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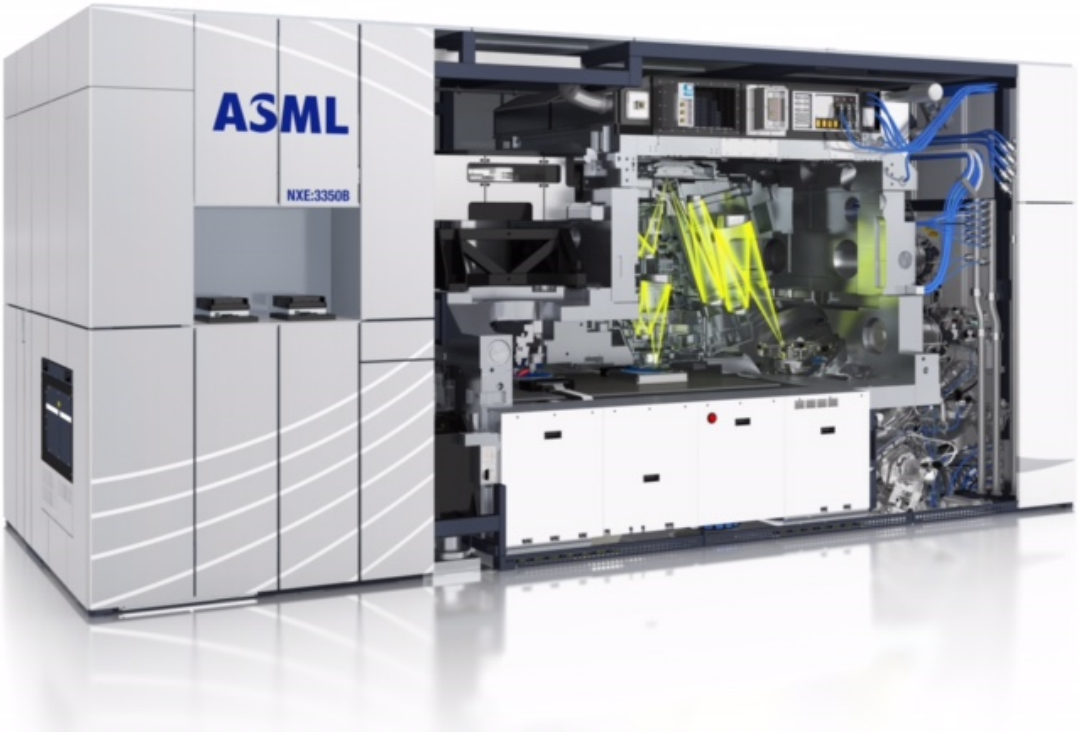
OPTICS & PHOTONICS
UNIVERSITY OF NOTTINGHAM

Optics and Photonics Group
Lunchtime Seminar

"Light source in ASML's EUV Photolithography Systems"

Pieter Smid

Advanced Semiconductor Materials International, Netherlands



13:30 Wednesday 13 July 2022
C24 Coates building
All Welcome

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MS Teams link

EUV lithography is used to pattern the finest details on the most advanced microchips. Microchips are made by building up complex patterns of transistors, layer by layer, on a silicon wafer. ASML's lithography systems are central to that process. A lithography (more formally known as 'photolithography') system is essentially a projection system. Light is projected through a blueprint of the pattern that will be printed (known as a 'mask' or 'reticle'). With the pattern encoded in the light, the system's optics shrink and focus the pattern onto a photosensitive silicon wafer. After the pattern is printed, the system moves the wafer slightly and makes another copy on the wafer.

Using a wavelength of 13.5 nm, ASML's EUV systems pattern the finest lines on microchips. They are used in high-volume manufacturing to create the highly complex foundation layers of the most advanced microchips. Leading-edge microchips contain billions of transistors. With each new generation, chipmakers pack in ever more and tinier transistors to make the chips more powerful, faster and energy efficient. EUV technology allows the semiconductor industry to continue its pursuit of Moore's Law. EUV systems are used to print the most intricate layers on a chip, with the rest of the layers printed using various DUV systems. Both types of technology will be required in parallel for many years to come and ASML is continuing to advance both technologies.

Because EUV lithography can pack more transistors onto a single chip, these chips can be mass produced affordably. They also have more processing brainpower, use less energy and have higher performance. In turn, this is enabling smart cars, phones and homes, augmented reality and voice recognition solutions, and much more.

In this talk an overview of ASML's EUV lithography will be given. A particular focus will be set on the EUV source and how the 13.5nm radiation is generated in an EUV scanner.