

Clarkson University 21st International Symposium on Chemical-Mechanical Planarization



CENTER FOR ADVANCED
MATERIALS PROCESSING

at
Clarkson University

&

CMP USERS GROUP
(North America)

announce

21st International Symposium
on
*Chemical-Mechanical
Planarization*

August 13-16, 2017

*Crowne Plaza Lake Placid
101 Olympic Drive
Lake Placid, NY 12946
518-523-9410*

Co-chairs:

*S. V. Babu, Clarkson University
Hirokuni Hiyama, EBARA, Japan
Daniel Redfield, Applied Materials
Andrew Carswell, Micron
Matt Prince, Intel
Dinesh Koli, GlobalFoundries
Hari P Amanapu, IBM
Paul Feeney, CMP Users Group
Taesung Kim, SKKU, Korea
Arthur Chen, NTUST, Taiwan*

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registration and final program
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AGENDA

Symposium on Chemical Mechanical Planarization
August 13-16, 2017, Crowne Plaza Lake Placid

Sunday, August 13:

- 12:00 - 5:00 P.M. Hotel and CAMP Registration
5:45 - 7:15 P.M. Cocktail Reception, (**No formal dinner provided**)

Monday, August 14:

- 7:00- 8:10 AM Breakfast

Session I

- 8:00 A.M. **S.V. Babu: Opening Remarks**
8:05 A.M. Cherishing Old Knowledge, Acquiring New
-- Manabu Tsujimura (EBARA Corporation)
8:30 A.M. Polishing Anything with Everything: Common Material Science Themes in the
CMP of Uncommon Materials -- Lee Cook (Recursive Systems LLC)
8:55 A.M. Middle of Line CMP: Stop-on-Selectivity -- Stan Tsai (GlobalFoundries/IBM)
9:20 A.M. Cobalt CMP Development for Advanced Logic Devices
-- Changhong Wu (GlobalFoundries)
9:45 A.M. Coffee Break

Session II

Chair:

- 10:10 A.M. Use of imec's CMP Test Mask for Process Development in FEOL, MOL and
BEOL - Description of test cases in STI/Fin CMP and Co CMP
-- Katia Devriendt (IMEC)
10:35 A.M. Effect of Process Variations on Interconnects Performance in Advance
Semiconductor Manufacturing Nodes -- Prasad Bhosale (IBM, Albany)
11:00 A.M. Cobalt Metallization in MOL Contacts and Related Challenges
-- Vimal Kamineni (GlobalFoundries/IBM)
11:25 A.M. A Closer Look at Defectivity and Defect Types at Advanced (≤ 16 nm) Device
Nodes Following Post-CMP Cleaning -- Paul Bernatis (DuPont)
11:50 A.M. 14nm FinFET Cleaning Technology -- Youngki Ahn (Daelim University)

- 12:15 P.M. Lunch

Session III

Chair:

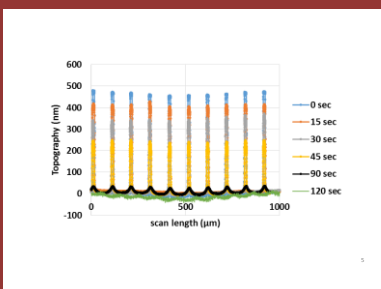
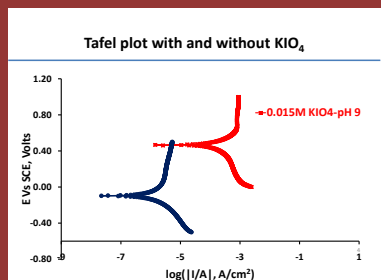
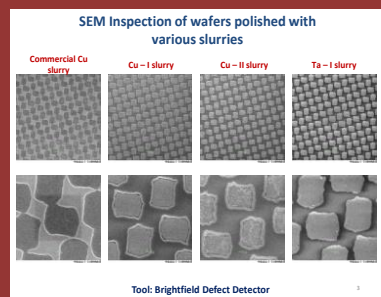
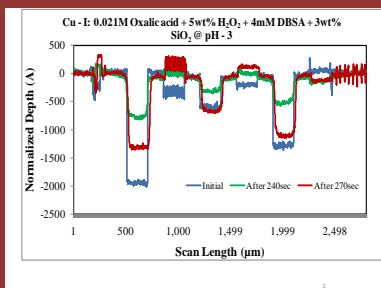
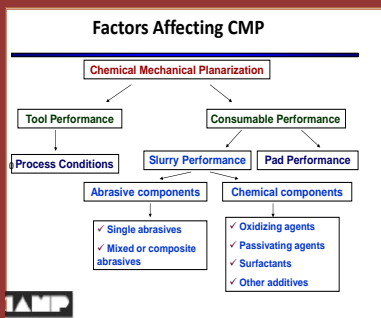
- 3:45 P.M. Using Process Control to Address Challenges in Consistent Cleaning Forces Over
Brush Lifetime – Jaimie Stomberg (Applied Materials)
4:10 P.M. Effects of Back Surface Polishing of Silicon Wafer on Lithography Process
-- Yukiteru Matsui (Toshiba Memory Corporation)

Monday, August 14 continued:

- 4:35 P.M. Post-Oxide CMP Defects Improvement
-- Jimmy Granstrom and Hisashi Takeda (Fujimi Co.)
- 5:00 P.M. Monitoring of Pad Surface Using the Optical Sensor during CMP Process
-- Taesung Kim (Sungkyunkwan University)
- 5:25 P.M. Skin Layer Effect on a PVA Brush Friction
-- Toshiyuki Sanada (Shizuoka University)
- 5:50 -7:00 P.M. Poster Session / Open Bar
- 7:00 P.M. Dinner - After Dinner Speaker: [Semiconductors: The Industry Which Change the World](#), Jason Mazzotti, Director of Deposition ETCH & CMP(GlobalFoundries)

Tuesday, August 15:

- 7:00 - 8:00 A.M. Breakfast
- Session IV Chair:**
- 8:00 A.M. Dynamic Pad Measurement and Monitoring for CMP Pad Performance Index
-- C-C Arthur Chen (National Taiwan University of Science & Technology)
- 8:25 A.M. Characterization of Pad Surfaces for Investigating Conditioner Performance in Dielectric CMP Process Development of 5-7 nm nodes
-- Mayu Yamamura (Applied Materials)
- 8:50 A.M. CVD-Coated Conditioning Disc Designs and Their Effect on Pad Surface Micro-Texture and Copper CMP Performance
--Ara Philipossian (U. Arizona)
- 9:15 A.M. Structures of Cu Surfaces Developing in Benzotriazole Solutions - Effect of pH
-- Eiichi doh (University of Yamanashi)
- 9:40 A.M. Qualitative and quantitative characterization of Cu complex layer in Cu CMP
-- Jingoo Park (Hanyang University)
- 10:05 A.M. Coffee Break
- Session V Chair:**
- 10:30 A.M. Surface Chemistry of Ceria Nanoparticles for CMP Applications
-- Jihoon Seo (Clarkson University)
- 10:55 A.M. Investigation of Polisher Defect Generation Mechanism by Predictable Process Conditions -- Ji Chul Yang (GlobalFoundries)
- 11:20 A.M. Defects Improvement by the Advanced CMP Slurry -- Yoshihiro Izawa¹; Toshio Shinoda¹, Masaki Tada¹, Naoyuki Ishihara¹, Tomohiko Akatuska¹, and Hisashi Takeda² (¹- Fujimi Inc; ² Fujimi Co.)
- 11:45 A.M. Neutral Beam Technology for Nano-Materials and Nano-Devices
-- Seiji Samukawa (Tohoku University)
- 12:10 P.M. Lunch - Remarks by Tony Collins, Clarkson University President
- Session VI Chair:**
- 3:45 P.M. Real Time Process Monitoring with LKPrime and HPPC Hardware Capabilities for Advanced Nodes -- Venkat Hariharan (Applied Materials)
- 4:10 P.M. Characteristics of Wafer Cleaning by Liquid Flow
-- Satomi Hamada (Fhara Corporation)





Tuesday, August 15 continued:

- 4:35 P.M. Defects and Their Formation Mechanism in Middle Of Line (MOL) Tungsten CMP Process, Hong Jin Kim (GlobalFoundries)
- 5:00 P.M. Sputtered TMDC 2D Materials and their Electrical Properties
-- Hitoshi Wakabayashi (Tokyo Institute of Technology)
- 5:25 P.M. A Ring Shape Copper Oxide Formation During Post Cu CMP Cleaning
-- Hojoong Kim (Samsung Electronics)
- 6:15 - 6:30 P.M. Travel to Golf Club
- 6:30 - 7:15 P.M. Reception
- 7:15 P.M. Dinner - After Dinner Speaker: **MATERIALS ENGINEERING: The Foundation of Innovation for the Future** -- Nag Patibandla, VP, Advanced Deposition Products; Office of the CTO, Applied Materials, Inc.

Wednesday, August 16:

7:00 - 8:00 A.M. Breakfast

Session VII Chair:

- 8:05 A.M. Planarization of Silicon Carbide Wafer Using Catalyst-Referred Etching
-- Yasuhisa Sano (Osaka University)
- 8:30 A.M. Advanced Nanocerria for STI Polishing Applications
-- Nate D. Urban, Peter M. Marley and Robert Her, (Ferro Corporation)
- 8:55 A.M. Studying Large Particle Contaminants in Various Nanoparticle Chemical Mechanical Planarization Slurries with Holographic Particle Characterization
-- Fook C. Cheong, Priya Kasimbeg, and Laura A. Phillips (Spheryx Solutions)
- 9:20 A.M. Within-wafer and Within-die Nanotopography Challenges and Characterization for Advanced Logics -- Wei Tsu Tseng (GlobalFoundries)
- 9:45 A.M. Proposal of Optical Measurement Method for 3D Single Nanoparticle Position Near a Surface -- Panart Khajornrungruang (Kyushu Institute of Technology)

Session VIII Chair:

- 10:10 A.M. Coffee Break
- 10:35 A.M. Electrochemical Study of Germanium and Its Application in CMP
-- Baoguo Zhang (Hebei Institute of Technology)
- 11:00 A.M. Challenges and Solutions for Post-CMP Cleaning of Dielectric Surfaces Contaminated with Ceria Nanoparticles – Mechanistic Aspects of Bond Breaking and Particle-Substrate Interfacial Interactions -- Daniela White (Entegris)
- 11:25 A.M. CMP of Low Modulus Films for Next Generation Devices
-- Josiah Jebaraj (Micron)
- 11:50 A.M. Wafer Cleaning Challenges -- Uma Lagudu (Micron)
- 12:15 P.M. Closing Remarks, S.V. Babu, CAMP
- 12:20 P.M. Lunch