**EUV development at ZEISS SMT: enabling the new era of EUV lithography**

Renzo CAPELLI, *Carl Zeiss SMT GmbH*

Over the last two decades, the semiconductor industry brought EUV lithography from a status of high risk project to being a reliable and production worthy technology. EUV is currently adopted by major semiconductor players worldwide, contributing to the development of the whole infrastructure for the further extension of Moore's law. ZEISS SMT and ASML set up a strategic partnership which enabled to introduce EUV into production by the end of the last decade for first production of critical layers, and later to extend the roadmap to further improve throughput, resolution and overlay. With a numerical aperture (NA) of 0.33, NXE EUV scanners are printing wafers in foundries worldwide with very high reliability. ASML and ZEISS have also designed and started manufacturing the next generation EUV exposure tool, the EXE:5000 scanner. With a NA of 0.55, the EXE:5000 scanner system will support the further node scaling roadmap by improving image contrast and therewith reduce feature CD and uniformity while improving defect print rate on product wafer.

As for all major steps in the lithography evolution, the whole infrastructure will develop further in order to support this next quantum leap in EUV technology, with the EUV photomask technologies and metrology tools representing an essential piece of the mosaic.

This contribution will give an overview of the development of optical lithography within the last decades, with a special focus on EUV 0.33NA exposure tools and status towards the upcoming introduction of next generation 0.55 NA EUV scanner. We will also give an overview of the evolution of the EUV ecosystem readiness, with focus on photomasks and metrology systems