2024 FCMN Technical Program

Monday, April 15

Tutorials

2:00 PM – 4:00 PM

**Machine Learning and Its Application to Metrology**

Dragan Djurdjanovic (UT Austin)

**Metrology Techniques**

Alain Diebold (Univ. of Albany) and Paul van der Heide (Imec)

4:30 – 6:30 PM

**Advanced Packaging**

Ofer Adan (Applied Materials)

Reception and Registration

7:00 – 9:00 PM

Monterey Marriott

Tuesday, April 16

Registration

7:00 AM – 8:30 AM

Conference Opening

9:00 AM

Conference Opening

J. Alexander Liddle, NIST, Conference Co-Chair
Plenary

Session Chairs: J. Alexander Liddle (NIST) and Alain Diebold (Univ. of Albany)

9:15 AM

Rick Gottscho, LAM Research, Big Data, Little Data, and Virtual Twins: Accelerating Process Development for Semiconductor Device Fabrication

10:00 AM

Coffee Break and Poster/Exhibit Viewing

10:30 AM

Arie den Boef, ASML, Metrology Initiatives at ASML and ARC NL

Emerging Materials and Devices

Session Chairs: Ajey Jacob (Univ. of Southern CA), Usha Varshney (NSF), and Christina Hacker (NIST)

11:15 AM

Xiaoqin (Elaine) Li, University of Texas-Austin, Ultrafast Spectroscopy of/for Nanoelectronics

11:45 AM

Daniel Schmidt, IBM, In-Line Metrology for Sub-2nm Technology Nodes

12:15 PM – 1:45 PM

Lunch and Poster/Exhibit Viewing

CHIPS Act & Industry Trends

Session Chairs: Paul van der Heide (Imec) and Markus Kuhn (Rigaku)

1:45 PM

Marla Dowell, National Institute of Standards and Technology, Advancing Measurement Science for Microelectronics: CHIPS R&D Metrology Program

2:15 PM

Zhenxin Zhong, TFS, Latest Developments of Automated TEM Metrology and Analysis for Semiconductor Industry

2:45 PM

Colin Ophus, Berkeley, Applications of Machine Learning to STEM and 4DSTEM Characterization

3:15 PM

Coffee Break and Poster/Exhibit Viewing

Microscopies: New Developments in Chemical/Property Characterization

Session Chairs: Markus Kuhn (Rigaku) and Paul van der Heide (Imec)

3:45 PM
Rudolf Haindl, Max Planck Institute, Coulomb-correlated Electrons in a Transmission Electron Microscope

4:15 PM

Umberto Celano, ASU, Scanning Probe Microscopy: Pushing the Boundaries with Multi-Probes and Reverse Tip Sample Scanning

4:45 PM

Kazuhiko Omote, Rigaku, X-ray Metrology for Characterizing Advanced Nanoelectronics Structure

5:15 – 6:15 PM

Poster Session (with Drinks and Hors d’oeuvres)

7:00 PM

Banquet at Hotel

---

Wednesday, April 17

Registration

7:45 AM – 8:30 AM

Advanced Packaging

Session Chairs: Ehrenfried Zschech (Brandenburg University of Technology Cottbus – Senftenberg, Institute of Physics) and Baohua Niu (Intel)

8:30 AM

Yan Li, Samsung, Fault Isolation Approaches for 3D IC Systems

9:00 AM

Matthew Andrew, ZEISS Innovation Center, Advances in the Use of AI for X-ray Reconstruction: Applications in Electronics Packaging

9:30 AM

Pooya Tadayon, Intel, Title TBD

10:00 AM

Coffee Break and Poster/Exhibit Viewing

New Developments in Chemical/Electrical Characterization

Session Chairs: Paul van der Heide (Imec) and Shinichi Ogawa (AIST)

10:30 AM

Claudia Fleischmann, Imec, Advances in APT Quantification and Distortion Correction Approaches

11:00 AM

Kento Sasaki, Univ. of Tokyo, Arrangement of Nanosized hBN Quantum Sensor Spots by Helium Ion Microscope
11:30 – 1:00 PM
Lunch and Poster/Exhibit Viewing

**Patterning Metrology**
Session Chairs: Ofer Adan (Applied Materials), Alan Brodie (KLA-Tencor), and Shunsuke Koshihara (Hitachi High-Tech Corporation)

1:00 PM
**Jonghyeok Park**, Samsung Electronics, Wide-area Delayering Based 3D Tomography Solution as a Window into the Semiconductor Manufacturing

1:30 PM
**Eugen Foca**, *Carl Zeiss SMT GmbH*, 3D Metrology and Inspection of Advanced NAND and DRAM Devices Via Full 3D Characterization with FIB-SEM Tomography

2:00 PM
**Matt Hettermann**, *EUVTech*, Measuring the Complex Behavior of Phase in the EUV Regime and Implications for Phase Shift Masks

2:30 PM
Coffee Break and Poster/Exhibit Viewing

**Advanced Manufacturing Metrology – Defects**
Session Chairs: Tuyen Tran (Intel), Ye Feng (Intel), and Steve Consiglio (TEL Technology Center)

3:00 PM
**Byoungho Lee**, *Hitachi High-Tech Corporation*, MI(Metrology&Inspection)’s Deliverable Solutions for Next Journey

3:30 PM
**Shay Wolfling**, *Nova*, Advanced and Future Logic Device Architectures: Challenges and Solutions in Materials Metrology

4:00 PM
**Hamed Sadeghian**, Nearfield Instrument, Revolutionizing EUV Lithography Metrology for Sub-3nm Nodes: Validation of a Novel AFM System for Precise 3D Characterization in HVM

4:30 – 6:00 PM
Poster Session (with Drinks and Hors d’oeuvres)

---

**Thursday, April 18**

**Registration**
8:00 AM – 8:30 PM

**Plenary**
Session Chairs: J. Alexander Liddle (NIST) and Alain Diebold (Univ. of Albany)
8:30 AM


**EUV and Advanced Patterning**

Session Chairs: Alain Diebold (Univ. of Albany), Christina Hacker (NIST), Jin Zhang (Lam Research)

9:15 AM

**Nigel Smith, Nanometrics, New Directions for Optical Critical Dimension Metrology**

9:45 AM

**Christina Porter, ASML, Soft X-Ray Scatterometry for 3D CD Metrology on Individual GAA Nanosheets**

10:15 AM

Coffee Break and Post3er/Exhibit Viewing

10:45 AM

**Guillaume Freychet, CEA Leti, Overview Of Critical Dimension Small Angle X-ray Scattering (CD-SAXS) Tomographies: New Developments in 3D Analysis**

Session Chairs: Frank de Jong (Thermo Fisher) and Ehrenfried Zschech (Brandenburg University of Technology Cottbus – Senftenberg, Institute of Physics)

11:15 AM

**Michael Reisinger, KAI GmbH, Understanding the Damage and Microstructural Evolution in Cu Metallizations During Thermomechanical-Fatigue**

11:45 AM

**Nicolas Gauquelin, Univ. Antwerp EMAT, Advances in 3D Tomography and 4DSTEM: Perspectives to Study Semiconductor Devices**

12:15 – 1:45 PM

Lunch and Poster/Exhibit Viewing

1:45 PM

**Tony Levi, Univ. of Southern California, Chip Scan: 3D X-ray Imaging of CMOS Circuits**

2:15 PM

**Eric Van Cappellen, Thermo Fisher Scientific, Integrating Atom Probe Tomography and Transmission Electron Microscopy into a Single Instrument**

**Spintronics-Based Devices**

Session Chair: Jean-Paul Barnes (CEA-Leti)

2:45 PM

**Amanda Petford-Long, Argonne National Lab, Advanced Electron Microscopy Based Metrology Approaches**

3:15 PM
Coffee Break and Poster/Exhibit Viewing

3:45 PM

**Rafal Dunin-Borkowski, Ernst Ruska Centre for Microscopy and Spectroscopy with Electrons**, Characterization of Magnetic Textures in Materials for Spintronics-based Devices

4:15 PM

**Siamak Salimy, Hprobe, MRAM End of Line Magnetic Testing: From Single Bit Properties to Full Memory Qualification**

4:45 PM

Conference End
Lixia Rong, Hao-Ling Tang, Luc Thomas, Hanson Kwok, Michael Phillips, Hongwen Zhou, Qinyi Fu, Lavinia E. Nistor, Jaesoo Ahn, and Mahendra Pakala
Applied Materials, Inc., 3050 Bowers Avenue, Santa Clara, CA

002, Complementary Field-Effect Transistors (CFET): Metrology Challenges and Solutions
J. Bogdanowicz¹, A.-L. Charley¹, M. Saïb¹, M. Beggiato¹, G. Lorusso¹, V. Brissonneau¹, E. Dupuy¹, R. Loo¹, Y. Shimura¹, A. Akula¹, H. Arimura¹, BT Chan¹, D. Zhou¹, N. Horiguchi¹, S. Biesmans¹, P. Leray¹, J. Hung², I. Turovets², S. Wei³, P. Hönicke⁴, and R. Ciesielski⁴
¹imec, Kapeldreef 75, 3001 Leuven, Belgium
²Nova Ltd., 5 David Fikes St., Rehovot 7632805, Israel
³Hitachi High-Tech Corp., 552-53, Shinkocho, Hitachinaka-shi, Ibaraki, Japan
⁴Physikalisch-Technische Bundesanstalt (PTB), Abbestr. 2-12, 10587 Berlin, Germany
⁵Ghent University, Department of Solid-State Sciences, Krijgslaan 281, building S1, 9000 Ghent, Belgium

003, Asymmetry of Junction Line Defect Distribution in WS₂-WSe₂ Lateral / Vertical Hetero-structures Revealed by TERS Imaging
Andrey Krayev¹, A. Edward Robinson¹, Peng Chen², Xidong Duan³, Zhengwei Zhang³, and Xiangfeng Duan⁴
¹HORIBA Scientific, 359 Bel Marin Keys Blvd, Novato, CA94949, USA
²Southern University of Science and Technology, Shenzhen, China
³Department of Applied Chemistry, Hunan University, China
⁴Department of Chemistry and Biochemistry, University of California, Los Angeles, USA

004, Atom Probe Tomography Using an Extreme Ultraviolet Pulsed Light Source
Luis Miaja-Avila, Benjamin W. Caplins, Jacob M. Garcia, Ann N. Chiaramonti, and Norman A. Sanford
National Institute of Standards and Technology, Boulder, CO, USA

005, Merging Integrated Photonics and Electron Beams: μE-V Electron-Spectroscopy and Single-Particle Heralding
A. Feist¹,², G. Huang³,⁴, G. Arend¹,², Y. Yang³,⁴, J.-W. Henke¹,², A. S. Raja³,⁴, F. J. Kappert¹,², R. N. Wang³,⁴, H. Lourenço-Martins¹,², Z. Qiu³,⁴, J. Liu³,⁴, O. Khir¹,², T. J. Kippenberg³,⁴, and C. Ropers¹,²
¹Department for Ultrafast Dynamics, Max Planck Institute of Multidisciplinary Sciences, Göttingen, DE
²IV. Physical Institute – Solids and Nanostructures, University of Göttingen, Göttingen, DE
³Institute of Physics, Swiss Federal Institute of Technology Lausanne, Lausanne, CH
⁴Center for Quantum Science and Engineering, EPFL, Lausanne, CH

006, Characterization of 2D Transition Metal Dichalcogenide Layers by Combined TOF-SIMS and in-situ AFM
Rita Tilmann¹, Stefan Heiserer², Valentina Spampinato¹,³, Yuanyuan Shi¹,², Jill Serron¹, Albert Minj¹, Benjamin Groven¹, Georg S. Duesberg², Thomas Hantschel¹, Paul A.W. van der Heide¹, and Alexis Franquet¹
¹IMEC, Kapeldreef 75, 3001 Leuven, Belgium
²University of the Bundeswehr Munich & Center for Integrated Sensor Systems (SENS), Institute of Physics, EIT2, Neubiberg, Germany
³Università degli Studi di Catania, Dipartimento di Scienze Chimiche, Viale A. Doria 6, Catania, Italy
⁴School of Microelectronics, University of Science and Technology of China, Hefei, China

007, Hard X-ray Photoelectron Spectroscopy (HAXPES) in Material Development
T. Sloboda¹, S. Eriksson¹, M. Lundwall¹, P. Amann¹,², M. Masatake³, B. Krömker², T. Wiell¹, B. Gerace⁴, A.
008, Analysis of Alternative Dopants for Organic Light-Emitting Diodes Layers Using a Correlative TOF-SIMS & XPS Protocol
C. Guyot, J.P. Barnes, O. Renault, and T. Maindron
Univ. Grenoble Alpes, CEA, Leti, F-38000 Grenoble, France

009, Spatially Resolved Chemical Metrology on EUV Resist
Komal Pandey¹, Quentin Evrard², Albert M. Brouwer³, C.B. Chuang¹, Maarten van Es¹, and Diederik J. Maas¹
¹TNO, Stieltjesweg 1, 2628CK, Delft, The Netherlands
²University of Amsterdam, Science Park 904, 1090 GD Amsterdam, The Netherlands

010, Development of a Double Mirror CC-Cs-corrector for Low-Voltage SEM
Diederik Maas¹², Maurice Krielaart¹, Léon van Velzen¹, and Pieter Kriut¹
¹Delft University of Technology, Applied Sciences, Lorentzweg 1, Delft, 2628 CJ, The Netherlands,
²Netherlands organisation of Applied Science (TNO), Stieltjesweg 1, Delft, 2628 CK, The Netherlands

011, The Interface Study of Photoresist/Underlayer Using Hybrid R-ray Reflectivity and X-ray Standing Wave Approach
Atul Tiwari¹, Roberto Fallica², Marcelo D. Ackermann¹, and Igor A. Makhotkin¹
¹Industrial Focus Group XUV Optics, MESA+ Institute for Nanotechnology, University of Twente,
Drienerlolaan 5, 7522 NB Enschede, The Netherlands
²IMEC, Kapeldreef 75, 3001 Leuven, Belgium

012, Paradigm Shift: Conical Frustum Arrays for Electron-Beam Goniometry
A. C. Madison¹, K. A. Cochrane², J. S. Villarrubia¹, D. A. Westly¹, R. G. Dixon¹, C. R. Copeland¹, J. D. Gerling³, A. D. Brodie², J. A. Liddle¹, L. P. Muray³, and S. M. Stavis¹
¹National Institute of Standards and Technology, Gaithersburg, Maryland 20899
²KLA Corporation, Milpitas, California 95035

013, Automation of Precession-Assisted Nanobeam Diffraction and 4D-STEM Measurements for Multimodal Characterization of Semiconductor Devices
Daniel Němeček¹ and Robert Stroud²
¹TESCAN GROUP, Libušina třída 21, 62300 Brno, Czech Republic
²TESCAN GROUP, 765 Commonwealth Dr #101, Warrendale, PA 15086, USA

014, Self Focusing SIMS to Enable Boron Quantification in Small Si and SiGe Structures
Alexis Franquet¹, Valentina Spampinato¹², and Paul A.W. van der Heide¹
¹IMEC, Kapeldreef 75, 3001 Leuven, Belgium
²Università degli Studi di Catania, Dipartimento di Scienze Chimiche, Viale A. Doria 6, 95125 Catania, Italy

015, Etching Monitoring of Advanced Forksheet Devices Using AKONIS SIMS Tool
A-S. Robbes¹, O. Dulac¹, K. Soulard¹, M. Adier¹, S. Choi¹, D. Jacobson², A. Merkulov³, R. Tilmann³, P.A.W. van der Heide³, and A. Franquet³
¹CAMECA, 29 quai des grésillons 92622 Gennevilliers Cedex
016, In-situ and Ex-situ Diagnostics for Ion Measurement and Control for RF-driven Plasma Tools
A. Verma¹, T. Gilmore¹, and D. Simpson²
¹Impedans Ltd, Chase House, City Junction Business Park, Northern Cross, Dublin, D17 AK63, Ireland
²Centre for Light Matter Interactions, School of Mathematics and Physics, Queen’s University Belfast, UK

017, Improving Self-Focusing SIMS On Hybrid SIMS Instruments – Instrumental Aspects and Method Development
T. Greihl¹, S. Kayser¹, J. Zakel¹, D. Rading¹, A. Pirkl¹, H. Arlinghaus¹, V. Spampinato²,³, and A. Franquet²
¹IONTOF GmbH, 48149 Muenster, Germany
²MCA, IMEC, Kapeldreef 75, 3001 Leuven, Belgium
³Università degli Studi di Catania, Dipartimento di Scienze Chimiche, Viale A. Doria 6, 95125 Catania, Italy

018, Towards a Better Understanding of GaN Based HEMT Electrical Response Thanks to XPS, nano-Auger and STEM-EDX Multi-technique Approach
K. Gaffar¹, S. Béchu¹, G. Patriarche², and M. Bouttemy¹
¹Institut Lavoisier de Versailles, UVSQ, Université Paris-Saclay, CNRS, UMR 8180, 45 avenue des Etats-Unis, 78035 Versailles CEDEX, France
²C2N, Université Paris-Saclay, CNRS, Palaiseau, France

019, EBIC Mapping of Threshold Voltage Distribution During Device Turn-on in SiC MOSFETs
Greg M. Johnson¹, Andreas Rummel², and Heiko Stegmann³
¹Carl Zeiss Microscopy, Dublin, CA
²Kliendiek Nanotechnik, Reutlingen, Germany
³Carl Zeiss Microscopy GmbH, Munich, Germany

020, Coming of Age of Computational SEM
Benjamin D. Bunday, Shari Klotzkin, Douglas Patriarche, and Yvette Ball
AMAG nanometro, Schenectady, NY, 12303, USA

021, Effective Pupil Apodization in Digital Holographic Microscopy
T. Cromwijk¹,², M. Noordam¹,², S. Witte¹,², J. F. de Boer³, A. den Boef³
¹Department of Physics and Astronomy, and LaserLaB, Vrije Universiteit, The Netherlands
²Advanced Research Center for Nanolithography (ARCNL), The Netherlands
³ASML Netherlands B.V., The Netherlands

022, Polarization Sensitive Digital Holographic Microscopy
M. L. Noordam¹,², T. Cromwijk¹,², J. F. de Boer², and A. J. den Boef¹,²,³
¹Advanced Research Center for Nanolithography (ARCNL), Science Park 106, 1098 XG Amsterdam, The Netherlands
²Department of Physics and Astronomy, and LaserLaB, Vrije Universiteit, De Boelelaan 1081, 1081 HV Amsterdam, The Netherlands
³ASML Netherlands B.V., De Run 6501, 5504 DR Veldhoven, The Netherlands

023, Combining In-Line Atomic Force Microscopy and Scatterometry for Metrology of 3D Holographic Patterns in Roll-to-Roll Nanoscale Manufacturing
Barbara Groh¹, Kwon Sang Lee¹, Shashank Venkatesan², Luis Arturo Aguirre¹, Sofia Frey¹, Liam G. Connolly³, Michael Baldea², Chih-Hao Chang¹, and Michael Cullinan¹
¹Walker Department of Mechanical Engineering, University of Texas at Austin
²McKetta Department of Chemical Engineering, University of Texas at Austin
024, Dark Uncertainty in Hybrid Metrology for Semiconductor Manufacturing
Ronald G. Dixson, Adam L. Pintar, R. Joseph Kline, Thomas A. Germer, John S. Villarrubia, and Samuel M. Stavis
National Institute of Standards and Technology, Gaithersburg, Maryland 20899

025, GaN/InGaN µLEDs Study by Cathodoluminescence and Photo-Sensitive Kelvin Probe Force Microscopy
Palmerina González-Izquierdo, Névine Rochat, Davide Zoccarato, Fabian Rol, Julia Simon, Patrick Le Maitre, Marion Volpert, Matthew Charles, Matthieu Lafossas, Simona Torrengo, Narciso Gambacorti, and Łukasz Borowik
Univ. Grenoble Alpes, CEA, Leti, F-38000 Grenoble, France

026, 3D Corner Residue Monitoring for CFET Gate Patterning Using CD-SEM
Wei Sun¹, Emmanuel Dupuy², Il Gyo Koo², BT Chan², Gian Lorusso², Janusz Bogdanowicz², Anne-Laure Charley², Jef Geypen², Patrick Carolan², Kei Sakai¹, Zhenghan Li¹, and Miki Isawa¹
¹Hitachi High-Tech Corp., 552-53, Shinkocho, Hitachinaka-shi, Ibaraki, Japan
²IMEC, Kapeldreef 75, 3001 Leuven, Belgium

027, Fluorescence-Guided Sub-micron Optical Photothermal Infrared Spectroscopy (O-PTIR) for the Localization and Identification of Defects and Contaminants
Eoghan Dillon and Michael K. F. Lo
Photothermal Spectroscopy Corp. 325 Chapala Street, Santa Barbara, CA, 93101

028, Crystal Orientation Quantification In Less Than 10 Seconds
D. Lopez¹, L.Grieger², M. Van der Haar², and D. Beckers²
¹Malvern Panalytical Inc., 2400 Computer Drive, Westborough, MA, 10581, United States
²Malvern Panalytical B.V., Lelyweg 1, 7600AA Almelo, The Netherlands

029, Instrument Development for Spectroscopic Ellipsometry and Diffractometry in the EUV
S. L. Moffitt¹, B. M. Barnes¹, T. A. Germer¹, S. Grantham¹, E. L. Shirley¹, M. Y. Sohn¹, D. F. Sunday², and C. Tarrio¹
¹Physical Measurement Laboratory, National Institute of Standards and Technology, Gaithersburg, MD, 20899, USA
²Materials Measurement Laboratory, National Institute of Standards and Technology, Gaithersburg, MD, 20899, USA

030, Defect Localization in metallization on Advanced Packages Using Magnetic Imaging
T. Venkatesan¹,², Nesco Lettsome¹, Jeet Patel¹, Solomon Saul¹, Fred Cawthorne¹, Fred Wellstood¹, Steve Garrahan¹, and Henri Lezec³
¹Neocera Magma LLC, 10000 Virginia Manor Road, Beltsville MD 20705
²CQRT, Department of Physics and Astronomy, University of Oklahoma, Norman OK 73019
³NIST Gaithersburg, 100 Bureau Dr., Gaithersburg, MD 20899

031, DUV-Vis-NIR OCD Metrology for BCD Semiconductor Manufacturing Yield Enhancements
Jeffrey W. Roberts¹, John C. Lam¹, Nikolaos Palilikarakis¹, Kostas Florios¹, Marco Colli², Matteo Lombardo², and Marcello Ravasio²
¹n&k Technology San Jose, CA, USA
²STMicroelectronics Agrate Brianza MB, Italy
032, Nanoscale 3D X-Ray Imaging of Integrated Circuits using a Hybrid Electron/X-Ray Microscope
Nathan Nakamura1,2, Joseph W. Fowler1,2, Zachary H. Levine3, Paul Szypryt1,2, and Daniel S. Swetz1
1National Institute of Standards and Technology, Boulder, Colorado 80305, USA
2Department of Physics, University of Colorado, Boulder, Colorado 80309, USA
3National Institute of Standards and Technology, Gaithersburg, Maryland 20899, USA

033, Pushing the Speed and Resolution Limits of 3D X-ray for In-Line Metrology in Wafer Level
Integration and Offline Defect Characterization
S.H. Lau, Sheraz Gul, Jeff Gelb, Tianzhu Qin, Sylvia Lewis, and Wenbing Yun
Sigray Inc, 1590 Solano Way, Suite A, Concord, CA 94520

034, Dopant and Thin Film Metrology using Laboratory-Based Micro-XRF in the Low Z and Low Energy
Range
Benjamin Stripe, Frances Y. Su, Michael Lun, Tinchi Leung, Ian Spink, Sylvia Lewis, and Wenbing Yun
Sigray, Inc., 1590 Solano Way, Suite A, Concord, CA, United States

035, New Development of X-ray Assisted Device Alteration (XADA) for Circuit Debugging: A Solution
for Backside Power Delivery (BPD)
Sylvia Lewis, Benjamin Stripe, Frances Su, Michael Lun, Quoc Nguyen, Mark Cordier, Stuart Coleman,
S.H. Lau, and Wenbing Yun
Sigray, Inc., 1590 Solano Way, Suite A, Concord CA 94520

036, Solving the Metrology Challenges of High Aspect Ratio Features Using 3D Tomography
Shawn Sallis, Tian Lian, Jin Zhang, Ying Gao, and Osman Sorkhabi
Lam Research Corporation, 4400 Cushing Parkway, Fremont, California 94538

037, Extreme Brightness X-ray Sources for Semiconductor Metrology
Iyer
Excillum AB, Jan Stenbecks Torg 17, 164 40 Kista, Sweden

038, Nanofocus X-ray Source for Improved Resolution in Advanced Packaging Metrology
Excillum AB, Jan Stenbecks Torg 17, 164 40 Kista, Sweden

039, Advancing High-Density 3D NAND TEM Sample Preparation with Ultrafast fs-Laser Milling in FIB-
SEM-Laser Systems
Arun Prabha1 and Cheryl Hartfield2
1Carl Zeiss Pte Ltd 80 Bendemeer Road, #10-01, Singapore 339949
2Carl Zeiss Microscopy, LLC 5300 Central Pkwy, Dublin, CA 94568, United States