SPECIAL COLLECTION ON

Extreme Ultraviolet Lithography

These papers were originally published in Proceedings of SPIE and the *Journal of Micro/ Nanolithography, MEMS, and MOEMS.* Citation information can be found on the first page of each article and on the Table of Contents.

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Special Collection on Extreme-Ultraviolet Lithography

In the drive to maintain scaling of semiconductor devices according to Moore's Law, extreme-ultraviolet lithography (EUVL) is the leading candidate among next-generation lithography (NGL) technologies to succeed 193-nm optical lithography employing water immersion. Today, leading-edge semiconductor companies are manufacturing their final generation of devices using 193-nm immersion lithography with single patterning per layer. While device scaling is possible with double- or multiple-patterning immersion lithography, single-patterning NGL technologies will provide tighter overlay capability, better critical dimension uniformity, and potentially a lower cost. Currently, EUVL is being developed by these very companies for insertion into high-volume manufacturing (HVM) within the next five years. Preproduction EUV scanners with a numerical aperture of 0.25 were made available to these companies mainly in the first half of 2011, and HVM EUV scanners with a numerical aperture of 0.33 are expected to start shipping in late 2012.

As development of EUVL continues, many papers are being published in conference proceedings and refereed journals, especially those organized and sponsored by SPIE. Some of them appear in the *Journal of Micro/Nano Lithography, MEMS, and MOEMS* (JM^3), where we recently published our Special Section on EUV Sources (Vol. 11, No. 2). Others appear in the proceedings of several lithography-related conferences that SPIE organizes throughout the year, including Advanced Lithography, BACUS, and Photomask Japan. We believe that many of these writings are of immense value to reserachers, engineers, and students in the field.

As interest in EUVL continues to grow, it will take some time before textbooks on this new technology are available to researchers, engineers, and students. Meanwhile, this special collection of EUVL papers will ease the reader's overwhelming task of sorting through volumes of technical papers to find good and original papers on specific topics of interest.

In this collection, we have selected papers from JM^3, as well as SPIE proceedings papers associated with Advanced Lithography, BACUS, and Photomask Japan. Our selection criteria include: (1) relevance to leading EUVL topics, (2) popularity as measured by number of downloads, and (3) timeliness, with most selected papers being published within the past three years.

We initially divided these papers into six sections: Overview, Source, Mask, Optics, Resist, and Contamination. We added Interferrometric Lithography as a seventh section after encountering several good papers on this subject. All papers from the JM^3 Special Section on EUV Sources (Vol. 11, No. 2) also appear in this collection.

We hope that this anthology will serve as a useful reference for researchers, engineers, and students working on EUVL in their quest to bring this technology to eventual HVM adoption.

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Editors