2025 EUVL and Source Workshop

June 21-22 (Online Only Short Courses)

June 23 - June 26, 2025 (Held In-Person only at MIT Lincoln Lab)

EUV Litho, Inc.

LINCOLN LABORATORY
MASSACHUSETTS INSTITUTE OF TECHNOLOGY

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DAY 1, Monday, 23 June, 2025: Blue-X Technical Working Group (TWG) Meeting

Start	Title	Presenter
8:30	*Breakfast, Coffee and Check-in*	
Session 1:	**Blue-X Opening Session**	**Session Chair:** Mordy Rothschild, MIT LL
9:30	Announcements, Program and Membership Updates	Vivek Bakshi, EUV Litho
Session 2:	**Resist Sub TWG Presentations**	**Session Chair:** Mordy Rothschild, MIT LL
9:50	Review of LBNL exposure results of June 13	Dario Goldfarb, IBM
10:05	Resist Testing at PSI	Iacopo Mochi, PSI
10:15	Resist Testing at PAL	Sangsul Lee, POSTECH
10:25	Resist Testing at BNL	Nikhil Tiwale, BNL
10:35	*Break*	
Session 3:	**Optics and Mask Sub TWG Updates**	**Session Co-Chairs:** Meng Lee (Veeco) and Marcelo Ackermann, Univ of Twente
10:50	Imaging and Optical Design Sub TWG Update	Gregg Gallatin, Applied Math and Allen Gabor, IBM / EUV Tech
11:10	ML Optics Sub TWG: ML Round Robin Update	Marcelo Ackermann, Univ of Twente
11:30	Non ML Optics Sub TW Update	Mark Schattenburg, MIT
11:40	Mask Sub TWG Update	Meng Lee, Veeco
12:00	*Lunch*	
Session 4:	**Metrology Sub TWG Update**	**Session Co-Chairs:** Isvar Cordova (NIST) and Muharrem Bayraktar, Univ of Twente
1:00	Flying Circus Program Update	Muharrem Bayraktar, Univ of Twente
1:10	Preparing for the future of EUVL metrology at NIST, the U.S. National Metrology Institute	Rob Vest, NIST
1:20	TBA	Stephanie Moffitt
Session 5:	**Source Sub TWGs Update**	**Session Co-Chairs:** Oscar Versolato, ARCNL and James Colgan, LANL
1:30	The Must Light Source	Yosuke Honda, KEK
1:40	xLight FEL Status Update	Kevin Heidrich, xLight
1:50	Advanced Fusion Source Status Update	William Joyce, AFS
2:00	EUV and plasma sources using high energy solid state $\lambda \approx 2$ μm laser drivers	Jackson Williams, LLNL
2:10	Solid state laser drivers for EUV plasma sources	Peter Moulton, MIT LL
2:20	Plasma Simulation for Blue-X Sources	Paul Chesler, MIT LL
2:30	Plasma Simulation for Ne Sources for 6.7 nm emission	Alessandro Ruocco, FS Dynamics
2:40	Liquid Nitrogen Droplets for Blue-X Sources	Tommy Sebastian, MIT LL
2:50	Overview of the fundamental atomic data required for modeling the emission from Blue-X ions of interest	James Colgan, LANL
3:00	Plasma Sources sub TWG Update	Takeshi Higashiguchi, Utsunomiya University
3:15	*Break*	
Session 6:	**Blue-X Closing Session**	**Session Chair:** Vivek Bakshi, EUV Litho
3:30	Potential Stoplight Charts for Blue-X: Presentation and Discussion	Allen Gabor, IBM
4:10	*Break*	
4:30	Joint Reception with 2025 EUVL and Source Workshop Attendees	
6:00	Buses take attendees back to their hotels	

DAY 2, Tuesday, 24 June, 2025: 2025 EUVL and Source Workshop

Start	Title	Presenter
8:30	*Breakfast, Coffee and Check-in*	
Session 1:	**Keynote 1**	**Session Chair:** Mordy Rothschild, MIT LL
9:00	Welcome and Announcements	Vivek Bakshi, EUV Litho and Mordy Rothschild, MIT LL
9:15	Update on High-NA EUV in process technology development	Steven Carson, Intel
9:45	IBM Lithography Roadmap and Need for Future Lithography Tools	Allen Gabor, IBM
10:15	Microelectronics Development at Lincoln Laboratory	Mark Gouker, MIT LL
10:45	*Break*	
Session 2:	**Mask 1**	**Session Co-Chairs:** Marcus Benk, CXRO and Matt Hettermann, EUV Tech
11:00	EUV Absorber Sidewall Metrology with EUV Scatterometry	Peter Dudenas, EUV Tech
11:15	Hyper-NA EUV Imaging, and Beyond	Marcus Benk, CXRO
11:30	HVM-ready EUV zoneplate microscopy for mask defect review	Matt Hetterman, EUV Tech
11:45	*Lunch*	
Session 3:	**Mask 2**	**Session Co-Chairs:** Ron Levi, Corning and Katrina Rook, Veeco
12:45	EXTREME ULE® for EUV Lithography reticles	Roni Levi, Corning
1:00	Ion Implantation for Improved Etching and Optical Performance in Next-Generation EUV Mask	Yunsoo Kim, Hanyang University
1:15	Holistic design for EUV blanks beyond 1.X nm node	Ikebe Yohei, Hoya
1:30	High NA EUV design to mask stitching enablement	Kevin Lucas, Synopsys
1:45	Advanced Ion Source & Target Developments for EUV Mask Multilayer Deposition	Katrina Rook, Veeco
2:00	*Break*	
Session 4:	**Metrology**	**Session Chair:** Ahmed Diallo, PPPL
2:15	High Resolution Imaging and Spectrographic Instruments for 1-10 nm X-ray Astrophysics	Mark Schattenburg, MIT
2:30	Absolute Traceable Electrical Substitution Radiometers for EUV Wavelengths and Beyond	Brian Simonds, NIST
2:45	Synthesis and metrology of Cr/Sc-based multilayer mirrors for the water window	Franck Delmotte, Université Paris-Saclay
Session 5:	**Modeling** *(Session Dedicated to the Memory of Howard Scott)*	**Session Co-Chairs:** Igor Golovkin, Prism Computations and James Colgan, LANL
3:00	In memory of Howard Scott	James Colgan, LANL
3:05	Effective temperature approximations for use in modeling non-LTE tin plasmas	James Colgan, LANL
3:20	Examining Kinetic Plasma Behavior in EUVL Sources with Particle-In-Cell Simulations	Kirill Lezhnin, PPPL
3:35	Plasma Simulations of EUV/x-ray Sources: Radiation Transport and Atomic Physics Models	Igor Golovkin, Prism Computations
3:50	Atomic model to model EUV emission spectrum and to produce the opacity table of tin	Akira Sasaki, QST
4:05	*Break*	
Session 6:	**Sources 1**	**Session Co-Chairs:** Jens Brunne, Trumpf and Hakaru Mizoguchi, Kyushu University
4:20	The path towards 1.5kW EUV with the CO2 drive laser	Jens Brunne, Trumpf
4:35	Increment of EUV radiation and reduction of ion energy of laser-produced Sn EUV-light-source plasmas by controlling initial plasma structure using multiple pre-pulse laser irradiations	Kentaro Tomita, Hokkaido University
4:50	Plasma Dynamics and Future of LPP-EUV Source for Semiconductor Manufacturing IV	Hakaru Mizoguchi, Kyushu University
5:05	Diagnostics of Laser-assisted Discharge Tin Plasma EUV source using collective Thomson scattering	Hideyuki Sera, Ushio
5:20	*Break*	
Session 7:	**Poster Session**	**Session Chair:** Vivek Bakshi, EUV Litho
7:00	Buses depart for hotels	

DAY 3, Wednesday, 25 June, 2025: 2025 EUVL and Source Workshop

Start	Title	Presenter
8:30	*Breakfast, Coffee and Check-in*	
Session 8:	**Keynote 2**	**Session Chair:** Carrie Huguenin, MIT LL
8:55	Welcome and Announcements	Vivek Bakshi, EUV Litho and Mordy Rothschild, MIT LL
9:00	Research & roadmap for future sources of EUV light and beyond (BEUV)	Oscar Versolato, ARCNL
9:30	We Can Make a Difference – How to Promote Women in Technology	Debbie Gustafson, Energetiq
10:00	Development of Next-Generation Semiconductor Process Technologies for EUV and BEUV under Japan's "K Program" for Economic Security by JST	Junji Yumoto, University of Tokyo
10:30	*Break*	
Session 9:	**Resist and Patterning 1**	**Session Co-Chairs:** Alex Robinson, IM and Anuja DeSilva, Lam
10:45	The Multi-Trigger Resist - EUV Performance Update	Alex Robinson, IM
11:00	Recent Developments and an Unexpected Discovery in Our Tin-Based Inorganic Molecular Resists for EUV Lithography	Hyun-Dam Jeong, Chonnam National University
11:15	EUV photoresists with controlled sequences lead to improved stochastics and the discovery of a novel patterning mechanism	Chenyun Yuan, Cornell
11:30	Next-Generation EUV Double Amplification Photoresists From Acid-Catalyzed Chain Unzipping	Rachel Snyder, Dupont
11:45	EUV NTD-CAR performance toward high-NA EUVL	Nishiki Fujimaki, Fujifilm
12:00	Dry Resist Patterning Readiness Towards High NA EUV Lithography	Anuja DeSilva, Lam
12:15	*Lunch*	
Session 10:	**Sources 2**	**Session Co-Chairs:** Jochen Viekers, ILT and Takeshi Higashiguchi, Utsunomiya University
1:15	Efficient EUV/B-EUV sources by laser irradiation schemes	Takeshi Higashiguchi, Utsunomiya University
1:30	A compact laser-driven short-wavelength radiation source	Yusuke Teramoto, Ushio
1:45	SXR development for metrology, inspection, and process control using a discharge-produced plasma source	David Reisman, Erergetiq
2:00	Laser-driven x-ray generation for industrial applications	Jocken Vieker, ILT
2:15	*Break*	
Session 11:	**Sources 3**	**Session Co-Chairs:** Peter Moulton, MIT LL and Henry Kapteyn, K&M Labs
2:30	2µm fiber laser systems for next generation EUV plasma sources	Christian Gaida, Active Fiber Systems GmbH
2:45	Why High-Order Harmonic Generation Is the Optimal Source Solution for EUV Mask Review Systems	Dong Gun Lee, E-Sol
3:00	High-Harmonic Generation driven Extreme-Ultraviolet Scatterometry for Nanostructure Characterization	Peter Kraus, ARCNL
3:15	High repetition rate, high average power XUV sources based on High Harmonic Generation	Bastian Manschwetus, Class 5 Photonics
3:30	Nanoscale Metrologies using Coherent EUV Sources	Henry Kapteyn, K&M Labs
4:00	Break and Buses Depart for Site Tours and Hotels: Energetiq Reception or MIT. Nano Tour	

DAY 4, Thursday, 26 June, 2025: 2025 EUVL and Source Workshop

Start	Title	Presenter
8:30	*Breakfast, Coffee and Check-in*	
Session 12: Keynote 3		**Session Chair:** Mordy Rothschild, MIT LL
8:55	Welcome and Announcements	Vivek Bakshi, EUV Litho and Mordy Rothschild, MIT LL
9:00	EUV multilayer optimization for next-generation EUVL - 13.5nm/11.3nm high-NA and 6.6nm/WW opportunities	Bruce Smith, RIT
9:30	EUV and Non-EUV Based Lithography R&D to Extend Semiconductor Device Scaling and Improve Manufacturing Efficiency	Robert Chau, Natcast
10:00	*Break*	
Session 13: Supplier Showcase		**Session Co-Chairs:** Jacqueline van Veldhoven, TNO and Meng Lee, Veeco
10:15	Cost- Effective EUV Light Sources for High-Volume Manufacturing	Henry Chou, Energetiq
10:30	Studying the interaction of EUV and plasma with scanner construction materials	Jacqueline van Veldhoven, TNO
10:45	Applications of EUV Metrology Tools	Matt Hettermann, EUV Tech
11:00	Tools and solutions for actinic EUV metrology	Andreas Biermanns – Foeth, Research Instruments
11:15	2025 EUV and Source Workshop Invited Talk (Tentative Title)	Meng Lee, Veeco
11:30	*Lunch*	
Session 14: Resist and Patterning 2		**Session Co-Chairs:** Ralph Dammel, Merck and Nikhil Tiwale, BNL
12:45	Estimation of Resist Photospeeds for Blue-X Wavelengths	Ralph Dammel, Merck/EMD Electronics
1:00	Advancing EUV Photoresist Development: High-Throughput Screening of Electron-Induced Chemical Transformations	Oleg Kostko, CXRO
1:15	Isomorphic molecular control of Sb based inorganic EUV photoresist for optimized photosensitivity and stability	Myung-Gil Kim, Sungkyunkwan University
1:30	Organic-Inorganic Hybrid EUV Photoresists Derived from Atomic Layer Deposition Techniques	Chang-Yong Nam, Brookhaven National Lab
1:45	*Break*	
Session 15: Optics *(Session dedicated to the memory of Sascha Migura, Zeiss)*		**Session Co-Chairs:** Torsten Feigl, optiXfab and Marcelo Ackermann, University of Twente
2:00	In Memory of Sascha Migura	Heiko Feldmann, Zeiss
2:05	Beyond One-Size-Fits-All: Tailoring EUV (and BEUV) Optics for HVM Efficiency	Donic Flagello, Nikon Research
2:20	Hyper-NA: an EUV system with a numerical aperture of at least 0.75	Michael Patra, Carl Zeiss
2:35	2025 EUV and Source Workshop Invited Talk (Tentative Title)	Torsten Feigl, optiXfab
2:50	2025 EUV and Source Workshop Invited Talk (Tentative Title)	Marcelo Ackermann, University of Twente
3:05	Advanced Blue-X Multilayer Coating Designs Strategies	Vladimir Liberman, MIT LL
3:20	Break	
Session 16: Resist and Patterning 3		**Session Co-Chairs:** Sascha Brose, RWTH and Iacopo Mochi, PSI
3:35	Lab-based EUV interference lithography for large-area nanopatterning towards sub-10 nm resolution	Sascha Brose, RWTH
3:50	Replacing EUV with X-ZPAL	Hank Smith, MIT
4:05	Advanced Coater/developer Technologies for High-NA EUV Lithography	Congque Dink, TEL
4:20	EUV Lithography at The Center for X-Ray Optics	Bruno LaFontaine, CXRO
4:35	Development of a Next-Generation Interference Lithography End Station at the Swiss Light Source	Iacopo Mochi, PSI
4:50	Amorphous Zeolitic imidazolate Framework (aZIF) Films for Electron Beam, Extreme UV, and Beyond Extreme UV Lithography Applications	Michael Tsapatsis, John Hopkins University
5:05	Announcements	
5:20	Workshop Dinner	
7:00	Buses depart for hotels	