Monday Morning, July 22, 2019

Plenary Session
Room Grand Ballroom A-G - Session PS1-MoM

ALD Plenary Session

Moderators: Sumit Agarwal, Colorado School of Mines, Dennis Hausmann, Lam Research

8:45am **PS1-MoM-2 Atomic Scale Processing: From Understanding to Innovation***, Erwin Kessels,* Eindhoven University of Technology, Netherlands **INVITED**

Atomic scale processing is the collective term for processing methods that are currently more and more being explored – and industrially employed – to prepare thin films and nanostructures in a highly controllable way with atomic scale precision. Atomic layer deposition (ALD) and atomic layer etching (ALE) are two prominent examples but also state-of-the-art nanopatterning and area-selective deposition (ASD) approaches can in many cases be regarded as examples of atomic scale processing. In this presentation, I will address several recent and emerging trends in atomic scale processing and discuss how understanding of the underlying mechanisms has contributed to important innovations in the field, either in research or in industry. Application areas to be addressed are especially nanoelectronics and photovoltaics which I will discuss from my own experience and perspective. Topics to be discussed are: (i) the growing importance of plasma ALD, aspects such as conformality and the role (and control) of ions; (ii) the necessity of in situ metrology methods (e.g. in situ spectroscopic ellipsometry) for process monitoring and advanced surface spectroscopy for obtaining more quantitative insight into fundamental parameters; (iii) the use of ALD in nanopatterning and the interest in area-selective ALD including those combinations with intermediate etch steps; and (iv) the need for isotropic and anisotropic ALE, either thermal or plasma-based.

9:30am **PS1-MoM-5 Plenary-ALD Elam***, Jeffrey W. Elam,* Argonne National Laboratory **INVITED**

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