# SYMPOSIUM ON ULTRA CLEAN PROCESSING OF SEMICONDUCTOR SURFACES 2018

## PROGRAMME

**Location all presentations: "de Hallen" KULeuven, Naamsestraat 22, 3000 Leuven**
**Room oral presentations: "Promotion hall"**

## MONDAY 3 SEPTEMBER 2018

### SESSION 1 - WELCOME AND OPENING — 08:30 – 09:30

Chair: Takeshi Hattori - Hattori Consulting International, Japan
Co-chair: Mauro Allesandri - STMicroelectronics, Italy

**08:30 - 08:50** — **1.1 - Welcome and opening address**
Paul Mertens
imec, Belgium

**08:50 - 09:30** — **1.2 Keynote presentation:**
**Industry Context for Semiconductor Wet Etch and Surface Preparation (p.3)**
Glenn Gale
TEL, Japan/USA

### SESSION 2A - SURFACE CLEANING AND FUNCTIONALISATION — 9:30 - 10:30

Chair: Christiane Le Tiec (Gottschalk) - MKS Instruments Deutschland GmbH, Germany
Co-chair: Rita Vos - imec, Belgium

**09:30 - 09:50** — **2.1 - Surface Recombination Velocity Imaging of HF-Etched Si Wafers Using Dynamic Heterodyne Lock-In Carrierography** (p.13)
Qiming Sun[1,2], Alexander Melnikov[1,3], Andreas Mandelis[1,2,3], Robert Pagliaro[4]
[1]Center for Advanced Diffusion-Wave and Photoacoustic Technologies (CADIPT), University of Toronto, Toronto, M5S 3G8, Canada; [2]School of Optoelectronic Science and Engineering, University of Electronic Science and Technology of China, Chengdu, 610054, China; [3]Diffusion-Wave Diagnostic Technologies, Toronto, M1M 2V3, Canada; [4]Advanced Processing Equipment Technology (APET) Co., Ltd, 20-15, Sukwoo-Dong, Hwaseong-City, Gyunggi-Do, 463-802, Korea

**09:50 - 10:10** — **2.2 - Organic Material Removal by Thermally Activated Ozone Gas** (p.19)
Kota Sotoku, Masaki Inaba, Hiroaki Takahashi
SCREEN Semiconductor Solutions Co., Ltd., Japan

**10:10 - 10:30** — **2.3 - Carbon Removal and Native Oxide Cleaning on Si and SiGe Surfaces in Previum Chamber** (p.25)
Fei Wang, Bubesh Babu Jotheeswaran, John Tolle, Xing Lin, Peipei Gao, Alex Demos
ASM America, United States of America

***10:30 - 10:50 — COFFEE BREAK***

## SESSION 2B - SURFACE CLEANING AND FUNCTIONALISATION 10:50 - 11:50

Chair: Christiane Le Tiec (Gottschalk), MKS Instruments Deutschland GmbH, Germany

Co-chair: Rita Vos - imec, Belgium

**10:50 - 11:30**

**2.4 Invited presentation:**

**Surface functionalization of silicon-rich materials: chemistry at the outmost nanometer**

Han Zuilhof

University of Wageningen, The Netherlands

**11:30 - 11:50**

**2.5 - Vapor-Phase Deposition of $N_3$-Containing Monolayers on $SiO_2$ and $Si_3N_4$ for Wafer Scale Biofunctionalization** **(p.31)**

Rita Vos, Tim Steylaerts, Karolien Jans, Tim Stakenborg

imec, Belgium

## POSTER ANNOUNCEMENTS 11:50 - 12:20

Chair: Marc Meuris – imec, Belgium

Co-chair: Ara Philipossian – University of Arizona, USA

*Each poster author is allocated 3 minutes to advertise his/her poster using max 3 slides*

**P01 - Versatile aqueous chemistry for selective Ru or WNx Etch and Implant BARC Removal in 5/3 nm Applications (p.288)**

Chien-Pin S. Hsu, Polly Yi-Ting Chen

Avantor, Taiwan

**P02 - Is highly selective Si3N4/SiO2 etching feasible without phosphoric acid? (p.147)**

Changjin Son, Taehyeon Kim, Taegun Park, Sangwoo Lim

Yonsei University, Korea, Republic of (South Korea)

**P03 - Developing Integrated Solutions and Wet Cleans to Eliminate Tungsten Contact Attack in Sub 1*x* nm Nodes (p.273)**

Akshey Sehgal, Michael DeVre, Elango Balu

GLOBALFOUNDRIES Inc., United States of America

**P04 - BEOL Post-etch clean robustness improvement with ultra-diluted HF for 28nm node. (p.244)**

Lucile Broussous[1], Remy Fabre[1], Thomas Massin[1], Fabrice Buisine[2], Alain Lamaury[2], Hidekazu Ishikawa[2]

[1]STMicroelectronics, France; [2]SCREEN SPE, Germany

**P05 - Influence of VPT-Induced Trace Particles on Sensitivity in TXRF Measurements (p.309)**

Koichiro Saga, Rikiichi Ohno

Sony Semiconductor Solutions Corporartion, Japan

**P06 - Post-CMP Cleaners for Tungsten Advanced Nodes: 10nm and 7nm (p.278)**

Ruben Lieten[1], Daniela White[2], Thomas Parson[2], Michael White[2]

[1]Entegris, Gmbh; [2]Entegris, Inc

**P07 - Investigation of defectivity coming from the back side of wafers during AlCu polymer removal processes performed in a batch spray tool (p.220)**

Ivan Venegoni, Silvia Brazzelli, Roberta Gomarasca, Francesco Pipia, Mauro Alessandri

STMicroelectronics, Italy

**P08 - Advanced Data Analysis Strategies for Understanding Particle Contamination in Chemical Distribution Systems (p.314)**

Duncan Cooper, David Green, Dan Rodier

Particle Measuring Systems, Germany

**P09 - Electrostatic Discharge Control and Visualization in Spray Nozzle (p.77)**

JI HOON CHA, TAE-HONG KIM, YOUNG-HOO KIM, KUNTACK LEE, YONGSUN KOH

SAMSUNG ELECTRONICS, Korea, Republic of (South Korea)

**P10 - Drying Stability and Critical Height of Repeating Line/Space Structures (p.161)**

Derek Bassett

Tokyo Electron America, United States of America

***12:20 - 14:00 LUNCH – POSTER VIEWING***

## SESSION 3A - WETTING, DRYING AND PATTERN COLLAPSE 14:00 - 15:00

Chair: Fumihiro Amemiya – Central Glas, Japan
Co-chair: Ogawa Yoshihiro – Toshiba Memory Corporation, Japan

**14:00 - 14:20** **3.1 - Exploring the dynamics superhydrophobic breakdown at the nanoscale using ATR-FTIR** (p.175)

Nandi Vrancken[1,2], Stefanie Sergeant[1], Guy Vereecke[1], Frank Holsteyns[1], Herman Terryn[2], Stefan De Gendt[1,3], XiuMei Xu[1]
[1]imec, Belgium; [2]VUB, Belgium; [3]KU Leuven, Belgium
**(student paper)**

**14:20 - 14:40** **3.2 - Fixed charge control of silylated surface for stiction-free drying with surface energy reduction process** (p.168)

Tatsuhiko Koide, Shinsuke Kimura, Kobayashi Takashi, Iimori Hiroyasu, Sugita Tomohiko, Sato Katsuhiro, Ogawa Yoshihiro
Toshiba Memory Corporation, Japan

**14:40 - 15:00** **3.3 - Effect of 1-D nano-confinement on the kinetics of a click-chemistry surface reaction** (p.182)

Guy Vereecke[1], Haroen Debruyn[2], Quinten De Keyzer[2], Rita vos[1], Abhishek Dutta[2], Frank Holsteyns[1]
[1]imec, Belgium; [2]Faculty of Engineering Technology Campus Group T, Katholieke Universiteit Leuven, Belgium

*15:00 - 15:30* ***COFFEE BREAK***

## SESSION 3B - WETTING, DRYING AND PATTERN COLLAPSE 15:30 - 16:50

Chair: Fumihiro Amemiya – Central Glas, Japan
Co-chair: Ogawa Yoshihiro – Toshiba Memory Corporation, Japan

**15:30 - 15:50** **3.4 - Cleaning of high aspect ratio STI structures for advanced logic devices by implementation of a surface modification drying technique** (p.190)

Farid Sebaai[1], Guy Vereecke[1], XiuMei Xu[1], Sylvain Baudot[1], Fumihiro Amemiya[2], Kana Komori[3], Frank Holsteyns[1]
[1]imec, Belgium; [2]Central Glass; [3]SCREEN

**15:50 - 16:10** **3.5 - Pattern Collapse-Free Drying with Sacrificial Gap Fill Polymers** (p.194)

Evelyn A Kennedy, Desaraju Varaprasad, Songyuan Xie, Amanuel Gebrebrhan, Hongmin Huang, Joseph Kennedy
Honeywell International Inc, United States of America

**16:10 - 16:30** **3.6 - Factors Influencing Drying Induced Pattern Collapse** (p.201)

David Mui, Nathan Musselwhite, Mark Kawaguchi
Lam Research, United States of America

**16:30 - 16:50** **3.7 - 300 mm wafer development for pattern collapse evaluations** (p.207)

XiuMei Xu[1], Tao Zheng[1], Mohamed Saib[1], Farid Sebaai[1], Jeroen van de Kerkhove[1], Nandi Vrancken[1,2], Guy Vereecke[1], Frank Holsteyns[1]
[1]imec, Belgium; [2]VUB, Pleinlaan 2, 1050 Elsene, Belgium

*17:30 - 18:30* ***POSTER RECEPTION***

## TUESDAY 4 SEPTEMBER 2018

### SESSION 4 - SURFACE PREPARATION OF III-V SEMICONDUCTORS 08:20 - 10:00

Chair: Joel Barnett – TEL, USA
Co-chair: Anthony Muscat – University of Arizona, USA

**08:20 - 09:00**

**4.1 Invited presentation:**
**Toward the Surface Preparation of InGaAs for the Future CMOS Integration (p.39)**
Sangwoo Lim
Yonsei University, Seoul, Korea

**09:00 - 09:20**

**4.2 - Effect of Wet treatment on Group III-V Compound Semiconductor Surface (p.43)**
Kenya Nishio, Suguru Saito, Yoshiya Hagimoto, Hayato Iwamoto
Sony Semiconductor Solutions Corporation, Japan

**09:20 - 09:40**

**4.3 - Nanoscale Etching of GaAs and InP in Acidic $H_2O_2$ Solution: a Striking Contrast in Kinetics and Surface Chemistry (p.48)**
Dennis Henri van Dorp[1], Sophia Arnauts[1], Mikko Laitinen[2], Timo Sajavaara[2], Johan Meersschaut[1], Thierry Conard[1], Frank Holsteyns[1], John Kelly[3]
[1]imec, Belgium; [2]University of Jyväskylä, Finland; [3]Utrecht University, The Netherlands

**09:40 - 10:00**

**4.4 - Ion Implanted Photoresist Removal by Material Loss-Free Organic Solvent (p.52)**
Eunseok Oh, Sangwoo Lim
Yonsei University, Korea, Republic of (South Korea)
**(student paper)**

***10:00 - 10:30 COFFEE BREAK***

### SESSION 5 - Si AND Ge ETCHING 10:30 - 11:30

Chair: Simon Braun – imec, Belgium
Co-chair: Sangwoo Lim – Yonsei University, Korea

**10:30 - 10:50**

**5.1 - Behavior Analysis of Si Etching Process with $HF/HNO_3$ Mixture in Single-Spin Wafer Process (p.83)**
Takashi Oinoue[1], Suguru Saito[2], Atsushi Okuyama[2], Yoshiya Hagimoto[2], Hayato Iwamoto[2]
[1]Sony Semiconductor Manufacturing, Japan; [2]Sony Semiconductor Solutions, Japan

**10:50 - 11:10**

**5.2 - Study of the Anisotropic Wet Etching of Nanoscale Structures in Alkaline Solutions. (p.88)**
Antoine Pacco[1], Zainul Aabdin[3], Utkarsh Anand[2], Jens Rip[1], Utkur Mirsaidov[2], Frank Holsteyns[1]
[1]imec, Belgium; [2]National University of Singapore; [3]A*STAR Singapore

**11:10 - 11:30**

**5.3 - Unexpected Pyramid Texturization of n-type Ge (100) via Electrochemical Etching: Bridging Surface Chemistry and Morphology (p.94)**
Graniel Harne Abrenica[1,2], Mikhail Lebedev[3], Hy Le[2], Andreas Hajduk[4], Mathias Fingerle[4], Thomas Mayer[4], Stefan de Gendt[1,2], Dennis van Dorp[2]
[1]KU Leuven; [2]imec, Belgium; [3]Ioffe Institute; [4]TU Darmstadt

(student paper)

## SESSION 6 - SELECTIVE $Si_xGe_y$ ETCHING FOR NANOWIRE RELEASE 11:30 - 12:30

Chair: Kurt Wostyn – imec, Belgium
Co-chair: Olivier Vatel – Screen Semiconductor Solutions, Japan

**11:30 - 11:50** **6.1 - Selective Wet Etching in Fabricating SiGe and Ge Nanowires for Gate- All-Around MOSFETs** (p.101)

Wen Dar Liu[1], Yi Chia Lee[1], Ryo Sekiguchi[2], Yukifumi Yoshida[3], Kana Komori[3], Kurt Wostyn[4], Farid Sebaai[4], Frank Holsteyns[4]

[1]Versum Materials Technology, Taiwan; [2]Versum Materials Japan, INC; [3]SCREEN Semiconductor Solutions Co., Ltd; [4]imec vzw

**11:50 - 12:10** **6.2 - SiGe vs. Si Selective Wet Etching for Si Gate-All-Around** (p.107)

Kana Komori[1], Jens Rip[2], Yukifumi Yoshida[1], Kurt Wostyn[2], Farid Sebaai[2], Wen Dar Liu[3], Yi Chia Lee[3], Ryo Sekiguchi[4], Hans Mertens[2], Andriy Hikavyy[2], Frank Holsteyns[2], Naoto Horiguchi[2]

[1]SCREEN Semiconductor Solutions Co., Ltd.; [2]IMEC VZW; [3]Versum Materials Technology LLC.,; [4]Versum Materials Japan, INC

**12:10 - 12:30** **6.3 - A New Method to Fabricate Ge Nanowires: Selective Lateral Etching of GeSn:P/Ge Multi-Stacks** (p.113)

Clement Porret[1], Anurag Vohra[1,2], Farid Sebaai[1], Bastien Douhard[1], Andriy Hikavyy[1], Roger Loo[1]

[1]imec, Kapeldreef 75, B-3001 Leuven, Belgium; [2]K.U. Leuven, Dept. of Physics, Celestijnenlaan 200D, 3001 Leuven, Belgium

***12:30 - 14:00*** ***LUNCH***

13:30 *gather on the stair case: group picture will be taken*

## SESSION 7 – GATE-ALL-AROUND GATE STACK PROCESSING 14:00 - 15:00

Chair: Glen Gale – TEL, Japan/USA
Co-chair: Mauro STMicroelectronics, Italy

**14:00 - 14:20** **7.1 - Customized Chemical Compositions Adaptable for Cleaning Virtually All Post-Etch Residues** (p.121)

Jerome DAVIOT[1], Marine Audoui[1], Christian Pizzetti[1], Philippe Garnier[2], lucile Broussous[2], Pascal Besson[3], Laurence Gabette[3], David Maloney[1]

[1]Technic, France; [2]ST microelectronics; [3]LETI

**14:20 - 14:40** **7.2 - Low Temperature SiGe Steam Oxide – Aqueous HF and NH3/NF3 Remote Plasma Etching and its Implementation as Si GAA Inner Spacer** (p.126)

Kurt Wostyn, Karine Kenis, Hans Mertens, Andriy Hikavyy, Frank Holsteyns, Naoto Horiguchi

imec, Belgium

**14:40 - 15:00** **7.3 - RMG Patterning by Digital Wet Etching of Polycrystalline Metal Films** (p.132)

Yusuke Oniki, Guy Vereecke, Eugenio Dentoni Litta, Lars-Åke Ragnarsson, Harold Dekkers, Tom Schram, Frank Holsteyns, Naoto Horiguchi

imec, Belgium

| *15:00 - 15:30* | *COFFEE BREAK* |
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## SESSION 8 - MECHANICAL PARTICLE REMOVAL — 15:30 - 16:30

Chair: Ara Philipossian – University of Arizona, USA
Co-chair: Harold Okorn-Schmidt – LLRC OG, Austria

**15:30 - 15:50**

**8.1 - Removal of CrN Contamination from EUV Mask Backside using Dry Cleaning** **(p.59)**

Hyuntae Kim, Nagendra Prasad, Hee-Jin Song, Jin-Goo Park

Hanyang University, Korea, Republic of (South Korea)

**(student paper)**

**15:50 - 16:10**

**8.2 – Damage-Free Cleaning of Advanced Structure using Timely Energized Bubble Oscillation Megasonic Technology** **(p.64)**

David Wang[1], Fuping Chen[1], Xaioyan Zhang[1], Sally-Ann Henry[1], Zhenming Chu[1], Feng Liu[1], Yang Chen[1], Kwangkee Chae[1], Fufa Chen[1], Yefang Zhu[2], Lihua Ni[2], Yu Zhang[2], haibo Lei[2], Fang Li[2], Tao Zhang[2], Xi Wang[1]

[1]ACM Research Inc, United States of America; [2]Shanghai Huali Microelectronics Corporation

**16:10 - 16:30**

**8.3 - An Observation Method of Real Contact Area during PVA Brush Scrubbing** **(p.73)**

Toshiyuki Sanada[1], Masanao Hanai[1], Akira Fukunaga[2], Hirokuni Hiyama[2]

[1]Shizuoka University; [2]Ebara Corporation

## SESSION 9 - NON-SEMICONDUCTOR FILM ETCHING — 16:30 - 17:10

Chair: Francesco Pipia – STMicroelectronics, Italy
Co-chair: Martin Knotter –NXP Semiconductors, Nijmegen, The Netherlands

**16:30 - 16:50**

**9.1 - Wet Etchants Penetration through Photoresist during Wet Patterning** **(p.141)**

Philippe Garnier

STMicroelectronics, France

**16:50 - 17:10**

**9.2 - Self-Aligned Contacting Processes for the 80 nm p-MTJ Device Fabrication by Wet Approach** **(p.152)**

Hushan Cui[1,2,3], Kaihua Cao[1,2,3], Youguang Zhang[1,2], Huagang Xiong[2], Jiaqi Wei[1,2,3], Junjie Li[3], Guobin Bai[3], Junfeng Li[3], Chao Zhao[1,2,3], Weisheng Zhao[1,2]

[1]Fert Beijing Institute, BDBC, Beihang University, 100191, P.R. China; [2]School of Electronic and Information Engineering, Beihang University, 100191, P.R. China; [3]Insititute of Microelectronics of Chinese Academy of Sciences, 100029, P.R. China

**(student paper)**

*18:00* *Short guided walk: from Naamsestraat 22 towards the Faculty Club (conference diner)*

| *19:00 - 22:00* | *CONFERENCE DINNER (Faculty Club)* |
|---|---|

# WEDNESDAY 5 SEPTEMBER 2018

## SESSION 10 - BIOSENSING SURFACES 08:30 - 09:10

Chair: Jin-Goo Park – Han-Yang University, Korea
Co-chair: Rita Vos – imec, Belgium

**08:30 - 09:10**

**10.1 - Invited presentation:**
**Putting DNA Nanotechnology to Work:**
**the Art of DNA Origami towards Innovative Biosensing Surfaces**
**for Medical Diagnostics**
Jeroen Lammertijn
KU Leuven, Belgium

## SESSION 11A – INTERCONNECTS 09:10 - 10:10

Chair: Els Kesters – imec, Belgium
Co-chair: Lucille Brousous – STMicroelectronics, France

**09:10 - 09:30**

**11.1 - AlCu Pitting Prevention in Post Etch Cleaning** (p.213)
Annamaria Votta, Roberto Morandi, Marcello Ravasio, Giovanni Tagliabue, Francesco Pipia, Mauro Alessandri
STMicroelectronics, Italy

**09:30 - 09:50**

**11.2 - Aluminum Cleaning on Single Wafer Tool : a Case Study with Diluted HF** (p.226)
Lucile Broussous
STMicroelectronics, France

**09:50 - 10:10**

**11.3 - Atomic Layer Deposition of TiN below 600 K using N2H4** (p.232)
Adam Hinckley, Anthony Muscat
University of Arizona, United States of America

*10:10 - 10:30* ***COFFEE BREAK***

## SESSION 11B: INTERCONNECT 10:30 – 12:30

Chair: Els Kesters – imec, Belgium
Co-chair: Lucille Brousous – STMicroelectronics, France

**10:30 - 10:50**

**11.4 - Process Parameter Control for BEOL TiN Hard Mask Etch-Back** (p.238)
Harald Okorn-Schmidt[1], Philipp Engesser[1], Manuel Linder[2], Jörg Hofer-Moser[2]
[1]LLRC OG, Austria; [2]4Tex GmbH

**10:50 - 11:10**

**11.5 - Optimization of Wet Strip for Metal Void Reduction in Trench-First Metal Hard Mask Back-End of Line Process** (p.250)
Asha Sharma, Bruce Gondeck, Sunil Singh, Teck Jung Tang, SherJang Singh, Silas Scott, Philippe Helal
GlobalFoundries, United States of America

**11:10 - 11:30**

**11.6 - Corrosion of Co in BEOL Interconnects in Dilute HF Solution** (p.256)
Yuya Akanishi[1], Els Kesters[2], Quoc Toan Le[2], Frank Holsteyns[2]

[1]SCREEN Semiconductor Solutions Co., Ltd., Japan; [2]imec vzw, Belgium

**11:30 - 11:50**

**11.7 - Effect of Cleaning Chemistries on Cobalt: Surface Chemistries and Electrical Characterization** **(p.263)**

Quoc-Toan Le[1], Els Kesters[1], Yuya Akanishi[2], Marleen van der Veen[1], Atsushi Mizutani[3], Frank Holsteyns[1]

[1]IMEC vzw, Belgium; [2]SCREEN Semiconductor Solutions Co., Ltd., Japan; [3]FUJIFILM Electronic Materials (Europe) N.V., Belgium

**11:50 - 12:10**

**11.8 - Optimization of Post Etch Cobalt Compatible Clean by pH and Oxidizer** **(p.268)**

Hideaki Iino[1], Nobuko Gan[1], Yuichi Ogawa[1], Toru Masaoka[1], Quoc Toan Le[2], Els Kesteras[2], Jens Rip[2], Yusuke Oniki[2], Yuya Akanishi[3], Frank Holsteyns[2]

[1]KURITA WATER INDUSTRIES Ltd., Japan; [2]imec vzw; [3]SCREEN Semiconductor Solutions Co., Ltd.

**12:10 - 12:30**

**11.9 - Wet-Chemical Etching of Ruthenium in Acidic Ce4+ Solution** **(p.284)**

Harold Philipsen[1], Sander Teck[1,2], Nils Mouwen[1,2], Wouter Monnens[1,3], Quoc Toan Le[1]

[1]IMEC, Kapeldreef 75, 3001, Leuven, Belgium; [2]KU Leuven, Technology Campus Groep T Leuven, Andreas Vesaliusstraat 13, 3000, Leuven, Belgium; [3]KU Leuven, Celestijnenlaan 200F, 3001, Leuven, Belgium

***12:30 - 14:00*** ***LUNCH BREAK***

## SESSION 12 - WET PROCESSING FOR PHOTOVOLTAIC SOLUTIONS 14:00 - 14:40

Chair: Dennis van Dorp – imec, Belgium

Co-chair: Simon Braun – imec, Belgium

**14:00 - 14:20**

**12.1 - Wet Processing in State-of-the-Art Cu(In,Ga)(S,Se)2 Thin Film Solar Cells** **(p.300)**

Dilara Gokcen Buldu[1,2], Jessica de Wild[1,2], Thierry Kohl[1,2], Sunil Suresh[3,5], Gizem Birant[1,2], Guy Brammertz[1,2], Marc Meuris[1,2], Jef Poortmans[1,3,4], Bart Vermang[1,2]

[1]Institute for Material Research (IMO), Hasselt University, Belgium; [2]Imec division IMOMEC (partner in Solliance & EnergyVille), Belgium; [3]imec (partner in Solliance & EnergyVille), Belgium; [4]Department of Electrical Engineering, KU Leuven, Belgium; [5]Photovoltaic Materials and Device, Delft University of Technology, Netherlands

**(student paper)**

**14:20 - 14:40**

**12.2 - Impact of Controlled Ni Contamination on Silicon Solar Wafer Material** **(p.295)**

Mateusz Gocyla, Michael Haslinger, Paul W. Mertens, Joachim John

Imec, Belgium

***14:40 - 15:00*** ***COFFEE BREAK***

## SESSION 13 - CONTAMINATION: METROLOGY AND CONTROL 15:00 - 15:40

Chair: Philippe Garnier – STMicroelectronics, France
Co-chair: Takeshi Hattori – Hattori Consulting International, Japan

**15:00 - 15:20**

**13.1 - Determination of HCl Transport Coefficients in Real FOUP Polymers for HCl Cross-Contamination Assessment from FOUP to Wafer** (p.321)

Minh-Phuong TRAN[1], Hervé FONTAINE[1], Carlos BEITIA[1], Paola GONZALEZ-AGUIRRE[2], Jorgen LUNGREN[2], Sung-In MOON[2]
[1]CEA TECH, France; [2]ENTEGRIS, France

**15:20 - 15:40**

**13.2 - Yield Enhancement due to Addition of Bevel Cleans at Middle of Line(MOL) Zone** (p.329)

Tsultrim Tharchin, Elango Balu
GLOBALFOUNDRIES, United States of America

## CLOSING SESSION 15:40 - 16:15

**15:40 - 16:00**

**Student paper award announcement**
**Kurt Wostyn**
Imec, Belgium

**16:00 – 16:15**

**Closing remarks**
Paul Mertens
Imec, Belgium