SPIE. ADVANCED LITHOGRAPHY

San Jose Convention Center
San Jose, California, United States
24 - 28 February 2019

Optical Microlithography XXXII

This conference has an open **call for papers:**

SUBMIT AN ABSTRACT
(SIGN IN REQUIRED)

Submission guidelines for Authors and Presenters

Important Dates

SHOW | HIDE

Abstract Due:
29 August 2018

Manuscript Due Date:
19 January 2019

Conference Committee

SHOW | HIDE

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Jongwook Kye, SAMSUNG Electronics Co., Ltd. (Korea, Republic of)

Conference Co-Chair

Soichi Owa, Nikon Corp. (Japan)

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Additional Conference Information

Conference Chair:
Jongwook Kye
GLOBALFOUNDRIES Inc. (USA)

Conference Co-Chair:
Soichi Owa
Nikon Corp. (Japan)

Call for Papers

For about 40 years now, optical projection lithography has reigned as the primary lithographic technology for semiconductor manufacturing. This has been possible due to the innovations, the integration of new technologies and the continuous improvement of manufacturing techniques. After the introduction of high NA ArF immersion technology, optical resolution limit remained almost constant, but scaling down of critical dimensions and pattern pitches has been continued by introducing multiple patterning technologies, such as Litho-Etch repetition (LE, LELE, LE^n) or self-aligned multiple patterning (SADP and SAQP).

For those multiple patterning methods, edge placement error (EPE) must be accurately controlled, requiring constant improvement in on-product overlay accuracy and CD uniformity (CDU) as lithographic shrinking progresses. Simultaneously, productivity improvement has been required to keep cost manageable as the industry uses more process layers.

While this has been going on, optical proximity correction (OPC) of mask patterns have been advanced in order to maintain large process windows. This evolved first to include source and mask optimization (SMO) and then inverse lithography technology (ILT). ILT of curvilinear mask patterns is becoming a realistic technique due to the recently available computational power and realization of multi-beam mask writers. As for the ILT calculation, artificial intelligence (AI) technologies, such as machine learning or deep neural network, are becoming important.

Most recently, the industry is using optical lithography combined with EUV lithography for manufacturing critical layers of semiconductors; on the other hand, optical lithography is still used by itself in many other areas of micro- and nanofabrication, including power semiconductors, silicon photonics, and flat panel displays. Many of these applications use alternative optical exposure techniques ranging from mask proximity printing or interference lithography to innovative direct laser write techniques and multi-wavelength lithography, including 3D patterning.

This conference welcomes abstract submissions covering topics advancing the field of optical nano- and microlithography for semiconductor manufacturing and other areas of micro- and nanofabrication. Submissions on alternative exposure techniques and non-IC applications will be considered for joint sessions with other conferences.

Specific topics of this conference include, but not limited to:

Optical Lithography for Semiconductor Manufacturing

- multiple patterning technology for critical layers
- EUV-to-optical matched overlay accuracy
- edge placement error control
- on product overlay improvement
- CD uniformity control
- LER and LWR analysis and improvement
- lithographic correction of errors elsewhere in the processing chain
- mask effect on imaging, including mask-induced focus shifts and aberrations
- negative tone processes and related modeling techniques.

Optical Technology Improvement with Novel Techniques

- novel illumination and mask technology
- novel materials and processes that push the optical limit
- alternative imaging methods: laser direct write, multi-wavelength lithography, negative index and
- plasmonic lenses
- complementary lithography with DSA, e-beam, EUV and nanoimprint
- maskless optical techniques.

OPC, Source Mask Optimization, and Inverse Lithography Technology

- use of AI algorithms for OPC, SMO and ILT: machine learning, deep learning, and neural networks
- use of quantum computing
- curvilinear mask pattern by multi-beam mask writers
- predictive modeling and verification
- 3D modeling of mask, resist and etch
- modeling and remediation of resist and process stochastic effects
- advanced pattern matching for hotspot detection.

Lithography Equipment and Subsystems

- integration of the lithography scanner with other fab tools
- exposure tools and tracks that support multiple patterning processes and DSA
- productivity improvement
- on-product overlay control
- overlay mark design and optimization towards product feature placement
- improved wafer and mask alignment
- tool control for OPC stability and matching
- novel advances in system and lens self-metrology.

Lithography Costs and Environmental Protection

- high-throughput tools and processes
- productivity and cycle time improvement, advanced process control (APC)
- product layout and cost considerations
- environmental protection: saving electric power and natural resources.

Optical lithography for Non-IC Applications

- silicon photonics and communications
- flat panel and display applications
- biological applications: biosensors and 3D skeletons for stimulation of cell growth
- optical micro- and nanostructure fabrication
- data storage applications such as HDD and patterned media
- flexible electronics and organic electronics
- lighting, PV and solar cells nanopatterning
- micro-stereolithography
- holographic applications.

Student Award

Students submitting papers to AL105 (Optical Microlithography) and AL101 (EUV Lithography) will be considered for the Cymer Scientific Leadership Award for Best Student Paper. This award is given each year at this conference and recognizes extraordinary work achieved by students interested in the microlithography field, and strongly supports the contributions made to scientific advancement at the conference. The award includes a plaque along with a monetary award to help student's future research activities.

All candidates for the Cymer award, including those who are placed as an oral presentation, are asked to present their work on a poster during the poster session for the Optical Microlithography conference.

If you are/have a student author or co-author that is making the presentation in the Optical Microlithography conference or EUV lithography, please send your tracking number to Will Conley at:

will_conley@cymer.com

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