# Photomask Japan 2023 Presentations: Day 1

*As of April 21, 2023*

| Date (JST) | Session Time (JST UTC+9) | PDT UTC-7 | CEST UTC+2 | Session No. | Session Title | Program No. | Presentation Title | Name | Affiliation | Country |
|---|---|---|---|---|---|---|---|---|---|---|
| **April 25, 2023** | **9:00-9:10** | 24-Apr 17:00 I 18:30 | 25-Apr 2:00 I 3:30 | | **Opening** | | | | | |
| | **9:10-10:30** | | | **1** | **Opening Session: Day 1** | 1-1 (Keynote) | Status and challenges of high NA EUV ECO-system | Kurt Ronse | imec | Belgium |
| | | | | | | 1-2 (Invited) | Applications of EUV Metrology Tools | Matt Hettermann | EUV Tech | USA |
| | | | | | | 1-3 | Using X-ray fluorescence as an independent metrology of layer thickness and intermixing in reflective EUV multilayers | Ashish Kulkarni | Veeco Instruments | USA |
| | **10:30-10:50** | | | | Break | | | | | |
| | **10:50-12:30** | 18:50 I 20:30 | 3:50 I 5:30 | **2** | **EUV Inspection & Repair** | 2-1 (Invited) | Actinic patterned mask inspection for EUV Lithography | Toshiyuki Todoroki | Lasertec | Japan |
| | | | | | | 2-2 | Progress Report on Actinic Patterned Mask Inspection for EUVL | Safak Sayan | Intel Corporation | USA |
| | | | | | | 2-3 (Invited) | In-line Scanning Probe Technologies for Mask Defect Inspection and Repair | Sang-Joon Cho | PARK SYSTEMS | Korea |
| | | | | | | 2-4 | AFM clean and nanomachining repair technology for future mask nodes | Tod Robinson | Bruker BNSM RMR | USA |
| | **12:30-13:30** | | | | Lunch Break | | | | | |
| | **13:30-15:00** | 21:30 I 23:00 | 6:30 I 8:00 | **3** | **NIL 1** | 3-1 (Invited) | TELs Patterning Technologies for Next Generation Lithography Using Nanoimprint Lithography | Tomohito Yamaji | Tokyo Electron Ltd. | Japan |
| | | | | | | 3-2 | Development of Nanoimprint Templates for Dual Damascene Processing | Hisayoshi Watanabe | Dai Nippon Printing Co., Ltd. | Japan |
| | | | | | | 3-3 | Nanoimprint Performance Improvements for High Volume Semiconductor Device Manufacturing | Hiromichi Hara | Canon Inc. | Japan |
| | | | | | | 3-4 | Nanoimprint Post Processing Techniques to Address Edge Placement Error | Go Tsuchiya | Canon Inc. | Japan |
| | **15:00-15:20** | | | | Break | | | | | |
| | **15:20-16:50** | 23:20 I 25-Apr 0:50 | 8:20 I 9:50 | **4** | **NIL 2** | 4-1 (Invited) | Nanoimprint_From Sinlge DIE to Wafer Level | Christine Thanner | EV Group | Austria |
| | | | | | | 4-2 | Simulation of Fluorescence Alignment with Atomic-Scale Precision for Ultraviolet Nanoimprint Lithography | Hiromasa Niinomi | Tohoku University | Japan |
| | | | | | | 4-3 | Ultra-High Throughput Electron Beam Lithography for Wafer Size Nanoimprint Mold Fabrication | Takaomi Ito | Elionix Inc. | Japan |
| | | | | | | 4-4 | Nanoimprint and nanoprint processes using Seamless Roller Mold | Makoto Okada | Asahi Kasei Corp. | Japan |
| | **16:50-17:10** | | | | Break | | | | | |
| | **17:10-18:40** | 1:10 I 2:40 | 10:10 I 11:40 | **5** | **EUV Lithography & Source** | 5-1 (Invited) | High NA EUV: Progress update and mask impact | Jan van Schoot | ASML Netherlands B.V. | Netherlands |
| | | | | | | 5-2 | Reducing systematic LCDU of dense contact hole arrays on wafer via source optimization | Joern-Holger Franke | imec | Belgium |
| | | | | | | 5-3 | High-brightness LDP source | Kazuya Aoki | USHIO INC. | Japan |
| | | | | | | 5-4 | Modeling of the emission spectrum from Sn to rare-earth elements for the Extreme Ultra-Violet Lithography | Akira Sasaki | National Institutes for Quantum Science and Technology | Japan |

# Photomask Japan 2023 Presentations: Day 2

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|---|---|---|---|---|---|---|---|---|---|---|
| **April 26, 2023** | **9:00-10:10** | 25-Apr 17:00 ｜ 18:10 | 26-Apr 2:00 ｜ 3:10 | **6** | **Opening Session: Day 2** | 6-1 (Keynote) | Holistic Approaches Toward High NA EUV Lithography | Seiji Nagahara | Tokyo Electron Ltd. | Japan |
| | | | | | | 6-2 | Exploring Photomask Etching Capabilities For New EUV Absorber Materials | Rebecca Stern | Applied Materials | USA |
| | | | | | | 6-3 | Study of EB resist dissolution contrast and chemical blur impact on the ultimate resolution | Kei Yamamoto | FUJIFILM Corporation | Japan |
| | **10:10-10:30** | | | | Break | | | | | |
| | **10:30-11:50** | 18:30 ｜ 19:50 | 3:30 ｜ 4:50 | **7** | **Mask Data Handling** | 7-1 (Invited) | The impact of real curve layout in Mask Data Preparation | Masakazu Hamaji | Nippon Control System Corporation | Japan |
| | | | | | | 7-2 (Invited) | You don't need 1nm contours for curvilinear shapes: Pixel-based computing is the answer | Abhishek Shendre | D2S, Inc. | USA |
| | | | | | | 7-3 | New Multi-Beam Mask Data Preparation Method for EUV High Volume Data | Kyungsup Shin | Samsung Electronics Co., Ltd. | Korea |
| | | | | | | Canceled 7-4 | Application of SONR for a better OPC model for EUV curvilinear photomask | Chih-I Wei | Siemens Digital Industries Software | Belgium |
| | **11:50-13:10** | | | | Lunch Break | | | | | |
| | **13:10-14:50** | 21:10 ｜ 22:50 | 6:10 ｜ 7:50 | **8** | **Poster Session** | 8-1 | Super Smoothing of Nanoscale Quartz Surface Using Amorphous Carbon Films | Abdelrahman Farghali | The University of Tokyo | Japan |
| | | | | | | 8-2 | Evaluation of suprathermal ions in a laser-produced plasma beyond-EUV source | Takeru Niinuma | Utsunomiya University | Japan |
| | | | | | | 8-3 | Property of Amplifier Using Yb:YAG Thin Rod | Shotaro Hirao | Utsunomiya University | Japan |
| | | | | | | 8-4 | Carbon/Boron Multilayer for Beyond EUV Lithography | Umi Fujimoto | University of Hyogo | Japan |
| | | | | | | Canceled 8-5 | The process-footprint and density-dependent errors correction of laser mask pattern generator with software-based data path for CD uniformity improvement | Yen-Hao Chen | Taiwan Mask Corporation | Taiwan |
| | | | | | | 8-6 | Application of Pattern Matching on Single Die Photomask for AIMS Reference Image Searching | Fei Lin Liu | Taiwan Mask Corporation | Taiwan |
| | | | | | | 8-7 | Sidewall angle calculation on CDSEM metrology | WenWei Lee | Taiwan Mask Corporation | Taiwan |
| | | | | | | 8-8 | A Study of Photomask Manufacture Process based on AI Technology | Hiroshi Nakata | Dai Nippon Printing Co., Ltd. | Japan |
| | **14:50-15:10** | | | | Break | | | | | |
| | **15:10-15:30** | 23:10 ｜ 23:30 | 8:10 ｜ 8:30 | | **Sponsor Session** | | Mycronic Technologies Corporation<br>Laser writer for today and future | | | |
| | **15:30-15:50** | | | | Break | | | | | |
| | **15:50-17:10** | 23:50 ｜ 26-Apr 1:10 | 8:50 ｜ 10:10 | **9** | **EUV Technologies** | 9-1 (Invited) | Spatial frequency breakdown of CD variation | Tatiana Kovalevich | imec | Belgium |
| | | | | | | 9-2 (Invited) | ZEISS AIMS EUV High NA for Actinic Mask Review with EXE:5000 Scanner Emulation | Klaus Gwosch | Carl Zeiss SMT GmbH | Germany |
| | | | | | | 9-3 | Imaging performance of low-n absorbers at the optical resolution limits of high NA EUV systems | Andreas Erdmann | Fraunhofer IISB | Germany |

# Photomask Japan 2023 Presentations: Day 3

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|---|---|---|---|---|---|---|---|---|---|---|
| **April 27, 2023** | **9:00-10:30** | 26-Apr 17:00 – 18:30 | 27-Apr 2:00 – 3:30 | **10** | **Opening Session: Day 3** | 10-1 (Invited) | 11th eBeam Initiative Survey Reports EUV Fueling Photomask Industry Growth | Aki Fujimura | D2S, Inc. | USA |
| | | | | | | 10-2 | New Reticle-like Sensors Deliver Fast, Easy Measurements Inside the Process Chamber | Yukinobu Hayashi | CyberOptics Corporation | USA |
| | | | | | | 10-3 | Investigation of Mask Impact on Wafer LCDU in ArF Lithography | Itaru Yoshida | Toppan Photomask Co., Ltd. | Japan |
| | | | | | | 10-4 | MoSi stain defect reduction in photo resist strip process | Ewin Zhuo | Photronics DNP Mask Corporation Xiamen | China |
| | **10:30-11:10** | | | | Break | | | | | |
| | **11:10-12:20** | 19:10 – 20:20 | 4:10 – 5:20 | **11** | **Patterning Technologies** | 11-1 (Invited) | Pixel-based Data Preparation System for Digital Scanner | Yuho Kanaya | NIKON CORPORATION | Japan |
| | | | | | | 11-2 | Throughput Limits for Ultra-Low Voltage Electron Beam Lithography | Tanj Bennett | Avant-Gray LLC | USA |
| | | | | | | 11-3 | Situation of Stereophonic Lithography Using Parabolic Mirrors | Toshiyuki Horiuchi | Tokyo Denki University | Japan |
| | **12:20-13:20** | | | | Lunch Break | | | | | |
| | **13:20-14:50** | 21:20 – 22:50 | 6:20 – 7:50 | | **Panel Discussion** | | Curvilinear Masks – What Should We Do for High Volume Manufacturing | Masakazu Hamaji | Nihon Control System | Japan |
| | | | | | | | | Jin Choi | Samsung | Korea |
| | | | | | | | | Shingo Yoshikawa | Dai Nippon Printing Co., Ltd. | Japan |
| | | | | | | | | Noriaki Nakayamada | NuFlare Technology, Inc. | Japan |
| | | | | | | | | Toshimichi Iwai | Advantest Corporation | Japan |
| | **14:50-15:10** | | | | Break | | | | | |
| | **15:10-16:10** | 23:10 – 27-Apr 0:10 | 8:10 – 9:10 | **12** | **AI Utilization** | 12-1 | Automated Measurement Method with Human-pose Estimation Model for Cross-sectional SEM Images of Semiconductor Devices | Yutaka Okuyama | Hitachi, Ltd. | Japan |
| | | | | | | 12-2 | Approach to AI Defect Classification for Pahotomask Inspection Equipment Using EOI-AI Software Package Developed by HTL | Hideaki Hamada | HTL Co. Japan Ltd. | Japan |
| | | | | | | 12-3 | Applying deep learning methods in flat panel display mask shop operation | Stefan Fu | Mycronic AB | Sweden |
| | **16:10-16:30** | | | | Break | | | | | |
| | **16:30-17:40** | 0:30 – 1:50 | 9:30 – 10:50 | **13** | **Writing Tools** | 13-1 (Invited) | Multi-Beam Mask Writing: A versatile technology from mature to high-end nodes | Annette Schnettelker | IMS Nanofabrication GmbH | Austria |
| | | | | | | 13-2 | Current Performance of Electron Multi-beam Mask Writers and Future Plans toward High-NA EUV Era | Jumpei Yasuda | NuFlare Technology, Inc. | Japan |
| | | | | | | 13-3 | DUV Mask Writer addressable to 90nm nodes with a sustainability profile | Robert Eklund | Mycronic AB | Sweden |
| | **17:40-17:50** | | | | **Closing** | | | | | |