# 21st Fraunhofer IISB Lithography Simulation Workshop

**May 28 – 30, 2026, Behringersmühle, Germany**

Lithography Simulation

## Program

(status as of May 13, 2026)

### Thursday, May 28

*12:00: Welcome and lunch*

- 14:00 – 14:15: **Welcome and introduction**
- 14:15 – 15:05: **Challenges and solutions stretching EUV litho today and tomorrow (keynote)**; Mark van den Kerkhoff (ASML, Netherlands)
- 15:05 – 15:30: **Waveguide42 - The answer to the ultimate question of EUV-lithography, M3D effects, and everything**; Peter Evanschitzky, Thao Van Nguyen, Andreas Erdmann (Fraunhofer IISB, Germany)

*15:30 – 16:00: Coffee break*

- 16:00 – 16:25: **Physics-informed neural operator–based efficient EUV diffraction modeling with domain decomposition**; Vlad Medvedev, Karthik Sreekumar, Andreas Erdmann, Andreas Rosskopf (Fraunhofer IISB, Germany)
- 16:25 – 16:50: **Rachford splitting: how to guarantee convergence for the Born series in solving Maxwell's equations**; Frank van der Ceelen, Wim M.J.M. Coene (TU Delft, Netherlands)

*17:00: Poster session*

- **Hyper NA EUV: Tackling the ultra-shallow focus challenge with engineered resists**; Gerardo Bottiglieri, Lin Han, Luc van Kessel, Joost van Bree, Bernardo Oyarzun Rivera (ASML, Netherlands)
- **Methodology of CAR resist calibration and metrology challenges**; Mariya Medvedyeva, Herman Nicolai (ASML, Netherlands)
- **Coupled lattice Boltzmann-discrete element modeling of deterministic lateral displacement devices**; Alap Mundayoor[1], Samuel Kemmler[2], Christian Schwemmer[1], Andreas Erdmann[1], Harald Köstler[2], John T. Fourkas[3] ([1]Fraunhofer IISB, Germany, [2]Erlangen-Nürnberg, Germany, [3]University of Maryland, USA)
- **Analysis of modes in periodic EUV mask structures using a Bloch–Floquet-based analytical modal approach**; Varun Jadhav, Andreas Erdmann (Fraunhofer IISB, Germany)
- **Boosting light extraction from Si vacancy color centers in SiC**, Mostafa Kotkat, Christian Gobert, Marina Scharin-Mehlmann, Martin Hofmann, Julietta Förthner, Patrick Berwian, Andreas Erdmann, and Christian Schwemmer (Fraunhofer IISB, Germany)
- **Dipole Sources in the Waveguide method**; Nikolay Zunikov, Peter Evanschitzky, Christian Schwemmer, Mostafa Kotkat (Fraunhofer IISB, Germany)
- **Agnostic compensation of periodic errors in interferometric position sensing**; Christian Schwemmer, Martin Jäntsch, Peter Evanschitzky, Nikolay Zunikov, Andreas Rosskopf, Andreas Erdmann (Fraunhofer IISB, Germany)

*18:30: Dinner*

- 20:00 – 20:10: **How lithography modeling and simulation initially evolved at Fraunhofer**; Wolfgang Henke (retired from ASML)
- 20:10 – 21:00: **Polarization, multilayer, and wavelength challenges for next generation EUVL (keynote)**; Bruce Smith (Rochester Institute of Technology, USA)

## Friday, May 29

- 9:00 – 9:25: **Inverse design for lithography test pattern generation**; Francois Weisbuch (Globalfoundries, Germany)
- 9:25 – 9:50: **Setting up an OPC correction process in a research center: key aspects and benefits**; Juline Saugnier, Vincent Pasquier, Gael Riou, Maria Usuga, Ujwol Palanchoke, Jean-Baptiste Henry, Jonathan Pradelles, Elie Sezestre, Jessy Bustos, Warren Kut King Kan, Aurélien Fay, Estelle Guyez (CEA Leti, France)
- 9:50 – 10:15: **Optimization of 3-dimensional diffractive optical elements by exposure correction and simulation**; Rawan Semaan, Qing Tan, Monserrat Alvarez, Jan Klikovits, Olga Ohletz (GenISys GmbH, Germany)

*10:15 – 10:45: Coffee break*

- 10:45 – 11:10: **Exploring frequency doubling for EUVL: solutions and limitations**; Hazem Mesilhy[1], Doyun Kim[1], Wei Chien[2], Chih-I Wei[2], Thuc Dam[2], Ryan Ryoung Han Kim[1] ([1]imec, Belgium, [2]Synopsys, Taiwan)
- 11:10 – 11:35: **Analysis of mask-3D-induced imaging degradation mechanisms in high- and hyper-NA EUV lithography**; Markus Schröfl, Jan Werschnik (Photonics Precision Engineering, Germany)
- 11:35 – 12:00: **Exploring the optimal orientation for high NA DRAM patterning using aerial image and in-resist simulations**; Hamideh Hassani, Andreas Frommhold, Joern-Holger Franke, Vicky Philipsen (imec, Belgium)

*12:00: Lunch*

- 13:30 – 13:55: **X-photon lithography: advancing 3D nanoprinting**; Mangirdas Malinauskas (Vilnius University, Lithuania)
- 13:55 – 14:20: **The kinetics of 2-step photoinitiation**; John Fourkas (University of Maryland, USA)
- 14:20 – 14:45: **QCM-based simulation of photoresist dissolution kinetics**, Yuqing Jin, Takahiro Kozawa (Osaka University, Japan)
- 14:45 – 15:10: **Metal-oxide resist height variations through pitch in EUV lithography**; Christoph Hauenstein[1], Bernardo Oyarzun Rivera[1], Ruben Maas[1], Gijsbert Rispens[1], Achintya Kundu[2], Tibor Kuna[2], Alain Moussa[2], Mihir Gupta[2], Sonia Castellanos Ortega[3], Peter De Schepper[3] ([1]ASML, Netherlands, [2]imec, Belgium, [3]Inpria)

*15:30: Special event and dinner*

## Saturday, May 30

- 9:00 – 9:25: **Computational and experimental investigations of two-photon polymerization in the strong-pulse regime**; Meng Zhang[1], Isaac Obembe[1], Kh M Asif Raihan[1], Mingman Sun[2], Xiaoming Yu[3], Stephen Kuebler[3] ([1]Kansas State University, USA, [2]University of Wisconsin-Platteville, USA, [3]University of Central Florida, USA)
- 9:25 – 9:50: **Differentiable beam shaping for materials processing with ultrashort laser pulses**; Markus Döring, Alexander Romboy, Nicolai Schneider, Kristian Cvecek, Michael Schmidt (FAU Erlangen-Nürnberg, Germany)
- 9:50 – 10:15: **Generalized compact model for two-photon lithography**; Yuan Yu, Valeriia Sedova, Andreas Erdmann (Fraunhofer IISB, Germany)

*10:15 – 10:45: Coffee break*

- 10:45 – 11:10: **Modeling and optimization of DMD-based maskless lithography**; Felipe Benavides[1], Andreas Erdmann[1], Matthias Nagel[2], Sebastian Degel[2] ([1]Fraunhofer IISB, Germany, [2]Limata GmbH, Germany)
- 11:10 – 11:35: **Modeling of ultra-shallow EUV gratings fabricated via ion irradiation**; Johannes Kaufmann, Thomas Siefke, Uwe Zeitner (FSU Jena, Germany)
- 11:35 – 12:00: **Determination of the optical constants of 2D graphene and hexagonal boron nitride by variable angle VUV-ellipsometry and advanced fitting**; Mattia Mulazzi, Mindaugas Lukosius, Norbert Esser, Alexander Gottwald, Victor Soltwisch (PTB, Germany)
- 12:00 – 12:10: **Concluding remarks**

*12:30: Lunch*