EUV Lithography And The Materials That Propel It Forward

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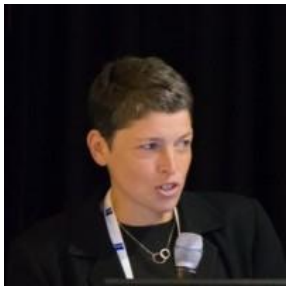
Use of EUV lithography in manufacturing should not be confused with EUV lithography development completed. Imec's industry roadmaps clearly show EUV inserted for N7 and beyond using both single and double patterning strategies. This achievement of patterning strategies and resolution is important, but that achievement relies on fundamental development in materials. In this keynote, the EUV roadmaps will be introduced and patterning accomplishments described. Then more time will be devoted to the role of materials in enabling EUV lithography. More specifically, EUV resists, mask absorbers and EUV pellicle membranes will be used to demonstrate how fundamental material studies are needed to propel the semiconductor industry roadmap forward. EUV photoresist materials not only enable resolution, but also are key to controlling stochastic defects. Mask absorbers can be modified to enhance NILS and minimize mask 3D effects. Finally, yield is a critical component to any semiconductor wafer manufacturing solution and a high-transmission, EUV pellicle is essential to preserving high yield on the EUV processes that the industry worked so hard to develop. Foundational material selection and recent updates on the EUV pellicle will be included.

Presenting Author



Emily Gallagher is a Principal Member of Technical Staff at imec, focusing on pellicle membrane development, EUV imaging and photomasks. Emily received her PhD in physics studying free electron lasers at Dartmouth School of Graduate and Advanced Studies before shifting to the semiconductor industry and IBM where her work ranged from electrical wafer characterization to lithography. She led the EUV mask development work for IBM before joining imec in 2014. She has collaborated on ~100 technical papers, holds ~30 patents and is an SPIE Fellow.