

13th International X-ray Microscopy Conference (XRM 2016)

Journal of Physics: Conference Series Volume 849

Oxford, United Kingdom
15 – 19 August 2016

ISBN: 978-1-5108-4266-3
ISSN: 1742-6588

Printed from e-media with permission by:

Curran Associates, Inc.
57 Morehouse Lane
Red Hook, NY 12571



Some format issues inherent in the e-media version may also appear in this print version.

Copyright© (2016) by the Institute of Physics
All rights reserved. The material featured in this book is subject to
IOP copyright protection, unless otherwise indicated.

Printed by Curran Associates, Inc. (2017)

For permission requests, please contact the Institute of Physics
at the address below.

Institute of Physics
Dirac House, Temple Back
Bristol BS1 6BE UK

Phone: 44 1 17 929 7481
Fax: 44 1 17 920 0979

techtracking@iop.org

Additional copies of this publication are available from:

Curran Associates, Inc.
57 Morehouse Lane
Red Hook, NY 12571 USA
Phone: 845-758-0400
Fax: 845-758-2633
Email: curran@proceedings.com
Web: www.proceedings.com

Table of contents

Volume 849

X-Ray Microscopy Conference 2016 (XRM 2016)

15–19 August 2016, Oxford University, United Kingdom

Accepted papers received: 16 May 2017

Published online: 14 June 2017

Preface

011001

OPEN ACCESS

[X-Ray Microscopy Conference 2016 \(XRM 2016\)](#)

011002

OPEN ACCESS

[Peer review statement](#)

Bio-imaging, Multi-modal imaging, Environmental and geo sciences

012001

OPEN ACCESS

[Phase-contrast tomography of sciatic nerves: image quality and experimental parameters](#)

M Töpperwien, M Krenkel, T Ruhwedel, W Möbius, A Pacureanu, P Cloetens and T Salditt.....1

012002

OPEN ACCESS

[X-ray micro computed tomography for the visualization of an atherosclerotic human coronary artery](#)

Sofiya Matviyuk, Marzia Buscema, Hans Deyhle, Thomas Pfohl, Andreas Zumbuehl, Till Sacher and Bert Müller.....6

012003

OPEN ACCESS

[Quantitative study of mammalian cells by scanning transmission soft X-ray microscopy](#)

K Shinohara, T Ohigashi, S Toné, M Kado and A Ito.....10

012004

OPEN ACCESS

[Imaging samples larger than the field of view: the SLS experience](#)

Ioannis Vogiatzis Oikonomidis, Goran Lovric, Tiziana P Cremona, Filippo Arcadu, Alessandra Patera, Johannes C Schittny and Marco Stampanoni.....14

012005

OPEN ACCESS

[Determination of carbon-to-nitrogen ratio in the filamentous and heterocystous cyanobacterium *Anabaena* sp. PCC 7120 with single-cell soft X-ray imaging](#)

T Teramoto, M Yoshimura, C Azai, K Terauchi and T Ohta.....18

012006

OPEN ACCESS

[Effective segmentation of fresh post-mortem murine lung parenchyma in phase contrast X-ray tomographic microscopy images](#)

Ioannis Vogiatzis Oikonomidis, Tiziana P Cremona, Goran Lovric, Filippo Arcadu, Marco Stampanoni and Johannes C Schittny.....22

012007

OPEN ACCESS

[Scanning Transmission X-ray Microscopy with X-ray Fluorescence Detection at the XUV Beamline P04, PETRA III, DESY](#)

K Andrianov, L Lühl, T Nisius, A Haidl, R Gnewkow, L Lötgering, H Dierks, B Kanngießer and T Wilhein.....26

012008

OPEN ACCESS

[Combined use of X-ray fluorescence microscopy, phase contrast imaging for high resolution quantitative iron mapping in inflamed cells](#)

C Gramaccioni, A Procopio, G Farruggia, E Malucelli, S Iotti, A Notargiacomo, M Fratini, Y Yang, A Pacureanu, P Cloetens, S Bohic, L Massimi, A Cutone, P Valenti, L Rosa, F Berlutti and S Lagomarsino.....30

012009

OPEN ACCESS

[Organelle Distribution in a Hydrated Bio-cell by Correlation between Soft X-ray and Fluorescence Images](#)

T. Ejima, M. Kado, M. Aoyama, K. Yasuda and S. Tamotsu.....34

012010

OPEN ACCESS

[Application of soft X-ray microscopy to environmental microbiology of hydrosphere](#)

K Takemoto, M Yoshimura, T Ohigashi, Y Inagaki, H Namba and H Kihara.....39

012011

OPEN ACCESS

[Synchrotron X-ray microscopy of marine calcifiers: how plankton record past climate change](#)

S A T Redfern, O Branson and E Read.....43

012012

OPEN ACCESS

[Phantom creation and analysis: Improving X-Ray microtomography scanning of soft sediment cores containing volcanic ash](#)

E E Evans, S M Davies and R E Johnston.....50

Elemental contrast and chemistry, Energy and Materials

012013

OPEN ACCESS

[3D elemental mapping of materials and structures by laboratory scale spectroscopic X-ray tomography](#)

C K Egan, S D M Jacques, M D Wilson, M C Veale, P Seller, R A D Pattrick, P J Withers and R J Cernik.....54

012014

OPEN ACCESS

[Simultaneous surface and bulk sensitive XAS measurements of magnetic particle clusters](#)

S Swaraj, P M Dietrich and W E S Unger.....58

012015

OPEN ACCESS

[Chemical state mapping of heterogeneous reduction of iron ore sinter](#)

M. Kimura, Y. Takeichi, R. Murao, I. Obayashi, Y. Hiraoka and Y. Liu.....62

012016

OPEN ACCESS

[In-operando studies of Ag-TCNQ nanocrystals using Raman and soft x-ray microspectroscopy](#)

Benedikt Rösner, Ute Schmidt and Rainer H. Fink.....66

012017

OPEN ACCESS

[X-ray attenuation properties of commonly employed solid oxide fuel cell materials](#)

T M M Heenan, D J L Brett and P R Shearing.....70

012018

OPEN ACCESS

[Understanding transport phenomena in electrochemical energy devices via X-ray nano CT](#)

B Tjaden, J Lane, D J L Brett and P R Shearing.....74

012019

OPEN ACCESS

[Electronic structure of polycrystalline CVD-graphene revealed by Nano-ARPES](#)

Chaoyu Chen, José Avila and Maria C. Asensio.....79

012020
OPEN ACCESS
[Study of the tortuosity factors at multi-scale for a novel-structured SOFC anode](#)
X Lu, T Li, O O Taiwo, J Bailey, T Heenan, K Li, D J L Brett and P R Shearing.....83

012021
OPEN ACCESS
[Simultaneous heating and compression of irradiated graphite during synchrotron microtomographic imaging](#)

A J Bodey, Z Mileeva, T Lowe, E Williamson-Brown, D S Eastwood, C Simpson, V Titarenko, A N Jones, C Rau and P M Mummary.....87

012022
OPEN ACCESS
[In-situ X-ray nano-CT System for Polymer Electrolyte Fuel Cells under Operating Conditions](#)

O Sekizawa, T Uruga, N Ishiguro, H Matsui, K Higashi, T Sakata, Y Iwasawa and M Tada....90

012023
OPEN ACCESS
[Observation of the Interface between Resin and Carbon Fiber by Scanning Transmission X-ray Microscopy](#)

T. Harano, R. Murao, Y. Takeichi, M. Kimura and Y. Takahashi.....94

Diffraction imaging

012024
OPEN ACCESS
[Characterisation of speckle-based X-ray phase-contrast imaging](#)

M Zdora, P Thibault, C Rau and I Zanette.....98

012025
OPEN ACCESS
[Near-Field Diffraction Imaging from Multiple Detection Planes](#)

L Loetgering, M Golembusch, R Hammoud and T Wilhein.....102

012026

OPEN ACCESS

[Multimodal imaging of the human knee down to the cellular level](#)

G. Schulz, C Götz, M. Müller-Gerbl, I. Zanette, M.-C. Zdora, A. Khimchenko, H. Deyhle, P. Thalmann and B. Müller.....106

012027

OPEN ACCESS

[High-dynamic-range water window ptychography](#)

Max Rose, Dmitry Dzhigaev, Tobias Senkbeil, Andreas R. von Gundlach, Susan Stuhr, Christoph Rumancev, Ilya Besedin, Petr Skopintsev, Jens Viefhaus, Axel Rosenhahn and Ivan A. Vartanyants.....110

012028

OPEN ACCESS

[Ptychographic Imaging of Nano-Materials at the Advanced Light Source with the Nanosurveyor Instrument](#)

David A. Shapiro, Rich Celestre, Peter Denes, Maryam Farmand, John Joseph, A.L.D. Kilcoyne, Stefano Marchesini, Howard Padmore, Singanallur V. Venkatakrishnan, Tony Warwick and Young-Sang Yu.....114

012029

OPEN ACCESS

[Deformation of a bismuth ferrite nanocrystal imaged by coherent X-ray diffraction](#)

Marcus C Newton, Adam Pietraszewski, Anthony Kenny, Ulrich Wagner and Christoph Rau.....119

012030

OPEN ACCESS

[Hard X-ray submicrometer tomography of human brain tissue at Diamond Light Source](#)

A Khimchenko, C Bikis, G Schulz, M-C Zdora, I Zanette, J Vila-Comamala, G Schweighauser, J Hench, S E Hieber, H Deyhle, P Thalmann and B Müller.....123

012031

OPEN ACCESS

[Ptychotomography at DLS Coherence Beamline I13](#)

V.S.C. Kuppili, S. Sala, S. Chalkidis, A.M. Wise, A.D. Parsons, I. Zanette, C. Rau and P. Thibault.....127

012032

OPEN ACCESS

[Ptychographic imaging for the characterization of X-ray free-electron laser beams](#)

S Sala, BJ Daurer, MF Hantke, T Ekeberg, ND Loh, FRNC Maia and P Thibault.....131

012033

OPEN ACCESS

[Low-dose, high-resolution and high-efficiency ptychography at STXM beamline of SSRF](#)

Zijian Xu, Chunpeng Wang, Haigang Liu, Xulei Tao and Renzhong Tai.....135

012034

OPEN ACCESS

[Quantitative Evaluation of Hard X-ray Damage to Biological Samples using EUV Ptychography](#)

Peter Baksh, Michal Odstrcil, Aaron Parsons, Jo Bailey, Katrin Deinhardt, John E. Chad, William S. Brocklesby and Jeremy G. Frey.....139

012035

OPEN ACCESS

[Comparison of laboratory grating-based and speckle-tracking x-ray phase-contrast imaging](#)

J. Romell, T. Zhou, M. Zdora, S. Sala, F.J. Koch, H.M. Hertz and A. Burvall.....143

012036

OPEN ACCESS

[An improved acquisition scheme for the reverse projection method](#)

C Wei, Z Wu, F Wali, R Luo and Y Tian.....147

New sources and facilities, Novel techniques & applications, Optics, detectors and instrumentation, Data processing

012037

OPEN ACCESS

[The tomography beamline ANATOMIX at Synchrotron SOLEIL](#)

T Weitkamp, M Scheel, JL Giorgetta, V Joyet, V Le Roux, G Cauchon, T Moreno, F Polack, A Thompson and JP Samama.....151

012038

OPEN ACCESS

[Launch of the I13-2 data beamline at the Diamond Light Source synchrotron](#)

A J Bodey and C Rau.....155

012039

OPEN ACCESS

[Optimal focusing system of the Fresnel zone plates at the Synchrotron SOLEIL NanoARPES beamline](#)

José Avila, Antoine Boury, Borja Caja-Muñoz, Chaoyu Chen, Stephane Lorcy and Maria C. Asensio.....159

012040

OPEN ACCESS

[Simple and robust synchrotron and laboratory solutions for high-resolution multimodal X-ray phase-based imaging](#)

M. Endrizzi, F.A. Vittoria, P.C. Diemoz, G.K. Kallon, D. Basta, A. Zamir, C.K. Hagen, U. H. Wagner, C. Rau, I.K. Robinson and A. Olivo.....163

012041

OPEN ACCESS

[Super-resolution x-ray imaging using interaction between periodic structure of object and standing wave generated with total-reflection-mirror interferometer](#)

Yoshio Suzuki.....169

012042

OPEN ACCESS

[Estimating the resolution of real images](#)

R Mizutani, R Saiga, S Takekoshi, C Inomoto, N Nakamura, M Arai, K Oshima, M Itokawa, A Takeuchi, K Uesugi, Y Terada and Y Suzuki.....173

012043

OPEN ACCESS

[Synchrotron X-ray micro-tomography at the Advanced Light Source: Developments in high-temperature in-situ mechanical testing](#)

Harold S. Barnard, A.A. MacDowell, D.Y. Parkinson, P. Mandal, M. Czabaj, Y. Gao, E. Maillet, B. Blank, N.M. Larson, R.O. Ritchie, B. Gludovatz, C. Acevedo and D. Liu.....177

012044

OPEN ACCESS

[Investigation of Measurement Condition for 3-Dimensional Spectroscopy by Scanning Transmission X-ray Microscopy](#)

T. Ohigashi, Y. Inagaki, A. Ito, K. Shinohara and N. Kosugi.....183

012045

OPEN ACCESS

[Low background, UHV compatible scintillator detector for the CLS cryo scanning soft X-ray microscope](#)

A F G Leontowich, D M Taylor, J Wang, C N Regier, T Z Regier, R Berg, D Beauregard, J J Dynes, C Senger, J Swirsky, C Karunakaran, A P Hitchcock and S G Urquhart.....187

012046

OPEN ACCESS

[Performance of the HERMES beamline at the carbon K-edge](#)

S Swaraj, R Belkhou, S Stanesco, M Rioult, A Besson and A P Hitchcock.....191

012047

OPEN ACCESS

[Nanosurveyor 2: A Compact Instrument for Nano-Tomography at the Advanced Light Source](#)

Richard Celestre, Kasra Nowrouzi, David A. Shapiro, Peter Denes, John M. Joseph, Andreas Schmid and Howard A. Padmore.....195

012048

OPEN ACCESS

[Coherence Length and Vibrations of the Coherence Beamline I13 at the Diamond Light Source](#)

U.H. Wagner, A. Parson and C. Rau.....199

012049

OPEN ACCESS

[Preparing for hard x-ray microscopy with Multilayer Zone Plates](#)

Markus Osterhoff, Christian Eberl, Jakob Soltau and Hans-Ulrich Krebs.....203

012050

OPEN ACCESS

[Nanoscale imaging applications of soft X-ray microscope based on a gas-puff target source](#)

P. W. Wachulak, A. Torrisi, A. Bartnik, L. Wegrzynski, T. Fok and H. Fiedorowicz.....207

012051

OPEN ACCESS

[Introducing high efficiency image detector to X-ray imaging tomography](#)

Kentaro Uesugi, Masato Hoshino and Akihisa Takeuchi.....211

012052

OPEN ACCESS

[Hard X-ray multilayer zone plate with 25-nm outermost zone width](#)

H Takano, K Sumida, H Hirotomo, T Koyama, S Ichimaru, T Ohchi, H Takenaka and Y Kagoshima.....215

012053

OPEN ACCESS

[Circular Unit Cell Gratings for X-ray Dark-Field Imaging](#)

Matias Kagias, Amogha Pandeshwar, Zhentian Wang, Pablo Villanueva-Perez, Konstantins Jefimovs and Marco Stampanoni.....219

012054

OPEN ACCESS

[Current status of X-ray phase imaging at SPring-8: Toward 4D X-ray phase tomography for biological samples](#)

Masato Hoshino, Kentaro Uesugi and Naoto Yagi.....223

012055

OPEN ACCESS

[Improvement of quantitative performance of imaging x-ray microscope by reduction of edge-enhancement effect](#)

A Takeuchi, K Uesugi and Y Suzuki.....227

012056

OPEN ACCESS

[Nanotomography endstation at the P05 beamline: Status and perspectives](#)

I Greving, M Ogurreck, F Marschall, A Last, F Wilde, T Dose, H Burmester, L Lottermoser, M Müller, C David and F Beckmann.....231

012057

OPEN ACCESS

[CARNAÚBA: The Coherent X-Ray Nanoprobe Beamline for the Brazilian Synchrotron SIRIUS/LNLS](#)

Hélio C. N. Tolentino, Márcio M. Soares, Carlos A. Perez, Flávio C. Vicentin, Dalton B. Abdala, Douglas Galante, Verônica de C. Teixeira, Douglas H. C. de Araújo and Harry Westfahl Jr.....235

012058

OPEN ACCESS

[Design and Fabrication of Wolter-type 4-mirror system](#)

N Watanabe, S Aoki and N Yamaguchi.....239

012059

OPEN ACCESS

[dada – a web-based 2D detector analysis tool](#)

Markus Osterhoff.....243

012060

OPEN ACCESS

[MMX-I: A data-processing software for multi-modal X-ray imaging and tomography](#)

A Bergamaschi, K Medjoubi, C Messaoudi, S Marco and A Somogyi.....248