2018 Source Workshop

November 5-7, 2018

Prague ▪ Czech Republic

Workshop Agenda

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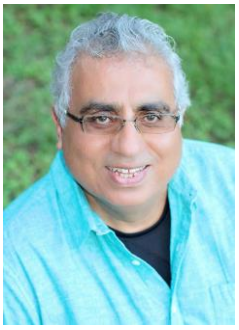
Vivek Bakshi (EUV Litho, Inc.), Chair
Akira Endo (HiLASE), Co-Chair
Ladislav Pina (CTU and Rigaku), Co-Chair
Tomas Mocek (HiLASE), Co-chair

Welcome



Dear Colleagues;

We have an excellent agenda this year for the 2018 Source Workshop and I am looking forward to welcoming you to Prague, Czech Republic.

Source workshop, now in its 9th year, is the largest annual gathering of EUV and XUV source experts! This year we are including the new topic of Blue- X (EUVL extension via short wavelength sources and optics). The workshop proceedings will be published online and made available to all.

This year, the EUV Source Workshop is organized by HiLASE and EUV Litho, Inc. and the workshop has been made possible by the financial support of workshop sponsors: Greateyes, Gigaphoton, ETHZ and Energetiq. I will also like to thank Source workshop's technical working group (TWG), workshop support staff, session chairs and presenters for their part in making the workshop a success. I look forward to your participation in the workshop.

Best Regards

Vivek Bakshi
Chair, 2018 Source Workshop

Source Technical Working Group (TWG)

Reza Abhari (ETH Zurich)
Peter Anastasi (Silson)
Sasa Bajt (DESY)
Klaus Bergmann (ILT-Fraunhofer)
Udo Dinger (Carl Zeiss)
Padraig Dunne (UCD)
Samir Ellwi (ISTEQ)
Akira Endo (HiLase)
Henryk Fiedorowicz (Military University of Technology, Poland)
Torsten Feigl (OptiXfab)
Igor Fomenkov (ASML)
Joost W. M. Frenken (ARCNL)
Debbie Gustafson (Energetiq)
Ahmed Hassanein (Purdue)
Takeshi Higashiguchi (Utsunomia University)
Stephen Horn (Energetiq)
Larissa Juschkin (RWTH Aachen University)
R. Joseph Kline (NIST)
Konstantin Koshelev (ISAN)
Rainer Lebert (Research Instruments)
Peter Loosen (ILT-Fraunhofer)
Eric Louis (University of Twente)
Thomas Metzger (Trumpf)
Hakaru Mizoguchi (Gigaphoton)
Fergal O'Reilly (UCD)
Gerry O'Sullivan (UCD)
Yuriy Platonov (RIT)
Ladislav Pina ((Czech Technical University, Prague)
Jorge Rocca (University of Colorado)
Akira Sasaki (JAEA)
Leonid Shmaenok (PhysTex)
Emma Sokell (UCD)
Atsushi Sunahara (Purdue)
Yusuke Teramoto (BLV Licht)
Hironari Yamada (PPL)
Mikhail Yurkov (DESY)
Takayuki Uchiyama (Toshiba)
Oscar Versolato (ARCNL)
Sergey Zakharov (NAEXTSTREAM)
Wim van der Zande (ASML)
Vivek Bakshi (EUV Litho, Inc.) - Chair

Agenda

2018 Source Workshop

Agenda Outline (Oct 23, 2018 Update)

Monday, November 5, 2018

Location: Faculty of Nuclear Sciences & Physical Engineering Building, Czech Technical University, Brehova 7, Prague 1.
(Located 1 min. walk from metro station "Staromestska" (green line A). Map link.)

5:30 - 7:00 PM	On-site Registration Reception and Speaker Prep

No Bus Pickup has been planned for Monday evening reception for attendees. The reception location is downtown Prague. Please check location of your hotels to estimate the distance to the university. You can either take public transportation to metro station or take a taxi to the reception.

Tuesday, November 6, 2018

Location: ELI Auditorium (Located across from HiLASE)
(HiLASE location map link)

Physical Address:
Hilase Centre,
Za Radnicí 828, 252 41 Dolní Břežany
Středočeský kraj

8:15 AM	Bus Pickup for HiLASE The pick up will be limited to three hotels that are listed on the workshop site as suggested hotels for attendees. Please see hotel and

	transportation information for information. Pickup time and location for bus pickups will be announced this week.
8:45 AM -9:15 AM	Tea/Coffee and Biscuits Registration
9:15 AM – 12:30 PM	Workshop Presentations
12:30 PM – 1:30 PM	Lunch
1:30 PM – 5:00 PM	Workshop Presentations
5:30 PM – 6:30 PM	Poster Session

(Buses will be available to take workshop attendees back to hotels after the poster session.)

Wednesday, November 7, 2018

Location: ELI Auditorium (Located across from HiLASE)

8:15 AM	Bus Pickup Same as on Tuesday.
8:45 AM -9:15 AM	Tea/Coffee and Biscuits
9:15 – 12:30 PM	Workshop Presentations
12:30 PM - 2:00 PM	Lunch (Cafeteria) Source Workshop Technical Working Group Meeting (Closed)
2:00 PM – 6:30 PM	Oral Presentations
7:00 PM	Dinner

(Dinner is planned at a location next to HiLASE. We will walk to dinner after the workshop. After dinner, buses will be available to take participants back to hotels.)

WORKSHOP AGENDA

2018 Source Workshop

November 5-7, 2018, Prague, Czech Republic

Tuesday, November 6, 2018
(HiLASE – ELI Auditorium)

9:30 AM Announcements and Introductions

Welcome -2018 Source Workshop
Vivek Bakshi
EUV Litho, Inc., USA

Welcome to HiLASE
Tomas Mocek
HiLASE

Announcements and Introductions (Intro-1)
Padraig Dunne
UCD

9:50 AM Session 1: Keynote Session -1

Session Chair: Tomas Mocek (HiLASE)

Laser Produced Plasma Light Sources for Short Wavelength Applications (S3)

Gerry O'Sullivan
University College Dublin, Belfield, Dublin 4, Ireland

Award Presentation

Break 10:30(20 Mins)

10:50 AM Session 2: Blue-X - I

Session Chair: Padraig Dunne (UCD) and Hans Hertz (KTH)

Blue-X – the New Frontier (S11)
Vivek Bakshi
EUV Litho, Inc.

Liquid-jet laser-plasma sources for sub-5-nm emission (S17) (Invited Talk)
Hans M Hertz
Biomedical and X-Ray Physics, Dept of Applied Physics, KTH/Albanova, Stockholm, Sweden

A Water Window Source for Soft X-Ray Microscopy and other Applications (S16) (Invited Talk)
Paul Sheridan[1], Alberto Manzoni[1], Aodh O Connor[1], Ciaran Rogers[1], David Rogers[1], Dunja Skoko[1], Fergal O Reilly[1,2], Gordon Murray[1], Isaac Tobin[1], James Costello[1], Jason Howard[1,2], Kenneth Fahy[1], Martina Donnellan[1], Stephen Brady[1], Tony Donnelly[1], Tony McEnroe[1], William Fyans[1]
[1]SiriusXT Ltd, Dublin, Ireland
[2]School of Physics, UCD Dublin, Ireland

Recent Advances in Development and Application of Compact Laser-Plasma Soft X-ray Sources based on a Gas-Puff Target (S12) (Invited Talk)
Henryk Fiedorowicz, Andrzej Bartnik, Przemysław Wachulak, Karol Janulewicz, Roman Jarocki, Jerzy Kostecki, Tomasz Fok, Łukasz Węgrzyński
Institute of Optoelectronics, Military University of Technology, Warsaw, Poland

Wavelength and Brilliance Scaling Potential of Discharge based XUV Sources (S13) (Invited Talk)
Klaus Bergmann, Lars Behnke, Alexander von Wezyk, Jochen Vieker
Fraunhofer Institute for Laser Technology – ILT, Steinbachstr. 15, 52074 Aachen, Germany

Xe Laser-Plasma EUV Source – from 13.5 nm to 11 nm: Researche to Optimize the Xe LPP 11-nm Source (S14)
S Kalmykov, M Sasin, et al
Ioffe Institute, St. Petersburg, Russia

12:50 PM Lunch (60 minutes)

1:50 PM Session 3: Blue-X – II

Session Chair: Torsten Feigl (optiXfab) and Oscar Versolato (ARCNL)

Multilayer Optics for 1 nm to 13.5 nm: Can We Reduce the Lithography Wavelength Further? (S18) (Invited Talk)
Torsten Feigl[a], Marco Perske[a], Hagen Pauer[a], Tobias Fiedler[a], Philipp Naujok Christian Laubis[b], Frank Scholze[b]
[a]optiX fab GmbH, Hans-Knöll-Str.6, 07745 Jena, Germany
[b]Physikalisch-Technische Bundesanstalt, Abbestr. 2-12, 10587 Berlin, Germany

Depth-modified Bragg Mirrors for sub-10-nm Wavelengths (S19)
R. Meisels and F. Kuchar **(Invited Talk)**
Institute of Physics, Montanuniversität Leoben, 8700 Leoben, Austria

New Architectures for PW-Scale High Peak Power Lasers Scalable to Near-MW Average Powers and Their Application to EUV Generation (S15) (Invited Talk)
C.W. Siders, S. Langer, A.J. Bayramian, A.C. Erlandson, T.C. Galvin, E.F. Sistrunk, T.M. Spinka, and C. L. Haefner
Advanced Photon Technologies, Lawrence Livermore National Laboratory, NIF & Photon Science Directorate, 7000 East Avenue, Livermore CA 94550

2:50 PM Break and Group Photograph (25 Minutes)

3:10 PM Session 4: Lasers

Session Chair: Akira Endo (HiLASE) and Thomas Metzger (Trumpf)

Beam Quality of Pulsed High-power CO_2-Lasers for EUV Lithography (S36) (Invited Talk)
Johannes Kaschke
TRUMPF Lasersystems for Semiconductor Manufacturing GmbH, Johannes-Maus-Str.2, 71254 Ditzingen, Germany

Progress on laser-driven soft x-ray lasers at LOA (S32) (Invited Talk)
S. Sebban[1], E. Oliva[2], M. Zürch[3], A. Depresseux[1], F. Tissandier[1], J.P. Goddet[1], A. Tafzi[1], F. Tuitje[3], T. Helk[3], C. Spielmann[3], M. Kozlova[4], J. Nejdl[4], G. Maynard[5] and J. Gautier[1]
1) LOA, Université Paris-Saclay, 91762 Palaiseau cedex, France;
2) Universidad Politécnica de Madrid, E-28006, Madrid, Spain;
3) Institute of Optics and Quantum Electronics, Abbe Center of Photonics, Jena
4) ELI Beamlines project, Institute of Physics of AS CR, v. v. i.

Na Slovance 2, 182 21, Prague 8, Czech Republic
5) LPGP, CNRS-Université Paris Sud 11, Orsay, France

Technologies and Applications of High-average-power Lasers at HiLASE (S33) (Invited Talk)
Tomas Mocek
HiLASE Centre, Institute of Physics of the Czech Academy of Sciences, Za Radnici 828, 25241 Dolni Brezany, Czech Republic

Ultrafast Thin-Disk Amplifiers (S35) (Invited Talk)
Thomas Metzger
TRUMPF Scientific Lasers GmbH & Co. KG, Feringastr. 10a, 85774 Unterföhring, Germany

Quantum Technology and kW, ps thin disc lasers (S34) (Invited Talk)
Akira Endo
HiLASE Centre, Institute of Physics CAS, Za Radnicí 828, 252 41 Dolní Břežany, Czech Republic

High-harmonic Generation for EUVL: Source Developments and Applications for Spectroscopy and Metrology (S31) (Invited Talk)
Peter Kraus
ARCNL, Science Park 110, NL-1098 XG Amsterdam, The Netherlands

5:15 PM Break (15 Minutes)

5:30 Session 5 Poster Session

Session Chairs: Vivek Bakshi (EUV Litho, Inc.) and Padraig Dunne (UCD)

Lasers

High-Harmonic Generation for EUV Frequency-Comb Spectroscopy of He^+ (S37)
J. Weitenberg,[1,2] A. Ozawa,[1] P. Rußbüldt,[2] D. Esser,[2] F. Schmid,[1] J. Schulte,[2] H.-D. Hoffmann,[2] R. Poprawe,[2,3] , Th. Udem,[1] Th. W. Hänsch[1,4]
[1] Max-Planck Institute of Quantum Optics MPQ, Hans-Kopfermann-Str. 1, 85748 Garching, Germany
[2] Fraunhofer Institute for Laser Technology ILT, Steinbachstr. 15, 52074 Aachen, Germany
[3] RWTH Aachen University, Chair for Laser Technology LLT, Steinbachstr. 15, 52074 Aachen, Germany

[4] *Ludwig-Maximilian University Munich LMU, Faculty of Physics, Chair of Experimental Physics, Schellingstr. 4/III, 80799 München, Germany*

0.5-kW Picosecond Thin-disk Laser System for Pre-pulsing in High-power EUV Sources (S38)

J. Mužík, M. Smrž, M. Chyla, O. Novák, A. Endo, T. Mocek
HiLASE Centre, Institute of Physics CAS,
Za Radnicí 828, 252 41 Dolní Břežany, Czechia

High-energy Burst-mode Thin-disk Multipass Amplifier for Laser Compton X-ray Source (S39)

Siva Sankar Nagisetty[1,2], Michal Chyla[1], Martin Smrž[1], Akira Endo[1] and Tomáš Mocek[1]
[1)] HiLASE Centre, Institute of Physics AS CR, v.v.i. Za Radnicí 828, Dolní Břežany 252 41, Czech Republic
[2)] Czech Technical University in Prague, Břehová 7, Prague 115 19, Czech Republic

Development of a High-energy, Cryogenically-cooled Yb:YAG Laser System (S40)

Paweł Sikociński, Martin Smrz, Akira Endo and Tomas Mocek
HiLASE Centre, Institute of Physics of the Czech Academy of Sciences, Za Radnicí 828, 252 41 Dolní Břežany, Czech Republic

Adopting Crab Crossing to Laser-Compton Scattering X-ray (S70)

Yuya Koshiba[1], Shogo Ota[1], Ryosuke Morita[1], Kazuyuki Sakaue[1, 2], Masakazu Washio[1], Akira Endo[1, 3], Takeshi Higashiguchi[4], Junji Urakawa[5]
[1)] Research Institute for Science and Engineering, Waseda University, 3-4-1 Okubo, Shinjuku-ku, Tokyo, 169-8555, Japan
[2)] Photon Science Center, Graduate School of Engineering, The University of Tokyo, 7-3-1 Hongo, Bunkyo-ku, Tokyo 113-8656, Japan
[3)]HiLASE Centre, Institute of Physics AS CR, Za Radnicí 828, 252 41 Dolní Břežany, Czech Republic
[4)]Utsunomiya University, 7-1-2 Yoto, Utsunomiya, Tochigi, 321-8585, Japan
[5)]High Energy Accelerator Research Organization, 1-1 Oho, Tsukuba, Ibaraki 305-0801 Japan

Laser Produced Plasma (LPP)

EUV-induced Plasma of Hydrogen with Nitrogen Admixture (S45)

P. V. Krainov[1,2], B. Wedershoven[3], Yu. Mankelevich[4], M. van Kampen[3], D. I. Astakhov[2], V. V. Medvedev[2], K. N. Koshelev[2], A. M. Yakunin[3], and M. van de Kerkhof[3]
1 Moscow Institute of Physics and Technology (State University), Institutsky

pereulok 9, Dolgoprudny, Moscow region 141701, Russia
2 Institute for Spectroscopy RAS (ISAN), Fizicheskaya str. 5, Troitsk, Moscow 108840, Russia
3 ASML Netherlands B.V., De Run 6501, 5504DR Veldhoven, The Netherlands
4 Skobel'tsyn Institute of Nuclear Physics, Lomonosov Moscow State University, Leninskie gory, Moscow 119991, Russia

Validation of Radiation Hydrodynamic Model against Experiment with CO_2-laser-produced tin Plasma (S46)
B.V. Lakatosh[1], D.B. Abramenko[2,3], A.S. Grushin[4], V.V. Ivanov[2,3], V.M. Krivtsun[2,3] and V.V. Medvedev[2,3]
[1] Moscow Institute of Physics and Technology (State University), Institutsky pereulok 9, Dolgoprudny, Moscow region 141701, Russia
[2] RnD-ISAN/EUV Labs, Sirenevy Bulevard Str. 1, Troitsk, Moscow, 108840, Russia
[3] Institute for Spectroscopy RAS, Fizicheskaya str. 5, Troitsk, Moscow 108840, Russia
[4] Keldysh Institute of Applied Mathematics RAS, Miusskaya sq. 4, Moscow 125047, Russia

Metrology Sources

Xenon plus additives in the Energetiq EQ-10: Initial Results (S57)
Kosuke Saito, Stephen F. Horne, Don Smith, Matt Partlow, Debbie Gustafson, Matt Besen, Paul Blackborow , Michael Roderick
Energetiq Technology, Inc.

The Extendibility of the Maintenance- interval of a Discharge based EUV Source (S58)
Jochen Vieker and Klaus Bergmann
Fraunhofer Institute for Laser Technology – ILT, Steinbachstr. 15, 52074 Aachen, Germany

Advances in Laser-heated Discharge-plasma Sources (S59)
Florian Melsheimer[1,2,3,4], Detlev Grützmacher[2,4,5], Larissa Juschkin[1,2,4]
[1] RWTH Aachen University, Experimental Physics of EUV, Germany
[2] Forschungszentrum Jülich GmbH, Institute for Semiconductor Nanoelectronics, Peter Grünberg Institut-9, 52425 Jülich Germany
[3] Fraunhofer Institute for Laser Technology, Steinbachstraße 15, 52074 Aachen, Germany
[4] JARA-FIT, Forschungszentrum Jülich GmbH and RWTH Aachen University, Germany
[5] Forschungszentrum Jülich GmbH, JARA-Institute for Green-IT, Peter Grünberg Institute -10, 52425 Jülich, Germany

EUV PLASMA SOURCE AT HILASE (S60)

Chiara Liberatore[1], Matthias Müller[2] , Jonathan Holburg[2] , Michal Chyla[1], Klaus Mann[2] , Simon Hutchinson [1], Akira Endo[1], Alexander V. Bulgakov[1], Nadezhda M. Bulgakova[1], Tomas Mocek[1]

[1] HiLASE Centre, Institute of Physics CAS, Za Radnicí 828, 252 41 Dolní Břežany, Czech Republic

[2] Laser-Laboratorium Göttingen e.V., Hans-Adolf-Krebs-Weg 1, 37077 Göttingen, Germany

Metrology

Free-standing Carbon Nanotube Membranes for Applications in Extreme - ultraviolet and Soft X-ray Optics (S61)

V. M. Gubarev[1,2], Yu. G. Gladush[3], M. G. Sertsu[4], V. Y. Yakovlev[3], O. F. Yakushev[1], V. M. Krivtsun[1,5], V. V. Medvedev[1,5], A. Sokolov[4], F. Schafers[4], A. G. Nasibulin[3,6] and K.N. Koshelev[1,5]

[1] RnD-ISAN/EUV Labs, Troitsk, Moscow 108840, Russia

[2] Moscow Institute of Physics and Technology (State University), Institutskiy pereulok str. 9, Dolgoprudny, Moscow region 141701, Russia

[3] Skolkovo Institute of Science and Technology, Moscow 143026, Russia

[4] Helmholtz Zentrum Berlin (BESSY-II), Albert-Einstein-Strasse 15, D-12489 Berlin, Germany

[5] Institute for Spectroscopy of the Russian Academy of Science, Moscow, Troitsk, Russia

[6] Department of Applied Physics, Aalto University, 15100, FI-00076 Aalto, Espoo, Finland

Design and Evaluation of a Focusing EUV Monochromator for Laboratory-based Photoemission-electron Microscopy beyond He II (S62)

Daniel Wilson [1,2], Gordon Staab [2,3], Detlev Grützmacher [3,4], Claus M. Schneider [1], and Larissa Juschkin [2,3]

[1] Peter Grünberg Institut 6 (PGI-6), Forschungszentrum Jülich GmbH, JARA-FIT, 52425 Jülich, Germany

[2] Experimental Physics of EUV, RWTH Aachen University, JARA-FIT, Steinbachstraße 15, 52074 Aachen, Germany

[3] Peter Grünberg Institut 9 (PGI-9), Forschungszentrum Jülich GmbH, JARA-FIT, 52425 Jülich, Germany

[4] JARA-FIT Institute Green IT (PGI-10), Forschungszentrum Jülich GmbH and RWTH Aachen University, 52425 Jülich, Germany

Monitoring EUV and DUV spectral emission ratios of a high power EUVL source (S63)

Muharrem Bayraktar[1], Fei Liu[2], Bert Bastiaens[3], Caspar Bruineman[4] and Fred Bijkerk[1]
[1] Industrial Focus Group XUV Optics, MESA + Institute for Nanotechnology, University of Twente, The Netherlands
[2] ASML Netherlands B.V., De Run 6501, 5504 DR Veldhoven, The Netherlands
[3] Laser Physics and Nonlinear Optics, MESA + Institute for Nanotechnology, University of Twente, The Netherlands
[4] Scientec Engineering, The Netherlands

A Single-shot NEXAFS Spectroscopy using Laser Plasma Double Stream Gas Puff Target SXR Source (S64)

Martin Duda[1,2], Przemysław Wachulak[3], Tomasz Fok[3], Łukasz Węgrzyński[3], Alexandr Jančárek[2] and Henryk Fiedorowicz[3]
[1]HiLASE Centre, Institute of Physics CAS, Za Radnicí 828, 252 41 Dolní Břežany, Czech Republic
[2]Faculty of Nuclear Sciences and Physical Engineering, Czech Technical University in Prague, Břehová 7, 115 19 Praha 1 Prague, Czech Republic
[3]Institute of Optoelectronics, Military University of Technology, 2 Urbanowicza Str., 09-908 Warsaw, Poland

Soft X-ray Spectroscopy and Microscopy using a Table-top Laser-induced Plasma Source (S65)

Matthias Müller, Jonathan Holburg, and Klaus Mann
Laser-Laboratorium Göttingen e.V., Hans-Adolf-Krebs-Weg 1, 37077 Göttingen, Germany

Study of Light Sources in the Soft X-ray Region for the Development of a Tabletop Microscope (S66)

M. Olszewski, H. Weltz[1], T. Donelly, G. Joseph, P. Dunne, F. O'Reilly
Department of Physics, UCD, Dublin, Ireland
[1]Phelma , Grenoble INP

Wednesday November 7, 2018

9:30 AM Announcements (Intro-2)

9:50 AM Session 6: Keynote 2

Session Chair: Ladislav Pina (CTU and Rigaku)

EUV Source for Lithography: Readiness for HVM and Outlook for Increase in Power and Availability (S1)
Igor Fomenkov
ASML US LP, San Diego, CA 92127, USA

High Power LPP-EUV Source with Long Collector Mirror Lifetime for Semiconductor High Volume Manufacturing (S2)
Hakaru Mizoguchi
Gigaphoton Inc., Hiratsuka Kanagawa,254-8567, JAPAN

11:10 AM Break (20 minutes)

11:30 PM Session 7: Metrology Sources

Session Chairs: Klaus Bergman (Fraunhofer) and Samir Ellwi (ISTEQ)

Characterization and Performance Improvement of Laser-assisted and Laser driven EUV sources for Metrology Applications (S56) (Invited Talk)
Yusuke Teramoto[1], Bárbara Santos[1], Guido Mertens[1], Margarete Kops[1], Ralf Kops[1], Reza Bayemani[1], Klaus Bergmann[2]
[1]BLV Licht- und Vakuumtechnik GmbH / Ushio Inc., Steinbachstrasse 15, 52074 Aachen, Germany
[2]Fraunhofer ILT, Steinbachstrasse 15, 52074 Aachen, Germany

High-brightness Light Source Based on a New Concept of LPP for Actinic EUV microscopy and Metrology Applications (S54) (Invited Talk)
Konstantin Koshelev[1,2], Alexander Vinokhodov[1] , Oleg Yakushev[1], Dimitri Abramenko[1] , Alexander Lash[1], Mikhail Krivokorytov[1,2], Yuri Sidelnikov[2] , Vladimir Ivanov[2] , Vladimir Krivtsun[2], Vyacheslav Medvedev[1], Denis Glushkov[3], Pavel Seroglazov[3], Samir Ellwi[3]
[1]RnD-ISAN/EUV Labs, Troitsk, 108840 Russia
[2]Institute for Spectroscopy RAS, Troitsk, 108840 Russia
[3]ISTEQ, 5656 AG Eindhoven, The Netherlands

Mixed gas fueling experiments on the Energetiq EQ-10 (S52) (Invited Talk)
Stephen F. Horne, Ron Collins, Michael Roderick, Don Smith, Matt Partlow, Debbie Gustafson, Matt Besen, Paul Blackborow
Energetiq Technology, Inc.

Electron impact type laboratory EUV source for metrology and imaging (S55) (Invited Talk)
Ladislav Pina
Rigaku and Czech Technical Universit, Prague

EUV/X-ray Sources driven by New-generation of Lasers for User-applications at ELI Beamlines (S51) (Invited Talk)
Jaroslav Nejdl
ELI Beamlines project, Institute of Physics AS CR,
Na Slovance 2, 182 21, Prague 8, Czech Republic

1:30 PM Lunch and Steering Committee Meeting

3:00 PM Session 8: FEL

Session Chair: Hiroshi Kawata (KEK) and Akira Endo (HiLASE)

Upgrade plan of cERL for the POC as a First-Stage of the Development on EUV-FEL High-power Light Source (S21) (Invited Talk)
Hiroshi Kawata, Norio Nakamura, and Ryukou Kato
High Energy Accelerator Research Organization (KEK), Tsukuba, Ibaraki 305-0801, Japan

Surface Ablation by Soft X-ray Laser Pulse for EUV nano-scale fabrication (S22) (Invited Talk)
Masaharu Nishikino
Kansai Photon Science Institute, QST, Kizugawa Kyoto, 619-0215, Japan

Laser-cooled Electron Source (S23) (Invited Talk)
Jom Luiten
Eindhoven University of Technology, The Netherlands

Fs-laser driven free-electron laser development in ELI-BL (S24)
Alexander Molodozhentsev[1], Georg Korn[1], Andreas Maier [2,3], Florian Gruner[2]
[1]*IoP CAS, ELI-BL*
[2]*CFEL, DESY*
[3]*University of Hamburg*

4:20 PM Break

4:40 PM Session 9: LPP Sources

Session Chair: Joost Franken (ARCNL) and Konstantin Koshelev (RnD-ISAN)

Nd:YAG-laser-driven Sn plasma: an ARCNL research update (S41) (Invited Talk)
O. O. Versolato
Advanced Research Center for Nanolithography (ARCNL), Science Park 110, 1098 XG Amsterdam, The Netherlands

Tin-ion Interactions (S42) (Invited Talk)
Ronnie Hoekstra
Advanced Research Center for Nanolithography (ARCNL),
Science Park 110, 1098 XG Amsterdam, the Netherlands and
Zernike Institute for Advanced Materials, University of Groningen, 9747 AG Groningen, the Netherlands

Influence of Opacity in Nd:YAG Laser-produced Tin-Plasmas (S43)
R Schupp[1], F Torretti[1,2], J Colgan[3], J Scheers[1,2], R Hoekstra[4], W Ubachs[2], O O Versolato[1]
1. *Advanced Research Center for Nanolithography, Science Park 110, 1098 XG Amsterdam, The Netherlands*
2. *Free University Amsterdam, De Boelelaan 1105, 1081 HV Amsterdam, The Netherlands*
3. *Los Alamos National Laboratory, Los Alamos, NM 87545, USA*
4. *University of Groningen, Broerstraat 5, 9712 CP Groningen, The Netherlands*

EUV & Soft X-ray Sources based on Medium-Z LPPs (S44) **(Invited Talk)**
P. Dunne, E. White, F. O'Reilly, M Olszewski, E. Sokell, T. Miyazaki & G. O'Sullivan
School of Physics, University College Dublin, Belfield, Dublin 4, Ireland

Computer modeling of contamination and cleaning of EUV source optics (S47) (Invited Talk)
Dmitry Astakhov
RnD- ISAN

6:20 PM Announcements

6:30 PM Workshop Adjourned – Depart for Dinner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