SYMPOSIUM ED9

Advanced Interconnects for Logic and Memory Applications—Materials, Processes and Integration
April 18 - April 19, 2017

Symposium Organizers
Mikhail Baklanov, North China University of Technology (NCUT)
Jeffery Bielefeld, Intel Corporation
Vincent Jousseaume, CEA-LETI
Eiichi Kondoh, University of Yamanashi

Symposium Support
Air Liquide
Applied Materials
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Proceedings Statement
All authors are invited to submit articles based on their 2017 MRS Spring Meeting presentations to the journals in the MRS portfolio (www.mrs.org/publications-news). Papers submitted and accepted for publication in MRS Advances (www.mrs.org/mrs-advances) will be available as symposium collections. Visit the MRS/Cambridge University Press Publications Booth #100 in the Exhibit Hall to learn more, including MRS Advances print options available at special rates during the meeting week only.

10:30 AM *ED9.1.01
Boron-Based Solids for Advanced Interconnect Applications Michelle M. Paquette; University of Missouri–Kansas City, United States.

**ED9.1.02**
Material Innovations for Future BEOL Interconnects E. T. Ryan; GLOBALFOUNDRIES, United States.

**ED9.1.03**
Metal-Organo Frameworks as Gap Filling Low-K Dielectric Material in Advanced Interconnects Mikhail Krishtab1, 2; ‘imec, Belgium; ‘KU Leuven, Belgium.

**ED9.1.04**
Silica Aerogel Low-K Films towards Inter Layer Dielectric (ILD) Ashok M. Mahajan; North Maharashtra University, India.

1:30 PM *ED9.2.01
The N3XT 1,000× of Computing Energy Efficiency H. S. Philip Wong; Stanford University, United States.

**ED9.2.02**
Mechanism for Bipolar Resistive Switching in Annealed GO Thin Films Pooja Saini; University of Delhi, India.

2:15 PM *ED9.2.03
Reduction of Interface Trap in Poly-Si Channel for 3D NAND Device through Dielectric Recovery Process Dong Uk Lee; SKhynix Inc., Korea (the Republic of).

2:30 PM BREAK

**SESSION ED9.3: Advanced Integration**
Session Chairs: Eiichi Kondoh and Chen Wu
Tuesday Afternoon, April 18, 2017
PCC North, 100 Level, Room 128 B

3:00 PM *ED9.3.01
Selective Surface Modification for ALD and SAM Deposition Yves J. Chabal; University of Texas at Dallas, United States.

**ED9.3.02**
New Material and Integration Innovations to Enable Advanced Interconnect Scaling Larry Zhao; Lam Research, United States.

4:00 PM **ED9.3.03**
Low Damage ULK Etching by Means of High Boiling Point Organic Condensation Romain Chanson; ‘imec, Belgium.

4:15 PM **ED9.3.04**
Integration of Ultralow-K Dielectrics Using a Template Replacement Approach Liping Zhang1, 2; ‘imec, Belgium; ‘KU Leuven, Belgium.

4:45 PM **ED9.3.05**
Thermal Stability of Low-K Dielectrics for 3D Sequential Integration Sylvain Beaurepaire1, 2, 3; ‘Université Grenoble Alpes, France; ‘CEA LETI MINATEC Campus, France; ‘LTM UGA/CNRS/CEA, France.

4:45 PM **ED9.3.06**
Thermal Stability of Low-K Dielectrics for 3D Sequential Integration Sylvain Beaurepaire1, 2, 3; ‘Université Grenoble Alpes, France; ‘CEA LETI MINATEC Campus, France; ‘LTM UGA/CNRS/CEA, France.

**SESSION ED9.4: Poster Session**
Tuesday Afternoon, April 18, 2017
8:00 PM - 10:00 PM
Sheraton, Third Level, Phoenix Ballroom

**ED9.4.01**
Atomic Layer Deposition of Boron Carbide for Interconnect Applications Lauren M. Dorsett; University of Missouri–Kansas City, United States.

**ED9.4.02**
Plasma Enhanced Chemical Vapor Deposition of Al2O3 Films Using Dimethylaluminum Isopropoxide without Additional Oxygen Sources Wonjin Ban; Sungkyunkwan University, Korea (the Republic of).

**ED9.4.03**
Electrical Properties of Low-K SiCOH Films Deposited with the Phenyltrimethoxysilane Single Precursor Sunyeol Kwon; Sungkyunkwan University, Korea (the Republic of).

**ED9.4.04**

**ED9.4.05**
Effect of Carbon Bridge Content on Spin-On Copolymer PMO Films K. Vorotilov; Moscow Technological University, Russian Federation.
SESSION ED9.5: Integration and Metallization
Session Chairs: Jeffery Bielefeld and Larry Zhao
Wednesday Morning, April 19, 2017
PCC North, 100 Level, Room 128 B

8:00 AM *ED9.5.01
CMP Challenges for Advanced Technology Nodes John H. Zhang; GLOBALFOUNDRIES, United States.

8:30 AM ED9.5.02
Controlling the Microstructure of Electroless Cobalt for Semiconductor Interconnect Applications Kevin Musick1, 2; SUNY Polytechnic Institute, United States; 1University at Albany, State University of New York, United States.

8:45 AM ED9.5.03
Insight into the Molecular Structure of Amino-Copper (II) Formates in Forming High Conductivity Copper Films for Printable Electronics Chantal Paquet; National Research Council of Canada, Canada.

9:00 AM ED9.5.04
Etching of Transition Metals (Co, Ni, Fe, Pt) Using Supercritical Fluids Eiichi Kondoh; University of Yamanashi, Japan.

9:15 AM ED9.5.05
Pore Surface Grafting of Porous Low-K Dielectrics by Selective Polymers Askar Rezvanov1, 2, 3; imec, Belgium; 1Moscow Institute of Physics and Technology, Russian Federation; 2Molecular Electronics Research Institute, Russian Federation.

9:30 AM BREAK

SESSION ED9.6: Novel Processing Methods
Session Chairs: Yves Chabal and Eiichi Kondoh
Wednesday Morning, April 19, 2017
PCC North, 100 Level, Room 128 B

10:00 AM *ED9.6.01
3D Sequential Integration—Opportunities and Challenges in Low Temperature Process Modules Claire Fenouillet-Beranger; CEA/LETI, France.

10:30 AM ED9.6.02
Self-Aligned Growth of 3D Nano-Bridge-Based Interconnects by Gas Phase Electrodeposition Leslie Schlag; TU Ilmenau FG Nanotechnologie, Germany.

10:45 AM ED9.6.03
The Effects of Organic Acids on Electrodeposited Cu Films in Sub-Micron Trenches Tyler Pounds; Johns Hopkins University, United States.

11:00 AM ED9.6.04
The Impact of Solute Segregation on Grain Boundaries in Dilute Cu Alloys Takanori Tsunemaru1, 2; 1State University of New York Polytechnic Institute, United States; 2SUMCO Corporation, Japan.

11:15 AM ED9.6.05
Growth and Characterization of Ultrathin Conformal Nickel Films by Plasma-Enhanced Atomic Layer Deposition Pouyan Motamed1, 2; National Institute for Nanotechnology, Canada; 1University of Alberta, Canada.

11:30 AM ED9.6.06
A Comprehensive Comparison of Scanning Laser Annealing and Microwave Annealing for Ion Implanted Si Joe Hillman; Universal Laser Systems, United States.

11:45 AM ED9.6.07
Interface-Controlled Carrier Transport in Metal-Lutetium Oxide-Metal Structures Deposited by Electron-Beam Evaporation Technique Khalid Mahmood; Government College University Faisalabad, Pakistan.

SESSION ED9.7: Low-K Materials II
Session Chairs: Vincent Jousseaume and E. Ryan
Wednesday Afternoon, April 19, 2017
PCC North, 100 Level, Room 128 B

1:30 PM *ED9.7.01
Establishing the Relationship between Low-K Dielectric Properties and Intrinsic Conduction and Degradation Mechanisms Chen Wu; imec, Belgium.

2:00 PM ED9.7.02

2:15 PM ED9.7.03
Experimental Study of Plasma-Induced Damage in Cryogenic Etching of Porous Low-K Dielectrics in CF, Br and CF As kar Rezvanov1, 2; 1Moscow Institute of Physics and Technology, Russian Federation; 2Molecular Electronics Research Institute, Russian Federation.