Present and Future of EUV lithography

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ABSTRACT

EUV scanners have been adopted worldwide for High-Volume Manufacturing (HVM) of 10-20 nm lithographic structures. Last year, the next generation of EUV scanners has started shipping, extending the resolution to feature sizes of below 10 nm.
Work has started on extending the resolution limits further by increasing the NA – and possibly even further by reducing the wavelength below 13.5 nm.

In parallel, the EUV source power has increased steadily, and this year the milestone of 1000 W has been achieved. While this enables high throughput and improves efficiency, both in terms of cost and in energy per wafer, this brings challenges to materials, manufacturing methods and cleaning.
Also in imaging, the increasing source powers require explicit consideration of heating and contrast loss due to spurious out-of-band wavelengths.

This presentation will give a comprehensive overview of the possibilities and challenges of EUV imaging, and the future directions being considered.
Also some of the physical and chemical interactions between the EUV photons and EUV-induced plasma with construction materials will be addressed, and the off-line testing requirements driven by those interactions.