traditional process enhancements, to minimizing process induced device performance degradation. Examples of this paradigm shift will be discussed in detail and a vision for the future challenges of atomic scale processes will be reviewed.

## Author Index

**Bold page numbers indicate presenter**

— J —

Joseph, E: PS2-MoM-11, **1**