

PROCEEDINGS OF SPIE

# ***Advanced Etch Technology for Nanopatterning II***

**Ying Zhang  
Gottlieb S. Oehrlein  
Qinghuang Lin**  
*Editors*

**25–26 February 2013  
San Jose, California, United States**

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*Published by*  
SPIE

**Volume 8685**

Proceedings of SPIE 0277-786X, V.8685

SPIE is an international society advancing an interdisciplinary approach to the science and application of light.

Advanced Etch Technology for Nanopatterning II, edited by Ying Zhang, Gottlieb S. Oehrlein, Qinghuang Lin,  
Proc. of SPIE Vol. 8685, 868501 · © 2013 SPIE · CCC code: 0277-786X/13/\$18  
doi: 10.1117/12.2028903

Proc. of SPIE Vol. 8685 868501-1

The papers included in this volume were part of the technical conference cited on the cover and title page. Papers were selected and subject to review by the editors and conference program committee. Some conference presentations may not be available for publication. The papers published in these proceedings reflect the work and thoughts of the authors and are published herein as submitted. The publisher is not responsible for the validity of the information or for any outcomes resulting from reliance thereon.

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Author(s), "Title of Paper," in *Advanced Etch Technology for Nanopatterning II*, edited by Ying Zhang, Gottlieb S. Oehrlein, Qinghuang Lin, Proceedings of SPIE Vol. 8685 (SPIE, Bellingham, WA, 2013) Article CID Number.

ISSN: 0277-786X

ISBN: 9780819494672

Published by

**SPIE**

P.O. Box 10, Bellingham, Washington 98227-0010 USA

Telephone +1 360 676 3290 (Pacific Time) · Fax +1 360 647 1445

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# Contents

vii	<i>Conference Committee</i>
ix	<i>Introduction</i>

---

## SESSION 1 LITHO AND PLASMA ETCHING INTERACTION

---

- 8685 03 **Extension of patterning technologies down to sub-10nm half pitch (Invited Paper)** [8685-2]  
S. Mimotogi, Toshiba Materials Co., Ltd. (Japan)
- 8685 04 **Etch correction and OPC: a look at the current state and future of etch correction (Invited Paper)** [8685-3]  
I. Stobert, D. Dunn, IBM Corp. (United States)

---

## SESSION 2 PLASMA/RESIST INTERACTION AND LER

---

- 8685 05 **Towards an integrated line edge roughness understanding: metrology, characterization, and plasma etching transfer (Invited Paper)** [8685-4]  
E. Gogolides, V. Constantoudis, G. Kokkoris, National Ctr. for Scientific Research Demokritos (Greece)
- 8685 08 **Line edge and width roughness smoothing by plasma treatment** [8685-7]  
P. De Schepper, T. Hansen, IMEC (Belgium) and Katholieke Univ. Leuven (Belgium);  
E. Altamirano-Sanchez, A. Vaglio Pret, W. Boullart, IMEC (Belgium); S. De Gendt, IMEC (Belgium) and Katholieke Univ. Leuven (Belgium)

---

## SESSION 3 PLASMA ETCHING FOR ADVANCED TECHNOLOGY NODES

---

- 8685 0A **Advanced plasma etch for the 10nm node and beyond (Invited Paper)** [8685-8]  
E. A. Joseph, S. U. Engelmann, H. Miyazoe, R. L. Bruce, IBM Thomas J. Watson Research Ctr. (United States); M. Nakamura, T. Suzuki, Zeon Chemicals L.P. (United States); M. Hoinkis, Applied Materials, Inc. (United States)
- 8685 0B **A new method based on AFM for the study of photoresist sidewall smoothing and LER transfer during gate patterning (Invited Paper)** [8685-9]  
M. Fouchier, E. Pargon, B. Bardet, CEA LTM, CNRS, Univ. Joseph Fourier - Grenoble I (France)
- 8685 0C **15nm HP patterning with EUV and SADP: key contributors for improvement of LWR, LER, and CDU** [8685-10]  
K. Xu, L. Souriau, IMEC (Belgium); D. Hellin, Lam Research Corp. (Belgium); J. Versluijs, P. Wong, D. Vangoidsenhoven, N. Vandenbroeck, H. Dekkers, X. P. Shi, J. Albert, C. L. Tan, IMEC (Belgium); J. Vertommen, B. Coenegrachts, Lam Research Corp. (Belgium); I. Orain, Y. Kimura, Lam Research Corp. (United States); V. Wiaux, W. Boullart, IMEC (Belgium)

- 8685 0D **Tall FIN formation for FINFET devices of 20nm and beyond using multi-cycles of passivation and etch processes** [8685-11]  
D. Choi, D. G. Yang, P. Khanna, C. Maeng, O. Hu, H. Shen, A. Wei, S. Kim,  
GLOBALFOUNDRIES Inc. (United States)

---

**SESSION 4 MEMORY PATTERNING**

---

- 8685 0E **Patterning and etch challenges for future DRAM and other high aspect ratio memory device fabrication (Invited Paper)** [8685-12]  
N. R. Rueger, A. McGinnis, F. Good, A. J. Schrinisky, M. Kiehlbauch, Micron Technology, Inc.  
(United States)
- 8685 0F **STT MRAM patterning challenges (Invited Paper)** [8685-13]  
W. Boullart, D. Radisic, IMEC (Belgium); V. Paraschiv, Etch Tech Solutions (Romania);  
S. Cornelissen, M. Manfrini, IMEC (Belgium); K. Yatsuda, Tokyo Electron Ltd. (Japan);  
E. Nishimura, T. Ohishi, S. Tahara, Tokyo Electron Miyagi Ltd. (Japan)

---

**SESSION 5 NEW PLASMA SOURCES AND NEW ETCHING TECHNOLOGIES**

---

- 8685 0H **Properties of RLSA microwave surface wave plasma and its applications to finFET fabrication (Invited Paper)** [8685-15]  
L. Chen, Q. Yang, Tokyo Electron America, Inc. (United States)
- 8685 0J **Characterization of silicon etching in synchronized pulsed plasma** [8685-17]  
M. Darnon, M. Haass, G. Cunge, O. Joubert, CEA LTM, CNRS, Univ. Joseph Fourier -  
Grenoble1 (France); S. Banna, Applied Materials, Inc. (United States)
- 8685 0K **Cut-process overlay yield model for self-aligned multiple patterning and a misalignment correction technique based on dry etching** [8685-18]  
P. Zhang, Y. Chen, Peking Univ. Shenzhen Graduate School (China)

---

**SESSION 6 EMERGING PATTERNING TECHNOLOGY**

---

- 8685 0L **Pattern transfer of directed self-assembly (DSA) patterns for CMOS device applications (Invited Paper)** [8685-19]  
H.-Y. Tsai, H. Miyazoe, S. Engelmann, S. Bangsaruntip, I. Lauer, J. Bucchignano, D. Klaus,  
L. Gignac, E. Joseph, IBM Thomas J. Watson Research Ctr. (United States); J. Cheng,  
D. Sanders, IBM Almaden Research Ctr. (United States); M. Guillorn, IBM Thomas J. Watson  
Research Ctr. (United States)
- 8685 0M **Noble approaches on double-patterning process toward sub-15nm (Invited Paper)**  
[8685-20]  
H. Yaegashi, Tokyo Electron Ltd. (Japan); K. Oyama, A. Hara, S. Natori, S. Yamauchi,  
M. Yamato, Tokyo Electron AT Ltd. (Japan)

## POSTER SESSION

---

- 8685 OP **Double patterning with dual hard mask for 28nm node devices and below** [8685-24]  
H. Hody, V. Paraschiv, E. Vecchio, S. Locorotondo, G. Winroth, R. Athimulam, W. Boullart, IMEC (Belgium)
- 8685 OQ **Spin-on-carbon hardmask based on fullerene derivatives for high-aspect ratio etching** [8685-25]  
A. Frommhold, R. E. Palmer, A. P. G. Robinson, The Univ. of Birmingham (United Kingdom)
- 8685 OR **Evaluating spin-on carbon materials at low temperatures for high wiggling resistance** [8685-26]  
M. Weigand, V. Krishnamurthy, Y. Wang, Q. Lin, D. Guerrero, S. Simmons, B. Carr, Brewer Science, Inc. (United States)
- 8685 OS **Sub-30nm TiN/Ti/HfO<sub>x</sub> pillar formed by tone reverse processes for RRAM applications** [8685-27]  
W.-S. Chen, P.-S. Chen, H. C. Chen, H.-W. Wei, F. T. Chen, T.-K. Ku, Industrial Technology Research Institute (Taiwan)
- 8685 OT **Characteristics of selective PMMA etching for forming a PS mask** [8685-28]  
M. Satake, T. Iwase, M. Kurihara, N. Negishi, Y. Tada, H. Yoshida, Hitachi, Ltd. (Japan)
- 8685 OU **Yield enhancement of 3D flash devices through broadband brightfield inspection of the channel hole process module** [8685-29]  
J.-Y. Lee, I.-S. Seo, S.-M. Ma, H.-S. Kim, J.-W. Kim, SK hynix, Inc. (Korea, Republic of); D. O. Kim, A. Cross, KLA-Tencor Co. (United States)
- 8685 OV **Evaluation of an advanced dual hard mask stack for high resolution pattern transfer** [8685-30]  
J. Paul, M. Rudolph, S. Riedel, X. Thrun, Fraunhofer-Ctr. Nanoelektronische Technologien (Germany); S. Wege, Plasway (Germany); C. Hohle, Fraunhofer-Ctr. Nanoelektronische Technologien (Germany)
- 8685 OW **The importance of lithography and advanced etch techniques for nanofabrication of MOS capacitor with HfO<sub>2</sub>** [8685-31]  
M. A. Belete, The Royal Institute of Technology (Sweden)

*Author Index*

# Conference Committee

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- 1 Litho and Plasma Etching Interaction  
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**Rich Wise**, IBM Corporation (United States)

- 2 Plasma/Resist Interaction and LER  
**Gottlieb S. Oehrlein**, University of Maryland, College Park  
(United States)  
**Maxime Darnon**, LTM CNRS (France)
- 3 Plasma Etching for Advanced Technology Nodes  
**Sebastian U. Engelmann**, IBM Thomas J. Watson Research Center  
(United States)  
**Maxime Darnon**, LTM CNRS (France)
- 4 Memory Patterning  
**Julie Bannister**, Tokyo Electron America, Inc. (United States)
- 5 New Plasma Sources and New Etching Technologies  
**Seiji Samukawa**, Tohoku University (Japan)  
**Ying Zhang**, Taiwan Semiconductor Manufacturing Company Ltd.  
(Taiwan)
- 6 Emerging Patterning Technology  
**Joan Bosworth**, Intel Corporation (United States)  
**Ricardo Ruiz**, HGST (United States)

# Introduction

During the last few decades of tremendous success of the semiconductor industry, plasma etch-based pattern transfer technology has played the key role, along with lithography technology, as the main enabling techniques behind the continuous growth of component density in integrated circuits defined by Moore's Law. Within the new era of mobile devices and other emerging applications, a new pace of a new generation every year instead of every two years has taken place. Semiconductor device shrinkage has shown a trend faster than the pace defined by the Moore's Law. With the delay of EUV Lithography for High Volume Manufacturing (HVM) and optical lithography technologies, such as 193 nm immersion lithography technology, having reached limits for single exposure patterning, a variety of multiple patterning technologies with mixtures of optical lithography and plasma etching, such as Double Patterning and Pitch-Splitting (DP/PS), or Self-aligned Spacer Double Patterning, has emerged. These are rapidly becoming the dominant approaches for 32nm, 22nm, and 14nm technology nodes. Alternative lithography technologies, such as Directed Self-Assembly (DSA), have also quickly attracted more attention and are being considered as possible alternatives for 10nm node and beyond. Pitch shrinking, resist mask layer thickness thinning, Line Edge Roughness (LER), Line Width Roughness (LWR) increasing mask stack complexity and mask material changes, emerging alternative lithographic approaches provide major challenges for plasma etch patterning.

This proceedings volume collects selected papers presented at the second Advanced Etch Technology for Nanopatterning Conference (AETNC II), held February 25-26<sup>th</sup>, 2013 as part of the SPIE Advanced Lithography Symposium 2013. There were 6 sessions in the AETNC II.

- Session 1: Litho and Plasma Etching Interaction
- Session 2: Plasma/Resist Interaction and LER
- Session 3: Plasma Etching for Advanced Technology Nodes
- Session 4: Memory Patterning
- Session 5: New Plasma Sources and New Etching Technologies
- Session 6: Emerging Patterning Technology

We would like to take this opportunity to thank all members of the SPIE 2013 Advanced Lithography Symposium Committee for their help in organizing another very successful SPIE Advanced Etch Technology for Nanopatterning Conference. The dedication, enthusiasm, and efforts of many volunteers, keynote speakers, invited speakers, and authors of contributed papers of AETNC II were essential for the success of the conference. We like to thank everyone, along with members and volunteers of the SPIE community for their support and efforts.

**Ying Zhang  
Gottlieb Oehrlein  
Qinghuang Lin**