

2021 Source Workshop



Workshop Proceedings



2021 Source Workshop (October 25th -28th) Held Online

2021 Source Workshop

Sponsors



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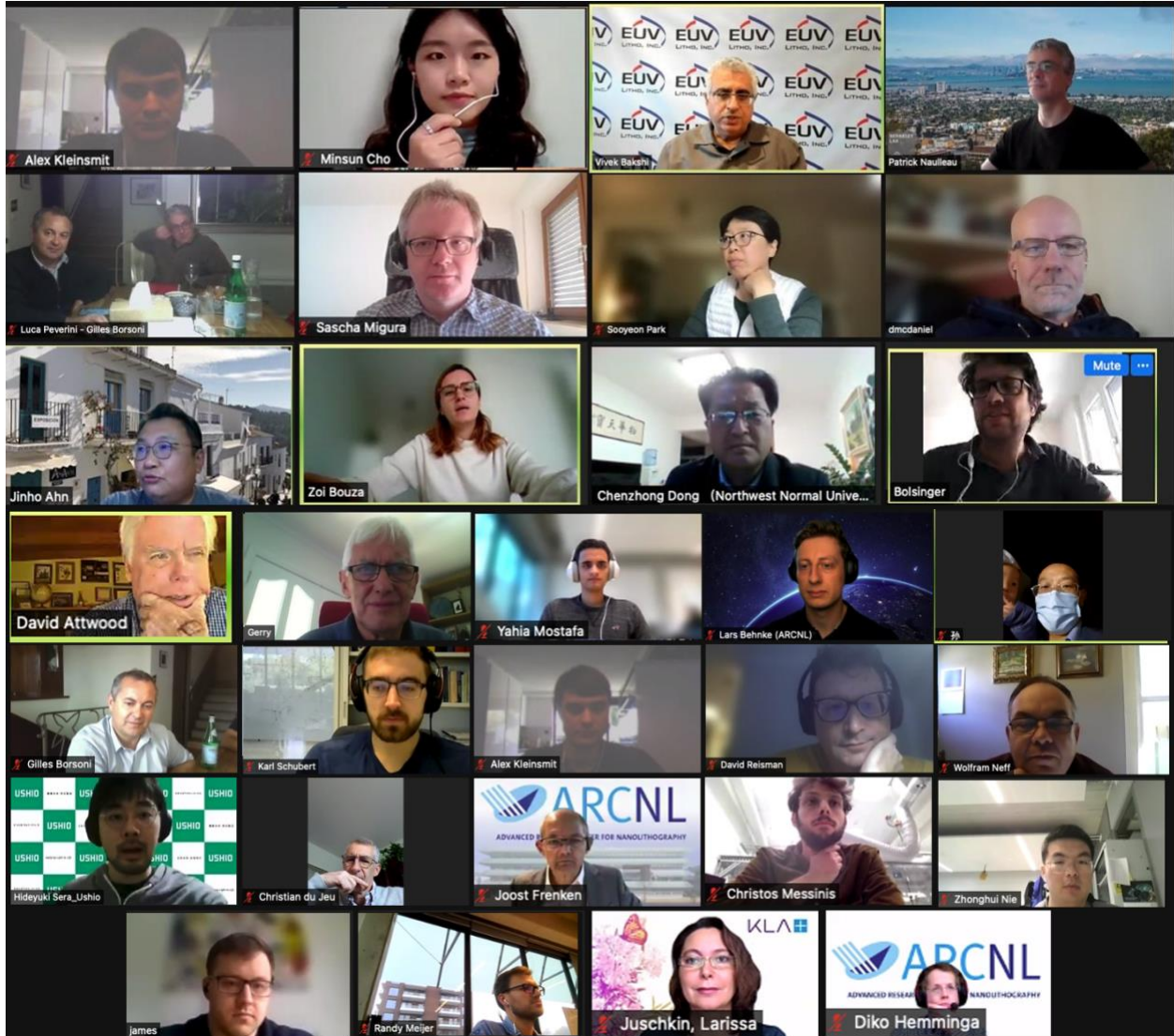
Vivek Bakshi (EUV Litho, Inc.), Chair

Oscar Versolato (ARCNL), Co-Chair

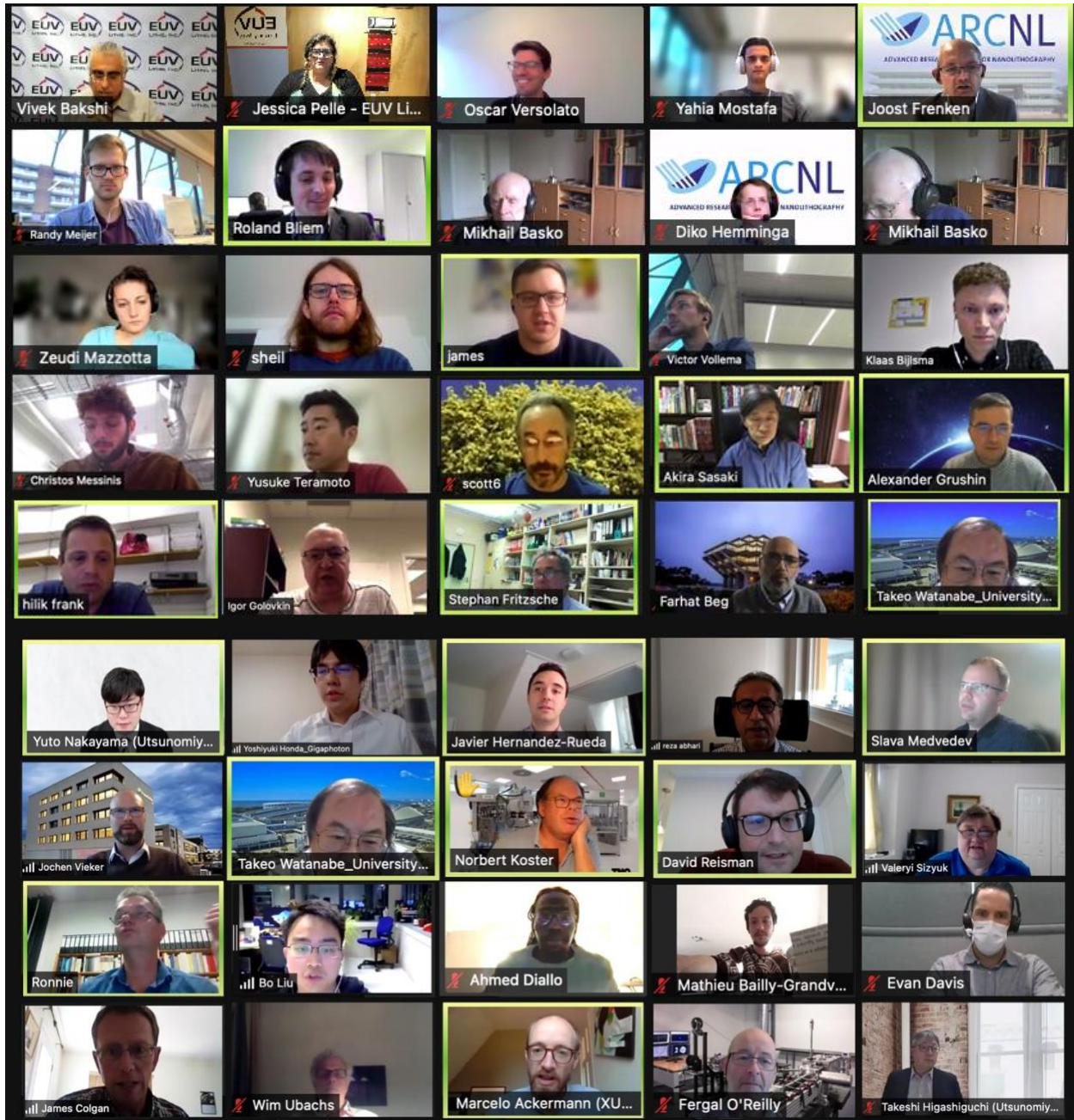
Joost Frenken (ARCNL), Co-Chair

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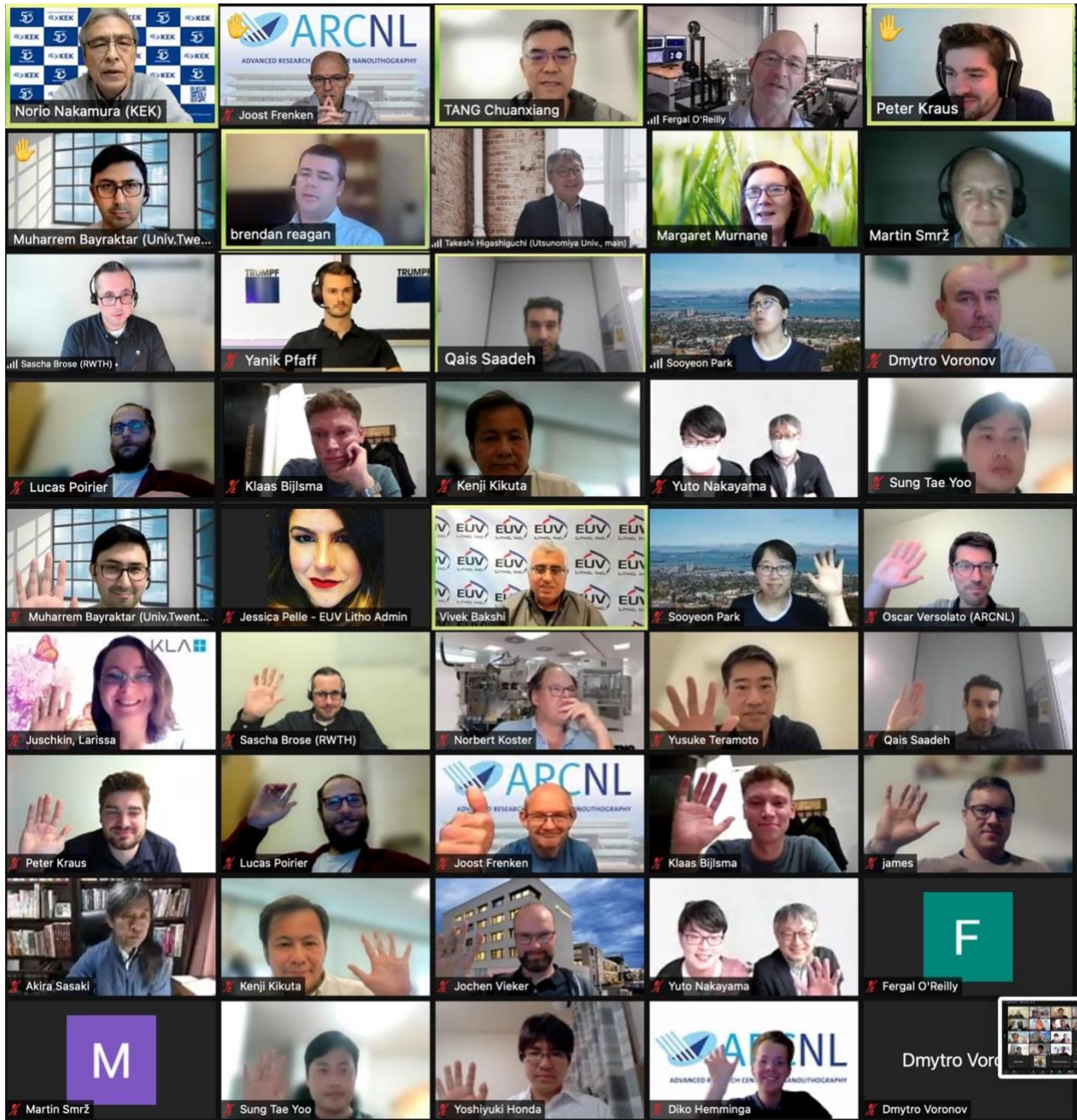
Photos from 2021 Source Workshop!



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WORKSHOP PROCEEDINGS

**2021 Source Workshop
October 25 - October 28, 2021
Held Online**

Day One: Monday, October 25th, 2021

7:00 AM – 7:05 AM Introduction & Announcements

**7:05 AM Session One: ARCNL Program Showcase
Co-Chairs: Joost Frenken (ARCNL) and Oscar Versolato
(ARCNL)**

[Introduction to ARCNL \(S81\) \(Video\)](#)

Joost Frenken

Advanced Research Center for Nanolithography (ARCNL)

**[Materials Research at ARCNL: The Many Interfaces of EUV
Lithography \(S82\) \(Video\)](#)**

Roland Bliem

Advanced Research Center for Nanolithography (ARCNL)

[ARCNL's Metrology Department: An Overview \(S83\) \(Video\)](#)

Stefan Witte

Advanced Research Center for Nanolithography (ARCNL)

[Introduction to ARCNL's Source Department \(S84\) \(Video\)](#)

Oscar Versolato

Advanced Research Center for Nanolithography (ARCNL)

8:05 AM Break (20 minutes)

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Laser-driven Tin Plasma Expansion with Relevance to Extreme Ultraviolet Nanolithography (S85) (Video)

Diko Hemminga^{1,2}, Lucas Poirier^{1,2}, Mikhail Basko³, Ronnie Hoekstra^{1,4}, Wim Ubachs^{1,2}, Oscar Versolato^{1,2}, John Sheil^{1,2}

¹ Advanced Research Center for Nanolithography (ARCNL)

² Department of Physics and Astronomy, and LaserLaB, Vrije Universiteit, De Boelelaan 1081, 1081 HV Amsterdam, the Netherlands

³ Keldysh Institute of Applied Mathematics, Miusskaya Square 4, 125047 Moscow, Russia

⁴ Zernike Institute for Advanced Materials, University of Groningen, Nijenborgh 4, 9747 AG Groningen, the Netherlands

Fully-calibrated Sn LPP EUV Source Spectrum from 5.5 nm – 265 nm (S86) (Video)

James Byers

University of Twente, Netherlands

Towards Energy Efficient Production of 13.5nm Light using 2µm Solid State Lasers (S88) (Video)

Yahia Mostafa

Advanced Research Center for Nanolithography (ARCNL)

TI-REX: a 5->20ns Temporally Shapable and 1.4->4.4µm Wavelength-tunable Source for Nanolithography (S87) (Video)

Zeudi Mazzotta, Jan Mathijssen, Oscar Versolato, Kjeld Eikema, Stefan Witte
Advanced Research Center for Nanolithography (ARCNL)

Laser-vaporization of Tin Sheet Targets (S89) (Video)

Randy Meijer

Advanced Research Center for Nanolithography (ARCNL)

Fundamental Atomic-interaction Measurements: Single Electron Capture Cross Sections for Sn³⁺ on H₂ in the Energy Range 9-51 keV (S90) (Video)

K Bijlsma^{1,2}, S Rai^{1,2}, M Salverda¹, P Wolff¹, I Rabadán³, L Mendéz³, O Versolato^{2,4}, R Hoekstra^{1,2}

¹ Zernike Institute for Advanced Materials, University of Groningen, Nijenborgh 4, 9747 AG, Groningen, The Netherlands

² Advanced Research Center for Nanolithography (ARCNL)

³ Departamento de Química, Universidad Autónoma de Madrid, Cantoblanco, 28049, Madrid, Spain

⁴ Department of Physics and Astronomy, and LaserLaB, Vrije Universiteit, De Boelelaan 1081, 1081 HV, Amsterdam, The Netherlands

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9:55 AM Break (20 minutes)

[An Intense Soft X-ray Source driven by a Mid-IR OPCPA for Ultrafast Metrology in the Water-window \(S91\) \(Video\)](#)

Zhonghui Nie

Advanced Research Center for Nanolithography (ARCNL)

[Tailoring Spatial Entropy in Extreme Ultraviolet Focused Beams for Multispectral Ptychography \(S92\) \(Video\)](#)

Xiaomeng Liu, Lars Loetgering, Anne de Beurs, Mengqi Du, Patrick Konold, Kjeld Eikema, Stefan Witte

Advanced Research Center for Nanolithography (ARCNL)

Department of Physics and Astronomy, and Laserlab, Vrije Universiteit, De Boelelaan 1081 HV Amsterdam, The Netherlands

[Lens Aberration Calibration and Correction in Digital Holographic Microscopy \(S93\) \(Video\)](#)

Christos Messinis

Advanced Research Center for Nanolithography (ARCNL)

[Suppression of Hydrogen Blistering in Mo/Si Layered Structures \(S94\) \(Video\)](#)

Victor Vollema

Advanced Research Center for Nanolithography (ARCNL)

Day Two: Tuesday, October 26th, 2021

7:00 AM – 7:05 AM Welcome & Announcements

7:05 AM Session Two: Code Comparison ([Video Recording Pt. One](#)) ([Video Recording Pt. Two](#))

Session Co-Chairs: John Sheil (ARCNL) and Howard Scott (LLNL)

[Code Comparison 2021 – Problem Description \(S11\) \(Video\)](#)

John Sheil, Howard Scott

Advanced Research Center for Nanolithography (ARCNL)

LLNL

[Code Comparison 2021 – Simulation Results \(S16\) \(Video\)](#)

Katsunobo Nishihara

Osaka University

[Code Comparison 2021 – Simulation Results \(S18\) \(Video\)](#)

Akira Sasaki

QST

[Code Comparison 2021 – Simulation Results \(S12\) \(Video\)](#)

Mikhail Basko

KIAM

[Code Comparison 2021 – Simulation Results \(S13\) \(Video\)](#)

Grushin A.S., Vichev I.Yu., Solomyannaya A.D., Kim D.A

KIAM

[Code Comparison 2021 – Simulation Results \(S14\) \(Video\)](#)

Howard Scott

LLNL

[Code Comparison 2021 – Simulation Results \(S15\) \(Video\)](#)

Hilik Frank

LLNL

8:25 AM Break (15 minutes)

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[Code Comparison 2021 – Simulation Results \(S17\) \(Video\)](#)

Igor Golovkin

Prizm Computations

[Code Comparison 2021 – Simulation Results \(S21\) \(Video\)](#)

John Sheil

Advanced Research Center for Nanolithography (ARCNL)

[A Community Platform for just Atomic Computations \(S20\) \(Video\)](#)

Stephan Fritzsche

Helmholtz Institut

9:25 AM Break (15 minutes)

[Summary 1 \(S22\) \(Video\)](#)

John Sheil

Advanced Research Center for Nanolithography (ARCNL)

[Summary 2 \(S23\) \(Video\)](#)

Howard Scott

LLNL

10:40 AM Discussion (45 minutes)

Day Three: Wednesday, October 27th, 2021

7:00 AM – 7:05 AM Introduction & Announcements

7:05 AM Session 3A - 6: Keynote, Speed Presentations, Metrology, and HVM Sources ([Video Recording Pt. One](#)) ([Video Recording Pt. Two](#))

Session 3A Keynote Co-Chair: Oscar Versolato (ARCNL)

[Update of >300W High Power LPP-EUV Source Challenge for Semiconductor HVM \(Keynote\) \(S2\) \(Video\)](#)

Hakaru Mizoguchi, Hiroaki Nakarai, Tamotsu Abe, Hiroshi Tanaka, Yukio Watanabe, Tsukasa Hori, Yutaka Shiraishi, Tatsuya Yanagida, Georg Soumagne, Tsuyoshi Yamada and Takashi Saitou
Gigaphoton Inc. Hiratsuka facility: 3-25-1 Shinomiya Hiratsuka Kanagawa, 254-8567, JAPAN

[Fundamental Studies of EUV Lithography Including Shorter Wavelength at NewSUBARU Synchrotron Light Facility \(Keynote\) \(S3\) \(Video\)](#)

Takeo Watanabe
Center for EUVL, Laboratory of Advanced Science and Technology for Industry, University of Hyogo, 3-1-2, Kouto, Kamigori, Ako-gun, Hyogo 678-1205, Japan

8:05 AM Break (15 minutes)

Session 4 Speed Presentations Co-Chair: Vivek Bakshi (EUV Litho, Inc.)

[Charge-separated Ion Spectra in Laser-produced Sn Plasma \(S48\) \(Video\) \(Best Poster Award, 2nd Place Tie\)](#)

Yuto Nakayama,¹ Takeru Niinuma,¹ Masaki Kume,¹ Hiromu Kawasaki,¹ Atsushi Sunahara,² and Takeshi Higashiguchi¹
¹*Department of Electrical and Electronic Engineering, Faculty of Engineering, Utsunomiya University, 7-1-2, Yoto, Utsunomiya, Tochigi 321-8585, Japan*
²*Center for Materials Under Extreme Environment (CMUXE), School of Nuclear Engineering, Purdue University, West Lafayette, Indiana 47907, USA*

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[Development Progress of the Key Component Technology for the High Power LPP-EUV Light Source \(S50\) \(Video\)](#)

Yoshiyuki Honda, Shinji Nagai, Yoshifumi Ueno, Fumio Iwamoto, Kenichi Miyao, Hideyuki Hayashi, Yukio Watanabe, Tamotsu Abe, Hiroaki Nakarai and Hakaru Mizoguchi

Gigaphoton Inc. Hiratsuka Facility: 3-25-1 Shinomiya Hiratsuka Kanagawa, 254- 8555, JAPAN

[Fabrication of EUV Light Source with Cold-Cathode Electron Beam \(C-beam\) \(S75\) \(Video\) \(Best Poster Award, 2nd Place Tie\)](#)

Sung Tae Yoo, and Kyu Chang Park

Department of Information Display, Kyung Hee University, Dongdaemun-gu, Seoul, 02447, Korea

[Tailoring the Expansion-to-Propulsion Ratio of Laser-induced Tin Targets for Extreme-ultraviolet Nanolithography \(S76\) \(Video\) \(Best Poster Award, 1st Place\)](#)

Javier Hernandez-Rueda,¹ Bo Liu,^{1, 2} Diko J. Hemminga,^{1, 2} Yahia Mostafa,^{1,2} Randy A. Meijer,^{1, 2} John Sheil,¹ and Oscar O. Versolato^{1, 2}

¹ Advanced Research Center for Nanolithography (ARCNL)

²LaserLab, Department of Physics and Astronomy, Vrije Universiteit Amsterdam, De Boelelaan 1105, 1081 HV Amsterdam, The Netherlands

[Compact Rotating Sn Disc Target LPP Source \(S73\) \(Video\)](#)

Yusuke Teramoto¹, Bárbara Santos¹, Guido Mertens¹, Margarete Kops¹, Ralf Kops¹, Wilko van Nunspeet¹, Marcel Schneider¹, Klaus Bergmann², Yoshihiko Sato³

¹Ushio Germany GmbH, Steinbachstrasse 15, 52074 Aachen, Germany

²Fraunhofer ILT, Steinbachstrasse 15, 52074 Aachen, Germany

³Ushio Inc., 1-6-5 Marunouchi, Chiyoda-ku, Tokyo 100-8150, Japan

[Development of an Experimental Setup to Measure Energy Transfer from Sn ions to H₂ Molecules at Collision Energies Below 10 keV \(S49\) \(Video\)](#)

K Bijlsma^{1,2}, S Rai^{1,2}, M Salverda¹, L Assink¹, O Versolato^{2,3}, R Hoekstra^{1,2}

¹ Zernike Institute for Advanced Materials, University of Groningen, Nijenborgh 4, 9747 AG, Groningen, The Netherlands

² Advanced Research Center for Nanolithography (ARCNL)

³ Department of Physics and Astronomy, and LaserLaB, Vrije Universiteit, De Boelelaan 1081, 1081 HV, Amsterdam, The Netherlands

8:50 AM Break (10 minutes)

Session 5 Metrology Sources Co-Chairs: Reza Abhari (ETHZ) and Yusuke Teramoto (Ushio)

[Update on LPP Source Development at ETH Zurich \(Invited\) \(S63\) \(Video\)](#)

Reza Abhari
ETH Zurich

[High-brightness EUV LPP Source based on Fast-rotating Target \(Invited\) \(S61\) \(Video\)](#)

M. Krivokorytov^{1,2}, V. Gubarev^{1,2}, V. Ivanov^{1,2}, V. Krivtsun^{1,2}, A. Vinokhodov², V. Medvedev^{1,2}, E. Gorsky⁴, A. Kiselev⁴, D. Glushkov³, S. Ellwi³, A. Lash¹, K. Koshelev^{1,2}

¹ EUV Labs, Troitsk, Moscow, Russia

² Institute of Spectroscopy of the Russian Academy of Science (ISAN), Moscow, Troitsk, Russia

³ ISTEQ, Eindhoven, The Netherlands

⁴ TRDC, Troitsk, Moscow, Russia

[Irradiation Systems for Accelerated Testing of EUVL Components \(Invited\) \(S64\) \(Video\)](#)

Jochen Vieker and Klaus Bergmann
Fraunhofer Institute for Laser Technology – ILT Steinbachstr. 15, 52074 Aachen, Germany

[High-brightness LDP Source: Variation of EUV-emitting Plasma \(Invited\) \(S65\) \(Video\)](#)

Yusuke Teramoto¹, Bárbara Santos¹, Guido Mertens¹, Margarete Kops¹, Ralf Kops¹, Wilko van Nunspeet¹, Marcel Schneider¹, Klaus Bergmann², Yoshihiko Sato³

¹Ushio Germany GmbH, Steinbachstrasse 15, 52074 Aachen, Germany

²Fraunhofer ILT, Steinbachstrasse 15, 52074 Aachen, Germany

³Ushio Inc., 1-6-5 Marunouchi, Chiyoda-ku, Tokyo 100-8150, Japan

[Modeling a Discharge Produced Plasma \(DPP\) EUV Source \(Invited\) \(S62\) \(Video\)](#)

David Reisman
Energetiq Technology, Inc., Wilmington, MA 01887, USA

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[Numerical Model of Hybrid Laser-heated Discharge Plasma Devices for EUV Metrology \(Invited\) \(S26\) \(Video\)](#)

V. Sizyuk¹, F. Melsheimer^{2,3}, L. Juschkin², K. Tsigutkin², T. Sizyuk⁴, A. Hassanein¹

¹ *Purdue University, West Lafayette, IN 47907, USA*

² *KLA Corporation, Milpitas, CA 95035, USA*

³ *RWTH Aachen University, Aachen, 52056, GER*

⁴ *Argonne National Lab, Lemont, IL 60439, USA*

10:30 AM Break (15 minutes)

Session 6 HVM EUV Sources Co-Chairs: Farhat Beg (UC San Diego) and Ahmed Diallo (PPNL)

[Characterization of the Laser-Tin Droplet Interactions: Progress and Plans \(Invited\) \(S43\) \(Video\)](#)

Ahmed Diallo

Princeton Plasma Physics Laboratory

[Dynamics of Mass Distribution of Liquid Tin Target \(S41\) \(Video\)](#)

B. Liu,^{1, 2} R. A. Meijer,^{1, 2} J. Hernandez-Rueda,¹ D. Kurilovich,³ H. Gelderblom,⁴ and O. O. Versolato^{1, 2}

1. *Advanced Research Center for Nanolithography (ARCNL)*

2. *LaserLab, Vrije Universiteit Amsterdam*

3. *ASML, Veldhoven*

4. *Eindhoven University of Technology, Eindhoven*

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Update from ARCNL's EUV Source Department on Spectroscopy, Generation of Energetic Tin ions and their Interactions with H₂ and Generating Plasma with Laser Light of 2 μ m Wavelength. (Invited) (S71) (Video)

Ronnie Hoekstra^{1,2}, Luc Assink², Muharram Bayraktar³, Lars Behnke¹, Klaas Bijlsma^{1,2}, Zoi Bouza¹, James Byers³, Diko Hemminga^{1,4}, Adam Lasisse¹, Zeudi Mazzotta¹, Yahia Mostafa¹, Lucas Poirier¹, Subam Rai^{1,2}, Mart Salverda², Joris Scheers^{1,4}, Ruben Schupp^{1,4}, John Sheil¹, Pieter Wolff², Wim Ubachs^{1,4}, Oscar Versolato^{1,4}

¹ - Advanced Research Center for Nanolithography (ARCNL)

² - Zernike Institute for Advanced Materials, University of Groningen, Groningen, the Netherlands

³ - Industrial Focus Group XUV Optics, MESA+, University of Twente, Enschede, the Netherlands

⁴ - Department of Physics and Astronomy and LaserLaB, Vrije Universiteit, Amsterdam, the Netherlands

Non-LTE Modeling of Sn Plasmas (Invited) (S72) (Video)

J. Colgan¹, A. J. Neukirch¹, J. Sheil² and O. O. Versolato²

¹Los Alamos National Laboratory, Los Alamos, NM 87545, USA

²Advanced Research Center for Nanolithography (ARCNL)

EUV Sources for High-volume Manufacturing (HVM): Performance and Availability in the Field, and Innovation Towards the Future (Invited) (S42) (Video)

Evan Davis, Igor Fomenkov, Michael Purvis, Alex Schafgans, Jayson Stewart, Peter Mayer, Klaus Hummler, Alex Ershov, Sam Crisafulli, Andrew LaForge, Yezheng Tao, Slava Rokitski, Chirag Rajyaguru, Georgiy Vaschenko, Payam Tayebati, Daniel Brown, David Brandt
ASML, 17075 Thornmint Ct, San Diego, CA 92127

Effect of Laser Pulse Shapes on 13.5 nm Radiation Generation* (Invited) (S45) (Video)

Farhat Beg, Brian Lee, Kazuki Matsuo and Mathieu Bailly-Grandvaux
Center for Energy Research, University of California San Diego

Day Four: Thursday, October 28th, 2021

7:00 AM – 7:05 AM Introduction & Announcements

7:05 AM Session 3B - 9: Keynote, Blue-X, Lasers, Optics and Metrology ([Video Recording Pt. One](#)) ([Video Recording Pt. Two](#))

Session 3B & 7 Co-Chairs: Takeshi Higashiguchi (Utsunomia) and Fergal O'Reilly (UCD)

[EUV Multilayers Mirrors – Wider, Thinner and Deeper \(Keynote\) \(S1\) \(Video\)](#)

Marcelo Ackermann

University of Twente - Drienerlolaan 5, 7522 NB Enschede, Netherlands

[Blue – X \(EUVL Extension\): Background, Status and Path Forward \(S31\) \(Video\)](#)

Vivek Bakshi

EUV Litho, Inc.

[Laser-produced Plasma EUV Sources for 13.5 nm and Beyond \(Invited\) \(S36\) \(Video\)](#)

Takeshi Higashiguchi¹

¹Department of Electrical and Electronic Engineering, Faculty of Engineering, Utsunomiya University, 7-1-2 Yoto, Utsunomiya, Tochigi 321-8585, Japan

[cERL IR-FEL as PoC of EUV and Blue-X FELs for Future Lithography \(Invited\) \(S32\) \(Video\)](#)

Norio Nakamura, Ryukou Kato, Hiroshi Sakai, Kimichika Tsuchiya, Yasunori Tanimoto, Yosuke Honda, Tsukasa Miyajima, Miho Shimada, Takashi Obina, Hiroshi Kawata

High Energy Accelerator Research Organization (KEK)

[Development of SSMB EUV Light Source at Tsinghua University \(Invited\) \(S34\) \(Video\)](#)

Chuanxiang Tang

On behalf of the Tsinghua SSMB group

Tsinghua University, Beijing 100084, China

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[Laser Development for SSMB EUV Light Source at THU \(S37\) \(Video\)](#)

Lixin Yan, Xing Liu, Huan Wang, Xinyi Lu, Xiujie Deng, Alexander Chao,
Wenhui Huang, Chuanxiang Tang
Laboratory of Accelerator, Tsinghua University, Beijing, China

8:50 AM Break (15 minutes)

[Laser Plasma Characterization Techniques and Results from UCD \(Invited\) \(S35\) \(Video\)](#)

Fergal O'Reilly, Padraig Dunne, Mateusz Olszewski
School of Physics, University College Dublin

[Solid State Tm:YLF Lasers for Driving EUV Sources \(Invited\) \(S33\) \(Video\)](#)

Brendan A. Reagan, Justin Galbraith Thomas Galvin, Glenn Huete, Hansel Neurath, Craig Siders, Emily Sistrunk, Thomas Spinka, and Issa Tamer
Lawrence Livermore National Laboratory

9:35 AM Session 8 Co-Chairs: Peter Kraus (ARCNL) and Martin Smrz (HiLASE)

[Attosecond Quantum Technologies for Extracting the Structural, Mechanical, and Transport Properties of Nanostructured Materials \(Keynote\) \(S4\) \(Video\)](#)

Margaret M. Murnane
JILA and STROBE, University of Colorado Boulder, Boulder, CO 80309-0440

[New Approaches for Coherent Extreme-ultraviolet Generation and Manipulation from Solids \(Invited\) \(S51\) \(Video\)](#)

Peter Kraus

- 1) *Advanced Research Center for Nanolithography (ARCNL)*
- 2) *Department of Physics and Astronomy, and LaserLaB, Vrije Universiteit, De Boelelaan 1081, 1081 HV Amsterdam, The Netherlands*

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[Compact EUV Spectrometry Tool for Thin Film and Nanograting Characterization \(Invited\) \(S52\) \(Video\)](#)

Sascha Brose^{1,2}, Sophia Schröder^{1,2}, Lukas Bahrenberg^{1,2}, Henning Heiming^{1,2}, Serhiy Danylyuk³, Jochen Stollenwerk^{1,2,3}, and Carlo Holly^{1,2}

¹RWTH Aachen University TOS - Chair for Technology of Optical Systems, Steinbachstr. 15, 52074 Aachen, Germany;

²JARA - Fundamentals of Future Information Technology, Research Centre Jülich, 52425 Jülich, Germany;

³Fraunhofer ILT - Institute for Laser Technology, Steinbachstr. 15, 52074 Aachen, Germany

[Herriott Cell Based Nonlinear Compression \(Invited\) \(S53\) \(Video\)](#)

Yanik Pfaff^{1,2}, Clara Saraceno², Thomas Metzger¹

¹TRUMPF Scientific Lasers GmbH & Co. KG, Feringastr. 10a, 85774 Unterföhring, Germany

²Photonics and Ultrafast Laser Science, Ruhr University Bochum, Universitätsstr. 150, 44801 Bochum, Germany

[kW-class Picosecond Thin-disk Lasers with Diffraction-limited Beams at HiLASE Facility \(Invited\) \(S54\) \(Video\)](#)

M. Smrž, J. Mužík, M. Chyla, J. Huynh, P. Sikocinski, J. Cvrček, O. Novák, H. Turčičová, M. Cimrman, D. Štěpánková, M. Duda, and T. Mocek

HiLASE Centre, Institute of Physics CAS, Za Radnicí 828, 252 41 Dolní Břežany, Czechia

11:05 AM Break (15 minutes)

Session 9 Co-Chairs: Norbert Koster (TNO) and Muharrem Bayraktar (Univ. Twente)

[Broadband Metrology of EUV Light Sources \(Invited\) \(S66\) \(Video\)](#)

Muharrem Bayraktar

Industrial Focus Group XUV Optics, University of Twente, Enschede, The Netherlands

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[Hybrid Metrology Assisted Determination of Optical Constants in the EUV Spectral Range \(Invited\) \(S67\) \(Video\)](#)

Qais Saadeh,¹ Philipp Naujok,² Vicky Philipsen,³ Philipp Hönicke,¹ Christian Laubis,¹ Christian Buchholz,¹ Anna Andrie,¹ Christian Stadelhoff,¹ Heiko Mentzel,¹ Anja Schönstedt,¹ Victor Soltwisch,¹ and Frank Scholze¹

¹Physikalisch-Technische Bundesanstalt (PTB), Abbestraße 2-12, 10587 Berlin, Germany

²OptiX fab GmbH, Hans-Knöll-Str. 6, 07745 Jena, Germany

³IMEC, Kapeldreef 75, B-3001 Leuven, Belgium

[EBL2 Upgrades and Upcoming Extensions \(Invited\) \(S68\) \(Video\)](#)

Norbert Koster

TNO, Stieltjesweg 1, 2628 CK Delft, The Netherlands

[Highly Efficient Ultra-Low Blaze Angle Multilayer Grating as a Spectral Purity Filter for EUV Lithography \(S74\) \(Video\)](#)

Sooyeon Park, Dmitriy L. Voronov, Eric M. Gullikson, Fahard Salmassi and, Howard A. Padmore

Lawrence Berkeley National Laboratory, 1 Cyclotron Road, Berkeley, CA 94720, USA

Announcements

Vivek Bakshi

EUV Litho, Inc.

Workshop Adjourned

