Laser Produced Plasma EUV Source for Semiconductor Lithography Applications

Dr. Michael Purvis, EUV Source Program at ASML

In this talk, we provide an overview of laser-produced-plasma (LPP) extreme-ultraviolet (EUV) sources to enable next generation lithography for high volume manufacturing of advanced semiconductor devices. Source architecture and plasma fundamental that facilitated the increase of EUV power from 100W to 250W will be shown, and the technical challenges for power scaling of key source parameters and subsystems. The theory of operation of critical subsystems such as the Droplet Generator and Collector protection will be shown, with emphasis on stability and lifetime. Finally, we will describe current research activities and provide a perspective for scaling LPP EUV sources towards 500W.

Speaker: Michael Purvis, Ph. D

Michael Purvis serves as the Systems Power Architect for the EUV Source Program at ASML San Diego. Dr. Purvis received his B.A, M.S. and Ph.D. degrees in Electrical and Computer Engineering from Colorado State University. His thesis work was performed at the National Science Foundation Engineering Research Center for Extreme Ultraviolet Light. Over the last decade, Michael has published numerous times in the field of laser created plasmas, including publications in the journal Nature. His initial investigations at Colorado State University included developing discharge and laser produced EUV lasers for applications in plasma diagnostics; subsequent to this he worked on theoretical plasma modeling and high energy density plasma experiments at CSU, Lawrence Livermore National Labs and SLAC. Michael is currently applying his experience with laser produced plasma towards the development of EUV light sources at ASML. His work at ASML is focused on scaling EUV power output to meet semiconductor industry requirements for high volume manufacturing.