PXRNMS2023 Program

Oral Presentation
Wednesday, 11th Oct.

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Conference Place: Medium Hall of Acrea Himeji
https://www.himeji-ccc.jp/img/pdf/pamphlet_A4-en-202304.pdf

9:00 **Coffee & Sandwitch**

9:55 **Opening Remarks**

Takeo Watanabe (Univ. of Hyogo)

(Keynote)
10:05 Development and Application of Multilayer Mirror 13

Hisataka Takenaka (TOYAMA)

(Invited)
10:45 Tailoring the nanoscale multilayer optics with high efficiency and precision for EUV, X-ray and Neutron applications 14

Qiushi Huang, Runze Qi, Zhe Zhang, Zhong Zhang , Wenbin Li, Shengzhen Yi, Zhanshan Wang (Tongji University)
Igor V. Kozhevnikov (Shubnikov Institute of Crystallography))

11:10 **— Coffee Break (30 min)—**

(Invited)
11:40 Interface characterization of neutron and X-ray multilayer using Grazing Incidence X-ray Absorption & Fluorescence spectroscopy experiments at Indus-2 SRS 15

Arup Biswas (Bhabha Atomic Research Centre)

(Invited)
12:05 Current Status and Prospcet for EUV Lithograpy Which Is a Significant Application Using Multilayers 16

Takeo Watanabe, Tetsuo Harada, and SHinji Yamakawa (Univ. of Hyogo)

12:30 **— Lunch (90 min) with Lunch box @ 409 meeting room —**

(Invited)
14:00 Resolving and improving the interfaces of Soft X-ray Multilayers 17

Marcelo Ackermann (Univ. of Twente)

14:25 High Reflective C/B Multilayer for Beyond EUV Lithography 18

Tetsuo Harada, Umi Fujimoto, Shinji Yamakawa, Takeo Watanabe (Univ. of Hyogo)

14:45 **— Coffee Break (30 min)—**

15:15 **Poster Presentations (120 min) @ Foyer of Medium Hall**

17:15 **Communication Party @ Foyer of Medium Hall**

Oral Presentation
Thurthday, 12th Oct.

8:30 **Coffee & Sandwitch**

(Invited)

9:00 Multilayer reflective optics for intense high-energy X-rays at SPring-8 19

Takahisa Koyama (Japan Synchrotron Radiation Research Institute (JASRI))

9:25 Highly efficient ultra-low blaze angle multilayer grating 20

Dmitriy Voronov, Sooyeon Park, Eric Gullikson, Farhad Salmassi and Howard Padmore
(Lawrence Berkeley National Laboratory)

9:45 Multilayer-coated blazed grating for high transmission tender X-ray energy range monochromator 21

Andrey Sokolov, Stephanie Lemke, Svyatoslav Alimov, Jeniffa Knedel, Oliver Kutz, Tino Seliger, Grzegorz Gwalt, Franz Schfers, Friedmar Senf, Frank Siewert, Jens Viefhaus
(Helmholtz-Zentrum Berlin fr Materialien und Energie, BESSY-II, Berlin, Germany)
Qiushi Huang, Yeqi Zhuang, Runze Qi, Zhong Zhang, Wenbin Li, Zhanshan Wang
(Key Laboratory of Advanced Micro-Structured Materials MOE, Institute of Precision Optical Engineering, School of Physics Science and Engineering, Tongji University, Shanghai, China)

10:05 **— Coffee Break (30 min)—**

10:35 Optimisation of Cr/Sc-based multilayer coatings for water window applications 22

Evgueni Meltchakov, Sbastien de Rossi, Eirini Papagiannouli, Franck Delmotte
(Universit Paris-Saclay, Institut d'Optique Graduate School)
Blandine Capitanio, Pascal Mercere (Synchrotron Soleil)

10:55 Synthesis and characterization of short- and ultrashort W-based multilayers for soft x-rays 23

Dennis IJpes, Andrey E. Yakshin, Jacobus M. Sturm, Marcelo D. Ackermann
(University of Twente)

11:15 NiV-based Multilayer for Soft and Hard X-ray Mirrors 24

Zhe Zhang, Qiushi Huang, Runze Qi, Zhong Zhang, Zhanshan Wang
(Key Laboratory of Advanced Micro-Structured Materials MOE, Institute of Precision Optical Engineering, School of Physics Science and Engineering, Tongji University, Shanghai, P. R. China)

11:35 **— Lunch with Lunch box @ 409 meeting room —**

13:00 **Bus DEPARTURE time @ Acrea Himeji**
To Excursion of SPring-8, SACLA, NewSUBARU synchrotron facility

17:00 **Bus Arrival time @ Himeji Station**

Himeji Station South Charter Bus Boarding Area

https://goo.gl/maps/PYdjtS6vETic68cQ6

18:00 **Bus DEPARTURE time @ Himeji Station**
To Banquet at NADA-GIKU Japanese Sake Traditional Restaurant

19:00 **Banquet 120 min**

21:30 **Bus Arrival time @ Himeji Station**

Oral Presentation
Friday, 13th Oct.

8:30 **Coffee & Sandwitch**

(Invited)

9:00 Wide Bandwidth Neutron-Spin Polarizer Due to Ferromagnetic Interlayer Exchange Coupling 25

Ryuji Maruyama (Japan Atomic Energy Agency (JAEA))

(Invited)

9:25 11B4C-containing Ni/Ti multilayer neutron optics 26

Fredrik Eriksson, Sjoerd Stendahl, Naureen Ghafoor, Anton Zubayer, and Jens Birch (Linkping University, Sweden)
Mattias Schwartzkopf (DESY, Hamburg, Germany)

9:50 Material design optimization for large-m 11B4C-based Ni/Ti supermirror neutron optics 27

Naureen Ghafoor, Sjoerd Stendahl, Anton Zubayer, Marcus Lorentzon, *Alexei Vorobiev, Jens Birch, Fredrik Eriksson
(Department of Physics, Chemistry, and Biology, IFM, Linkping University, Sweden, *Department of Physics and Astronomy, Material Physics, Uppsala University, Sweden, and Institut Max von LauePaul Langevin (ILL), Grenoble, France)

10:10 10B/11B-modulated chemically homogeneous boron carbide neutron interference mirrors 28

Jens Birch, Sjoerd Stendahl, Samira Dorri, Anton Zubayer, Naureen Ghafoor, Fredrik Eriksson (Linkping University)

10:30 **— Coffee Break (30 min)—**

(Invited)

11:00 All-dielectric multilayer mirrors tuned at vacuum ultraviolet wavelengths 29

Paloma López-Reyes, Nuria Gutirrez-Luna, Carlos Honrado-Bentez, and Juan Ignacio Larruquert (GOLD-IO-CSIC Instituto de ptica Consejo Superior de Investigaciones Cientficas, Serrano 144, 28006 Madrid, Spain)

11:25 Design Study of Soft X-Ray Aplanat with Four Multilayer Mirrors in Grazing Incidence Configuration 30

S. Yamashita, M. Toyoda (Tokyo Polytechnic University)

11:45 Thermally stable MoNx/Si1-xNx multilayer as a substrate for XSW study of SMSI 31

Atul Tiwari, Matteo Monai, Ksenia Matveevskii, Sergey N. Yakunin, Marcelo D. Ackermann, Laurens D. B. Mandemaker, Florian Meirer and Igor A. Makhotkin
(Industrial Focus Group XUV Optics, MESA+ Institute for Nanotechnology, University of Twente, Enschede, Netherlands)

12:05 Surface roughening by ion beams: Is ballistics “be-all and end-all”? 32

Parikshit Phadke, Jacobus M. Sturm, Fred Bijkerk, Marcelo D. Ackermann (University of Twente)

12:25 **— Lunch (90 min) with Lunch box @ 409 meeting room —**

(Invited)

13:55 More accurate prediction of optical constants: A prerequisite for the development of next-generation metrology instruments based on soft X-rays 33

Victor Soltwisch (PTB)

14:20 Bayesian Inferences and Time-Frequency Analysis Assisted Determination of Optical Constants in the EUV 34

Qais Saadeh, Victor Soltwisch, Christian Laubis, Michael Kolbe, and Frank Scholze (PTB)

14:40 Refractive index measurements with improved accuracy for EUV/x-ray multilayer optics 35

Franck Delmotte, Eirini Papagiannouli (Universit Paris-Saclay)
Regina Soufli, Catherine Burcklen (Lawrence Livermore National Laboratory)
Farhad Salmassi, Eric Gullikson (Lawrence Berkeley National Laboratory)

15:00 **Closeing Remarks**

Poster Program

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The poster board will be availavle from the morning of 11th to the end of th conference.
The board size is W1200 mm x H1800 mm.
(Recommended poster format: A0 Portrait)

8 Improved performance of polarizing Fe/Si multilayer neutron optics by 11B4C incorporation 46

A. Zubayer1, N. Ghafoor1, K. rarinsdttir2, S. Stendahl1, A. Glavic3, J. Stahn3, G. Nagy4, G. Greczynski1, M. Schwarzkopf5, A. Le Febvrier1, P. Eklund1, J. Birch1, F. Magnus2, F. Eriksson1
(1. Thin Film Physics Division, Department of Physics, Chemistry and Biology (IFM), Linkping University, SE-581 83 Linkping, Sweden
2. Science Institute, University of Iceland, Dunhaga 3, IS-107 Reykjavik, Iceland
3. Paul Scherrer Institut, 5232, Villigen PSI, Switzerland
4. Department of Physics and Astronomy, Uppsala University, SE-75120, Uppsala, Sweden
5. Photon Science, DESY, Notkestrae 85, 22607, Hamburg, Germany)

~~9 CeMOX, a Collaborative facility for Development of High-Performance Multilayer Optics~~ (Withdraw)

~~Capitanio Blandine (Synchrotron-soleil, Gif-sur-Yvette)~~

10 Removal of Mo/Si Multilayer Coatings on Fused Silica Substrates by Wet Chemical Etching 47

Mitsunori TOYODA, Ryo YOKOYAMA, Shuntaro WAKI, Jun CHEN
(Tokyo Polytechnic University)
Toshiyuki KAKUDATE(Tohoku University)

11 Picometer Sensitivity on Laboratory-based XRR Instrument Equipped with Fast and Accurate Sample Alignment System 48

Hitoshi Morioka (Bruker Japan K.K.)
Fernando Rinaldi, Martin Zimmermann (Bruker AXS GmbH)

12 At-Wavelength Metrology for diffractive and reflective optics in the EUV, XUV and tender X-ray energy range 49

Andrey Sokolov, Frank Eggenstein, Peter Bischoff, Peter Baumgrtel, Matthias Mast, Marcel Mertin, Ingo Packe, Franz Schfers, Frank Siewert, Jens Viefhaus (Helmholtz-Zentrum Berlin fr Materialien und Energie (BESSY-II), Berlin)

~~13 Ultra-low thickness thin film multilayer devices for application in Water Window regime of Soft X-ray~~ (Withdraw)

~~Piyali Sarkar Roy, Arup Biswas, Dibyendu Bhattacharyya (Atomic and Molecular Physics Division, Bhabha Atomic Research Centre, Mumbai-400085, INDIA)~~

~~14 Structural, electrical and magnetic properties of reactively DC sputtered Cu and Ti thin films. Application to CuTi neutron supermirrors for low spin-flip applications~~ (Withdraw)

~~Jose Manuel Gómez-Guzmán, Peter Link (Heinz Maier-Leibnitz Zentrum, Technische Universität München, Germany)~~
~~Matthias Opel (Walther-Meißner-Institut, Bayerische Akademie der Wissenschaften, Germany)~~
~~Tamás Veres (Budapest Neutron Center, Centre for Energy Research , Hungary)~~
~~László Bottyán (Wigner Research Centre for Physics, Hungary)~~

15 Low-Cost Cleaning Method of Mo/Si Multilayer Soft X-ray Mirrors Using a Wet Process 50

Toshiyuki Kakudate (National Institute of Technology (KOSEN), Hachinohe College)
Mitsunori Toyoda (Tokyo Polytechnic University)