# EUVL: Current Status & Remaining Challenges
## *(Keynote Presentation)*

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Advantages of EUV lithography are wide process windows, high throughput and extendibility. Disadvantages of EUV lithography are higher costs & complexity (than ArFi lithography) and relative infrastructure immaturity. Source availability and source power at the intermediate focus are not yet at the levels needed for single exposure EUV cost-of-ownership (CoO) comparable to multiple patterning 193i CoO when used for printing at the 7LP node. Resist resolution and sensitivity are close to spec: resist line-width-roughness (LWR) is not. LWR reduction via post processing will almost certainly be required. Mask blank defectivity and yield are continuing to improve: defect repair, defect avoidance, and defect compensation techniques are still needed for finite mask yield and actinic tools are needed for blank inspection, pattern mask inspection, and defect repair verification.

After more than 30 years of development, EUV topics that still need additional work include: source and scanner availability, pellicle transmission, and resist LWR/LCDU reduction. If not addressed, stochastic effects (photon shot noise, resist molecular inhomogeneities, scattering event, etc.) will become the most significant limiter of lithographic scaling.

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Obert Wood is a Principal Member of Technical Staff in the Strategic Lithography Technology Department at GLOBALFOUNDRIES. He was a Member of Technical Staff at Bell Laboratories for 34 years and has extensive experience in extreme-ultraviolet lithography, ultra-high intensity lasers and laser surgery. Obert received his B.S., M.S. and Ph.D. Degrees from the University of California at Berkeley in Electrical Engineering in 1964, 1965 and 1969. He is author or co-author of 271 technical papers and inventor or co-inventor of 27 patents and is a fellow of the Optical Society of America and SPIE, a senior member of IEEE, and a member of the AAAS, the American Physical Society, and the American Vacuum Society.