08:30   Part 1

**Short Course: Power Electronics Packaging (C-Liu part 1)**
*Boardroom*
*Instructed by Prof. Sheng Liu*  
*Sunday March 24 2019  08:30*

10:30   Coffee break

**Short Course: Design for Reliability in MEMS (C-Corigliano Part 1)**
*Salon 4*
*Instructed by Prof. Alberto Corigliano*  
*Sunday March 24 2019  08:30*

10:45   Part 2

**Short Course: Power Electronics Packaging (C-Liu part 2)**
*Boardroom*
*Instructed by Prof. Sheng Liu*  
*Sunday March 24 2019  10:45*

10:45   Part 2

**Short Course: Design for Reliability in MEMS (C-Corigliano part 2)**
*Salon 4*
*Instructed by Prof. Alberto Corigliano*  
*Sunday March 24 2019  10:45*

13:00   Lunch in Bankett Foyer
14:00  Short Course: System-Level Simulation of Microsystems-MOR (C-Bechtold Part 1)  
Boardroom  
Instructed by Prof. Dr.-Ing. Tamara Bechtold

14:00  Short Course: Reliability of Semiconductor Devices (C-Pufall)  
Salon 4  
Instructed by Prof. Reinhard Pufall

14:00  Short Course: Molecular Modelling (C-Iwamoto Part 1)  
Salon 2 & 3  
Instructed by Dr. Nancy Iwamoto

16:00  Coffee break

16:15  Short Course: Applications of test chips (C-Suhling)  
Salon 4  
Instructed by Prof. Jeffrey C. Suhling

16:15  2h course
Short Course: System-Level Simulation of Microsystems-MOR (C-Bechtold Part 2)

*Boardroom*

*Instructed by Prof. Dr.-Ing. Tamara Bechtold*

Sunday March 24 2019  16:15

16:15  Part 2

---

Short Course: Molecular Modelling (C-Iwamoto Part 2)

*Salon 2 & 3*

*Instructed by Dr. Nancy Iwamoto*

Sunday March 24 2019  16:15

16:15  Part 2
### Industry keynotes

**Welcome by W. van Driel**

**09:15  Monday March 25 2019**  
*Chaired by Willem van Driel and Kouchi Zhang*

<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
<th>Speaker/Company</th>
</tr>
</thead>
<tbody>
<tr>
<td>09:15</td>
<td>Pushing the limits of MEMS - Success factors design and simulation</td>
<td>Udo-Martin Gómez, Robert Bosch GmbH</td>
</tr>
<tr>
<td>09:45</td>
<td>Package Developments at Qualcomm</td>
<td>Ahmer Syed, Qualcomm</td>
</tr>
<tr>
<td>10:15</td>
<td>Package Development for Autonomous Driving</td>
<td>Darrel Frear, NXP</td>
</tr>
<tr>
<td>10:45</td>
<td>Coffee break</td>
<td></td>
</tr>
</tbody>
</table>
11:15 Monday March 25 2019

Technical Keynotes - I — Session 1

Chaired by Chris Bailey and Peter Rodgers

11:15 Future Challenges related to Thermo-Mechanics, Multi-Physics, Thermal and Reliability in Microelectronics and Microsystems
60mn
C. Bailey, University of Greenwich, London, UK
B. Vandevelde, IMEC, Leuven, Belgium
W. van Driel, Signify, Eindhoven, The Netherlands
Peter Rodgers, Khalifa University, Abu Dhabi, UAE

12:15 Past, present and future of EuroSimE
30mn
Prof. G.Q. Zhang, Delft University of Technology, The Netherlands

12:45 Lunch
Session 2 — Solder joint reliability

Monday March 25 2019 14:00

Chaired by Torsten Hauck and Piet Watté

Salon 5-6

14:00 Numerical study on local effects of composition and geometry in self-healing solders
Georg Siroky 1, Elke Kraker 2, Julien Magnien 2, Ernst Kozeschnik 3, Dietmar Kieslinger 4, Werner Ecker 2
1 Technical University Vienna / Materials Center Leoben GmbH
2 Materials Center Leoben GmbH
3 Technical University Vienna
4 ZKW Electronics GmbH

14:30 Transgranular Crack Propagation in Thermal Cycling of SnAgCu Solder Joints
Andreas Lövberg, Per-Erik Tegehall, RISE IVF, Mölndal, Sweden

14:50 Improved QFN thermal cycling reliability using low melting temperature SnBi based solder paste LMPA-Q
Bart Vandevelde 1, Riet Labie 1, Ralph Lauwaert 2, Daniel Werkhoven 2, Daniel Vanderstraeten 3, Eddy Blansaer 3, Jonas Lannoo 4, Davy Pissoort 4
1 Imec, Leuven, Belgium
2 Interflux Electronics, Gent, Belgium
3 ON Semiconductor Belgium, Oudenaarde, Belgium
4 KU Leuven Bruges Campus, Brugge, Belgium

15:10 Effect of Stress State on Fatigue Characterization of SAC305 Solder Joints
Abhishek Deshpande, Hannah Kaeser, Abhijit Dasgupta, University of Maryland, College Park, USA

15:30 Numerical Prediction of Failure in SnAgCu solder under shear and tensile-dominant cyclic loading
M. Kuczynska 1, Y. Maniar 2, N. Schafet 3, U. Becker 3, S. Weihe 4
1 Robert Bosch GmbH, Automotive Electronics Division, Stuttgart, Germany; Materials Testing Institute (MPA) University of Stuttgart, Stuttgart, Germany
3 Robert Bosch GmbH, Automotive Electronics Division, Stuttgart, Germany
4 Materials Testing Institute (MPA) University of Stuttgart, Stuttgart, Germany
Simulation and Design of an Optical Accelerometer
Veronique Rochus, Wouter Westerveld, Bruno Figeys, Xavier Rottenberg, Roelof Jansen, imec

Finite element method simulation of graphene phononic crystals with cross-shaped nanopores
Seiya Kubo¹, Marek E. Schmidt¹, Manoharan Muruganathan¹, Hiroshi Mizuta²
¹ Japan Advanced Institute of Science and Technology
² Japan Advanced Institute of Science and Technology, Hitachi Cambridge Lab, UK

Enhanced Fluid Flow by Wavelike Excitation of a Micromechanical Bending Actuator
Wolfgang Hölzl, Regine Behlert, Matthias Gehring, Gabriele Schrag, Technical University of Munich, Munich, Germany

Optical micro-machined ultrasound sensors with a silicon photonic resonator in a buckled acoustical membrane
Wouter J. Westerveld¹, Suzanne M. Leinders², Paul L. M. J. van Neer³, H. Paul Urbach², Nico de Jong², Martin D. Verweij², Xavier Rottenberg¹, Veronique Rochus¹
¹ Imec, Leuven, Belgium
² Delft University of Technology, Delft, The Netherlands
³ TNO, Den Haag, The Netherlands

Modelling of display-compatible piezoelectric micromachined ultrasonic transducers for haptic feedback
Alexandre Halbach, Pieter Gijsenbergh, Yongbin Jeong, Margo Billen, Christopher Chare, Hang Gao, Guilherme Brondani Torri, David Cheyns, Xavier Rottenberg, Veronique Rochus, IMEC
Session 4 — Thermal Behavioral Modelling

Monday March 25 2019 14:00

Chaired by René Metasch and Péter Pálovics

Salon 2-3

14:00 Analysis of Self Heating Effect in Vertical-channel Field Effect Transistor
30mn

Ilho Myeong ¹, Jongwook Jeon ², Myounggon Kang ³, Hyungcheol Shin ¹

¹ Inter-University Semiconductor Research Center (ISRC) and School of Electrical Engineering, Seoul National University
² Department of Electronics Engineering, Konkuk University
³ Department of Electronic Engineering, Korea National University of Transportation

14:30 Numerical simulation of reflow soldering
20mn

Michael Stadler, Infineon

14:50 Simulation of self-heating of printed interconnects for thermal design
20mn

Daniel Bülz, Petra Streit, Roman Forke, Thomas Otto, Fraunhofer Institute For Electronic Nanosystems, Chemnitz, Germany

15:10 Advanced Electro-Thermal Analysis of IGBT Modules in a Power Converter System
20mn

Xiang Li ¹, Daohui Li ¹, Fang Qi ², Matthew Packwood ¹, Haihui Luo ², Guoyou Liu ², Yangang Wang ², Xiaoping Dai ²

¹ Power Semiconductor R
² CRRC Times Electric Co. Ltd, Zhuzhou, China

15:30 Modelling of thermal processes in thin-film BAW resonators
20mn

Alexander Kozlov, Omsk State Technical University, Omsk, Russia

15:50 Coffee break
16:30 Smart textiles: how electronics merge into our clothing
30mn
Kaspar Jansen, Delft University of Technology, Department of Design Engineering, The Netherlands

17:00 Degradation Prediction of Electronic Packages using Machine Learning
20mn
Alexandru Prisacaru¹, Ernesto Oquelis Guerrero¹, Przemyslaw Jakub Gromala¹, Bongtae Han², Guo Qi Zhang³
¹ Robert Bosch GmbH
² University of Maryland College Park
³ Delft University of Technology

17:20 A Combined Methodology to Include System Effects in Board-Level Stress Simulations
20mn
Rainer Dudek¹, Marcus Hildebrandt¹, Sven Rzepka¹, Ralf Döring², Lutz Scheiter², Bastian Tröger³, Mengjia Zhang⁴, Reinhold W. Ortmann⁵
¹ Fraunhofer ENAS, Dept. MMC, Chemnitz, Germany
² CWM GmbH, Chemnitz, Germany
³ FRT GmbH, Bergisch-Gladbach, Germany
⁴ Robert Bosch GmbH, AE/ESI4.1, Reutlingen, Germany
⁵ Continental Automotive France SAS, France

17:40 A Probabilistic approach to the robust thermo-mechanical analysis of Ball Grid Array Solder Joints
20mn
Ayda Halouani¹, Abel Cherouat², Mariem Miladi Chaabane³, Mohamed Haddar³
¹ Charles Delaunay Institute, GAMMA3, University of Technology of Troyes, France and Laboratory of Mechanics, Modeling and Production, National School of Engineers of Sfax, Tunisia
² Charles Delaunay Institute, GAMMA3, University of Technology of Troyes, France
³ Laboratory of Mechanics, Modeling and Production, National School of Engineers of Sfax, Tunisia

18:00 Development of a Modular Test Setup for Reliability Testing under Harsh Environment Conditions
20mn
Laura Wambera¹, Karsten Meier¹, Robert Höhne¹, Björn Böhme², Christian Götze², Jens Paul², Marcel Wieland², Karlheinz Bock¹
¹ Technische Universität Dresden, Institute of Electronic Packaging Technology, Dresden, Germany
² GLOBALFOUNDRIES, Dresden Module One LLC
# Session 6 — Multi-Physics process models

**Chaired by Dag Andersson and Cadmus Yuan**

**Monday March 25 2019 16:30**

**Salon 2-3**

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### 16:30 Micro-Transfer-Printing and Potential Process Optimizations by FEA

<table>
<thead>
<tr>
<th>Kjell Buehler</th>
<th>Georg Lorenz</th>
<th>Marcel Mittag</th>
<th>Uwe Krieger</th>
<th>Niclas Heise</th>
<th>Sebastian Wicht</th>
<th>Ronny Gerbach</th>
<th>Falk Naumann</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Fraunhofer Institute for Microstructure of Materials and Systems IMWS, Halle (Saale), Germany</td>
<td></td>
<td></td>
<td></td>
<td>2</td>
<td>X-FAB MEMS Foundry GmbH, Erfurt, Germany</td>
<td>3</td>
</tr>
</tbody>
</table>

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### 17:00 Numerical modelling of magnetic nanoparticle dynamics in microfluidic devices

| Péter Pálovics | Márta Rencz | Budapest University of Technology and Economics, Department of Electron Devices, Hungary |

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### 17:20 Modeling temperature dependent chemical reaction of intermetallic compound growth

<table>
<thead>
<tr>
<th>Aleksandr Morozov</th>
<th>Alexander Freidin</th>
<th>Wolfgang Müller</th>
<th>Alexander Semencha</th>
<th>Mikhail Tribunskiy</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Berlin Institute of Technology, Berlin, Germany</td>
<td>2</td>
<td>Peter the Great St. Petersburg Polytechnic University, St. Petersburg, Russia</td>
<td></td>
</tr>
</tbody>
</table>

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### 17:40 Virtual Prototyping and Simulation of Electro-Thermal Systems

| Torsten Hauck | Vibhash Jha | NXP Semiconductors |

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Package level thermo-mechanical assessment — Session 7

16:30  Monday March 25 2019
Salon 4  Chaired by Tamara Bechtold and Karsten Meier

16:30  Prediction of robustness of packages by cohesive zone finite element simulation and verification by non-destructive tests
Reinhard Pufall 1, Daniel May 2, Bernhard Wunderle 2, Georg M. Reuther 1, Nadine Pflügler 1, Dominik Udiljak 1
1 Infineon Technologies AG, Am Campeon 1-15, 85579 Neubiberg, Germany
2 Technische Universität Chemnitz, Reichenhainer Str. 70, 09126 Chemnitz, Germany

17:00  Advanced Mixed-Mode Bending Test: Influence of the Surface Topography on the Fracture Behaviour of an EMC to Copper Lead Frame Bi-Material Interface
M. Schulz 1, R. Mroßko 1, B. Wunderle 2, M. Abo Ras 1
1 AMIC Angewandte Micro-Messtechnik GmbH
2 Chemnitz University of Technology

17:20  Package Level Warpage Simulation of a Fan Out System in Board Module
M. Frewein 1, T. Krivec 1, Q. Tao 1, J. Zündel 1, J. Rosc 2, M. Gschwandl 3, Peter F. Fuchs 3
1 ATS - Austria Technologie und Systemtechnik Aktiengesellschaft, Leoben, Austria
2 Materials Center Leoben Forschungs GmbH, Leoben, Austria
3 Polymer Competence Center Leoben GmbH, Leoben, Austria

17:40  Numerical estimation of local load during manufacturing process in high temperature PCB resins based on viscoelastic material modelling
Michael Schmidt 1, Youssef Maniar 1, Alexander Kabakchiev 1, Roumen Ratchev 1, Michael Guyenot 1, Hans Walter 2, Martin Schneider-Ramelow 3
1 Robert Bosch GmbH, Corporate Sector Research and Advance Engineering, Renningen, Germany
2 Fraunhofer IZM, Department System Integration and Interconnection Technologies, Berlin, Germany
3 Technical University of Berlin, Faculty IV – Electrical Engineering and Computer Science, Germany

18:00  Material Model and Simulation of Multilayer-AgSn-Foils for Transient-Liquid-Phase Bonding of Sensor Elements
Markus Feißt, Cong Li, Jürgen Wilde, University of Freiburg - IMTEK, Department of Microsystems Engineering, Laboratory of Assembly and Packaging

19:00  Dinner downtown
08:30 Accelerated Pump Out Testing for Thermal Greases

30mn

B. Wunderle 1, D. May 1, J. Heilmann 1, J. Arnold 1, J. Hirscheider 1, Y. Li 1, J. Bauer 2, R. Schacht 3, M. Abo Ras 4

1 TU Chemnitz, Germany
2 Fraunhofer IZM, Berlin, Germany
3 BTU Cottbus, Germany
4 Berliner Nanotest

09:00 Automated Method Using Finite Element Simulation to Identify Microvia Stacks at Risk of Separation in Complex PCB Designs

20mn

Kourosh Kalayeh, Natalie Hernandez, Craig Hillman, David Dang, Nathan Blattau, DfR Solutions, Beltsville, MD, USA

09:20 Layout Optimization for CMOS Interconnects for Heating, Cooling and Improved Stress Distribution

20mn

Verena Hein 1, Kirsten Weide-Zaage 2, Xi Yang 2

1 X-FAB Semiconductor Foundries AG, Erfurt Germany
2 RESRI Group, Institute of Microelectronic Systems (IMS), Leibniz Universität Hannover, Germany
# Thermal Modelling and Characterization — Session 9

**08:30 Tuesday March 26 2019**  
Salon 4  
Chaired by Marcus Schulz and Mahdi Sadeghinia

<table>
<thead>
<tr>
<th>Time</th>
<th>Title</th>
<th>Authors</th>
<th>Institution(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>08:30</td>
<td>The effect of the thermal conductivity of room-temperature-vulcanizing</td>
<td>Noriyuki Unno, Kazuhisa Yuki, Risako Kibushi</td>
<td>Sanyo-Onoda City University, Japan</td>
</tr>
<tr>
<td></td>
<td>silicone used for boiling heat transfer</td>
<td></td>
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<tr>
<td>09:00</td>
<td>Measurement and Simulation of Test Structures Dedicated to the</td>
<td>Marcin Janicki, Jedrzej Topilko, Artur Sobczak, Piotr Zajac, Piotr Pietrzak, Andrzej Napieralski</td>
<td>Lodz University of Technology</td>
</tr>
<tr>
<td></td>
<td>Investigation of Heat Diffusion at Nanoscale</td>
<td></td>
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<tr>
<td>09:20</td>
<td>Migration of flow induced hotspot with heat spreader integrated</td>
<td>G Narendran, N Gnanasekaran, D Arumuga Perumal</td>
<td>National Institute of Technology</td>
</tr>
<tr>
<td></td>
<td>microchannel subjected to asymmetric hot spots: A multiphysics</td>
<td></td>
<td>Karnatak, Surathkal, India</td>
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<tr>
<td></td>
<td>approach</td>
<td></td>
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<tr>
<td>09:40</td>
<td>New Method to Determine the Local Joule Heat Distribution in Fast</td>
<td>Christian Römelsberger, Martin Hanke</td>
<td>CADFEM GmbH</td>
</tr>
<tr>
<td></td>
<td>Switching Device</td>
<td></td>
<td></td>
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</tbody>
</table>
Session 10 — Solid State Lighting

Tuesday March 26 2019 08:30
Chaired by Geneviève Martin and Bernd Schwarz Salon 2-3

08:30  Solder interconnect degradation with irregular joint shape
30mn

X.J. Zhao 1, H. De Vries 1, R. Engelen 1, P. Watté 2, G. van Hees 1

1 Signify (Philips Lighting) Research, Eindhoven, The Netherlands
2 Signify LED Electronics, Eindhoven, The Netherlands

09:00  Lifetime Prediction of Ultraviolet light-emitting diodes with accelerated
        Wiener degradation process
20mn

Zhou Jing 1, Mesfin Seid Ibrahim 2, Jiajie Fan 1, Xuejun Fan 3, Guoqi Zhang 4

1 College of Mechanical and Electrical Engineering, Hohai University, Changzhou 213022, China
2 Department of Industrial and System Engineering, The Hong Kong Polytechnic University, Hung Hom, Hong Kong
3 Department of Mechanical Engineering, Lamar University, Beaumont, TX 77710, USA
4 EEMCS Faculty, Delft University of Technology, Delft 2628, the Netherlands

09:20  Modelling Thermo-mechanical Stress in GaN-LEDs Soldered on Copper
        Substrate with simulations validated by Raman experiments
20mn

Fosca Conti 1, Raffaella Signorini 1, Enrico Brugenolotto 1, Gordon Elger 2, Sri Krishna Bhogaraju 2, E Liu 2

1 Department of Chemical Sciences, University of Padova, Italy
2 Institute of Innovative Mobility, Technische Hochschule Ingolstadt, Germany

09:40  Failure Identification in LED packages by Transient Thermal Analysis and
        Calibrated FE Models
20mn

Alexander Hanss, E Liu, Muhammad Rizwan Abdullah, Gordon Elger, Institute for
        Innovative Mobility, Technische Hochschule Ingolstadt

10:20  Coffee break
Dialog session (posters) — Session 11

10:20 Tuesday March 26 2019
Boardroom Chaired by Sven Rzepka and Mike Röllig. Vote for best poster.

**Numerical Simulation of Top Metal Thickness on IMD Stress due to Probing**

PID 8

Raj Sekar Sethu, Lars Bergmann, Marco Erstling, Peter Lammert, Angela Fahr, Hansika Jayawardana

1 X-FAB Semiconductor Foundries AG, Kuching Sarawak, Malaysia
2 Swinburne University of Technology Sarawak, Kuching Sarawak, Malaysia

**Determination of BEOL Aluminum-Copper Constitutive Equation using FEA Simulation and Response Surface Methodology**

PID 9

Verena Hein, Raj Sekar Sethu, Hansika Jayawardana, Kok Heng Soon, Almon We-Yen Chai

1 X-FAB Semiconductor Foundries AG, Erfurt, Germany
2 X-FAB Semiconductor Foundries AG, Kuching, Malaysia
3 Swinburne University of Technology Sarawak Campus, Kuching, Malaysia

**Electromigration Effects in Corroded BGA**

PID 11

Kirsten Weide-Zaage, Alexandrine Guédon-Gracia, Hélène Frémont

1 RESRI Group, Institute of Microelectronic Systems (IMS), Leibniz Universität Hannover, Hannover, Germany
2 Laboratoire IMS, CNRS UMR 5218, Université de Bordeaux, Talence, France

**High Power Terminal Vibrational Analysis in Response to Experimental Qualification Results**

PID 13

Matt Packwood, Daohui Li, Paul Mumby-Croft, Xiang Li, Dynex Semiconductor, Lincoln, United Kingdom

**A SPICE-based Transient Thermal-Electronic Model for LEDs**

PID 27

Bo Sun, Guangdong University of Technology
Jiajie Fan, Hohai University
Xuejun Fan, Lamar University
Guoqi Zhang, Delft University of Technology
Electrical and optical characterization of MoS2 thin film transistors and the effect of strain on their performances

Zuopeng Qu, Hongyu Tang, Huaiyu Ye, Xuejun Fan, Guoqi Zhang
1 Renewable Energy School, North China Electric Power University, Beijing, China
2 Delft Institute of Microsystems and Nanoelectronics, Delft University of Technology, Delft, The Netherlands
3 Key Laboratory of Optoelectronic Technology and Systems, Education Ministry of China, Chongqing University, Chongqing, China
4 Department of Mechanical Engineering, Lamar University, Beaumont, Texas, USA

Online prognostication of remaining useful life for random discharge lithium-ion batteries using a gamma process model

Zeyu Wu, Zili Wang, Cheng Qian, Bo Sun, Yi Ren, Qiang Feng, Dezhen Yang
School of Reliability and Systems Engineering, Beihang University, Beijing, China

Comparison of the thermal-mechanical behavior of a soldered stack influenced by the choice of the solder

Vargas Ramiro, Gonda Viktor
Obuda University

Numerical and experimental study of a novel body-mounted piezoelectric energy harvester based on synchronized multi-magnet excitation

Arunas Kleiva, Rolanas Dauksevicius
Kaunas University of Technology, Kaunas, Lithuania

Modelling and Simulation of Glass Frit Bonding of Silicon Wafers

Seyed Amir Fouad Farshchi Yazdi, Matteo Garavaglia, Aldo Ghisi, Alberto Corigliano
1 Politecnico di Milano, Milan, Italy
2 ST Microelectronics, Agrate Brianza, Italy

Analytical modelling of MEMS Z-axis comb-drive accelerometer

Cezary Maj, Michal Szermer, Piotr Zajac, Piotr Amrozik
Lodz University of Technology

Coupled Electro-mechanical Simulation of Capacitive MEMS Accelerometer for Determining Optimal Parameters of Readout Circuit

Piotr Zajac, Michal Szermer, Piotr Amrozik, Cezary Maj, Grzegorz Jablonski
Lodz University of Technology

Warpage Behavior Analysis of Semiconductor Package Including Chip

Kento Kariya, Naoaki Tsurumi, Takuji Maekawa, Mitsuru Morimoto, Noriyuki Masago
Research and Development Center, ROHM Co., Ltd. Kyoto, Japan
Design for Package Miniaturization for a MEMS Pressure Sensor

PID 104

Roseanne Duca, STMicroelectronics Malta (Ltd)
Marco Omar Ghidoni, STMicroelectronics Italy (Ltd)

Degradation of Bisphenol-A-polycarbonate (BPA-PC) Optical Lenses under Simulated Harsh Environment Conditions

PID 109

Maryam Yazdan Mehr, Willem van Driel, Kouchi Zhang, EEMCS Faculty, Delft University of Technology, The Netherlands

12:30 Lunch
**Session 12 — Electronics reliability under vibration loadings**

**Tuesday March 26 2019 14:00**

Chaired by Ehmad Poshtan and Susan Zhao  
Salon 5-6

**14:00**  
30mn  
**Effect of Nonlinear Interactions of Electronic Assemblies in Response to Multiaxial Vibration Excitation**  
Xiao Lin, Abhijit Dasgupta. *University of Maryland, College Park, United States.*

**14:30**  
20mn  
**Effect of Material properties and Boundary condition on PCB frequencies in electronic control unit**  
Mahdi Sadeghinia ¹, Chalukya Chincholi ², Alexander Udyansky ³, Andreas Fischer ¹  
¹ Robert Bosch GmbH  
² Robert Bosch Engineering and business solutions private limited-India  
³ Bosch Automotive Products (Suzhou) Co. Ltd-China

**14:50**  
20mn  
**Harmonic Vibration Durability Tests on Lead-Free Solder Joints at Different Isothermal Conditions**  
Karsten Meier ¹, David Leslie ², Tamara Storz ², Abhijit Dasgupta ², Karlheinz Bock ¹  
¹ Technische Universität Dresden, Institute of Electronics Packaging Technology, Dresden, Germany  
² Center for Advanced Life Cycle Engineering (CALCE), Mechanical Engineering Department, University of Maryland, College Park, USA
Multiphysics / Scale analysis - including — Session 13
moisture, electromigration, etc.
14:00 Tuesday March 26 2019
Salon 4  Chaired by Bart Vandevelde and Gordon Elger

14:00 Resistor-Capacitor Approach for Modelling of Temperature and Humidity Response Inside Electronic Enclosures
30mn
Zygimantas Staliulionis ¹, Sankhya Mohanty ², Jesper Henri Hattel ²
¹ FORCE Technology, Product Compliance, Hørsholm, Denmark
² Process Modelling Group, Department of Mechanical Engineering, Technical University of Denmark, Lyngby, Denmark

14:30 Computational Mechanics for Flexible and Wearable Electronics
20mn
Zhuangjian Liu, Institute of High Performance Computing, A*STAR Research Entities

14:50 Application of Artificial and recurrent neural network on the steady-state and transient finite element modeling
20mn
Cadmus Yuan ¹, Yu-Jun Hong ¹, Chang-Chi Lee ¹, Kou-Ning Chiang ², Jin-Huang Huang ¹
¹ Department of Mechanical and Computer-aided Engineering, Feng Chia University, Taichung, Taiwan
² Department of Power Mechanical Engineering, National Tsing Hua University, Hsinchu, Taiwan

15:15 Coffee break
Automatic assembly of multiscale models and its application to a family of homogenized models of wave propagation through interfaces having a periodic structure
Michel Lenczner, Walid Belkhir, Nicolas Ratier, Nhat Binh Trinh, Bruno Cavallier, FEMTO-ST Institute, University of Bourgogne Franche-Comté

Simulation Methodology for Active Semiconductor Devices in MEMS
Mike Schwarz, Volkmar Senz, Arne Dannenberg, Wolfgang Feiler, Friedjof Heuck, Thomas Friedrich, Christian Sorger, Jochen Franz, Robert Bosch GmbH

Simulation-Based Design of an Electrostatically Driven Microactuator for Fluid Transport in Mobile Applications
M. Seidl¹, M. Gehring¹, U. Krumbein², G. Schrag¹
¹ Chair for Physics of Electrotechnology, Technical University of Munich, Munich, Germany
² Infineon Technologies AG, Neubiberg, Germany

Reconstructing mid-air acoustic holograms using PMUT arrays: a simulation study
Hang Gao, Pieter Gijsenbergh, Shengping Mao, Alexandre Halbach, Yongbin Jeong, David Cheyns, Xavier Rottenberg, Véronique Rochus, Imec, Leuven, Belgium

Modelling, Simulations and Performance Analysis of MEMS vibrating Gyroscope in Coventor MEMS Environment
Jacek Nazdrowicz, Andrzej Napieralski, Lodz University of Technology, Lodz, Poland
## EU projects — Session 15

**15:45 Tuesday March 26 2019**  
**Salon 5-6**  
**Chaired by Kirsten Weide-Zaage**

<table>
<thead>
<tr>
<th><strong>15:45</strong> Delphi4LED EU project</th>
<th>30mn</th>
</tr>
</thead>
<tbody>
<tr>
<td><a href="#">Genevieve Martin</a>, Signify, Eindhoven, The Netherlands</td>
<td></td>
</tr>
</tbody>
</table>

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<thead>
<tr>
<th><strong>16:15</strong> TRACE EU project</th>
<th>30mn</th>
</tr>
</thead>
<tbody>
<tr>
<td><a href="#">Rainer Dudek</a>, Fraunhofer ENAS, Dept. MMC, Chemnitz, Germany</td>
<td></td>
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<thead>
<tr>
<th><strong>16:45</strong> EuroPAT-MASIP</th>
<th>30mn</th>
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<td><a href="#">Sven Rzepka</a>, Fraunhofer Institute for Electronic Nano Systems, Chemnitz, Germany</td>
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<tr>
<th><strong>17:15</strong> IoSense EU project</th>
<th>30mn</th>
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<td><a href="#">Willem van Driel</a>, Signify (Philips Lighting), Eindhoven, The Netherlands</td>
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Session 16 — High power applications

Tuesday March 26 2019 15:45

Chaired by Kaspar Jansen and Hélène Frémont

15:45 Vacancy Transport, Mechanical Stress, and Self-Diffusion under Electromigration
30mn

Xuejun Fan 1, Zhen Cui 2, Kasemsak Kijkanjanapaiboon 1, G.Q. Zhang 2
1 Department of Mechanical Engineering, Lamar University, Beaumont, USA
2 Department of Microelectronics, Delft University of Technology, The Netherlands

16:15 Simulative Comparison of Polymer and Ceramic Encapsulations on SiC-MOSFET Power Modules under Thermomechanical Load
20mn

Felix Wagner 1, Youssef Maniar 1, Martin Rittner 1, Stefan Kaessner 1, Michael Guyenot 2, Lukas Lang 1, Bernhard Wunderle 2
1 Robert Bosch GmbH, Corporate Research and Advance Engineering, Renningen, Germany
2 TU Chemnitz, Institute for Materials and Reliability of Microtechnology Systems, Chemnitz, Germany

16:35 Micro Bending Test on Double Cantilever Beams: A specimen-centred approach to accurate determination of the visco-plastic properties of Sintered Silver for Power Electronics applications
20mn

Uwe Zschenderlein 1, Markus Klingler 2, Jörg Arnold 2, Mario Baum 3, Marie Weißbach 3, Marco Schaal 2, Bernhard Wunderle 1
1 Chemnitz University of Technology, Chemnitz, Germany
2 Robert Bosch GmbH Reutlingen, Germany
3 Fraunhofer Institute ENAS, Chemnitz, Germany

16:55 Methodology for Correlation of Porosity and Mechanical Properties of Silver Sintered Joints in Electronics
20mn

R. Metasch 1, M. Roellig 1, P. Knoch 1, C. Weinmann 1, K. Meier 2
1 Fraunhofer Institute for Ceramic Technologies and Systems
2 Technische Universität Dresden, Institute of Electronic Packaging Technology

Exhibitor and Sponsor special session

Salon 5-6

18:00 Tuesday March 26 2019

Chaired by Willem van Driel

18:00 Bosch / CADFEM / Dynardo / FRT-CWM / Huawei / Siemens

19:15 Dinner-cocktail party at venue, until 21h15
19:45 The EuroSimE Steering Committee is open to anybody. Among the addressed topics, it will select the local organiser and city where to hold EuroSimE 2020 (please prepare pitch)
Session 17 — Technical keynotes - II

Wednesday March 27 2019 08:30

Chaired by Bernhard Wunderle and Maryam Yazdan Mehr  Salon 4

08:30  Air-coupled array of PMUTS at 100 kHz with PZT Active Layer: Multiphysics Model and Experiments

30mn

Gianluca Massimino 1, Alessandro Colombo 1, Raffaele Ardito 1, Fabio Quaglia 2, Francesco Foncellino 3, Alberto Corigliano 1

1 Department of Civil and Environmental Engineering, Politecnico di Milano, Italy
2 Analog, MEMS and Sensors Group, ST Microelectronics, Cornaredo, Italy
3 AMS, RnD Group, ST Microelectronics, Arzano, Italy

09:00  Modeling Based Development and Challenges of Key Electronic Manufacturing Chain Equipment

30mn

Sheng Liu, Zhiyin Gan, Bin Gao, Institute of Technological Sciences, Wuhan University, China

09:30  Reliability of electronic materials when subjected to aging conditions

30mn

Mohammad Motalab, Bangladesh University of Engineering and Technology (BUET), Dhaka, Bangladesh
Munshi M. Basit, Georgia Southern University, Statesboro, GA, USA
Jeffrey C. Suhling, Auburn University, Auburn, AL, USA

Awards ceremony

10:00  Wednesday March 27 2019  Salon 4

Chaired by Sven Rzepka

10:00  Best and outstanding papers and posters

10:30  Coffee break
IC level thermo-mechanical analysis — Session 18

11:00 Wednesday March 27 2019
Salon 4  Chaired by Reinhard Pufall and Cheng Qian

11:00 Simulations in Terms of Radiation Effects on different BEOL Material Systems
30mn
Kirsten Weide-Zaage 1, Guillermo Paya-Vaya 2, Philemon Eichin 1
1 RESRI Group, Institute of Microelectronic Systems (IMS), Leibniz Universität Hannover
2 AS, Institute of Microelectronic Systems (IMS), Leibniz Universität Hannover

11:30 BEOl Cracking Risks due to Manufacturing Introduced Residual Stresses
20mn
Juergen Auersperg 1, Ellen Auerswald 2, Dietmar Vogel 2, Sven Rzepka 2
1 Micro Materials Center at Fraunhofer ENAS, Chemnitz and Berliner Nanotest und Design GmbH, Berlin und Chemnitz, Germany
2 Micro Materials Center at Fraunhofer ENAS, Chemnitz, Germany

11:50 Study of wafer warpage for Fan-Out wafer level packaging: finite element modelling and experimental validation
20mn
Abdellah Salahouelhadj, Mario Gonzalez, Kris Vanstreels, Arnita Podpod, Alain Phommahaxay, Kenneth June Rebibis, Eric Beyne, IMEC, Leuven, Belgium

12:10 Characterization of Stochastically Distributed Voids in Sintered Nano-Silver Joints
20mn
Zhongchao Sun, Zili Wang, Cheng Qian, Yi Ren, Qiang Feng, Dezhen Yang, Bo Sun, Beihang University
Session 19 — Advanced experimental analysis techniques

Wednesday March 27 2019 11:00

Chaired by Michel Lencznier and Xuejun Fan  
Salon 2-3

11:00 Direct Measurements of Underfill Local Strain Using Confocal Microscopy and Digital Image Correlation

Ying Yang, Papa Momar Souare, Julien Sylvestre, Institut Interdisciplinaire d’Innovation Technologique (3iT), University of Sherbrooke, Canada

11:30 Plastic deformation and failure modes of moulding compounds during indentation loading and their importance for the quantitative characterisation of adhesion

Nadine Pflügler 1, Georg M. Reuther 1, Michael Goroll 1, Reinhard Pufall 1, Bernhard Wunderle 2
1 Infineon Technologies AG, Neubiberg, Germany
2 Technische Universität Chemnitz, Chemnitz, Germany

11:50 Measurements and Simulations of the Creep Strain in Flip Chip Dies

Florian Schindler-Saefkow 1, Florian Rost 2, Sven Rzepka 1
1 Fraunhofer ENAS, Micro Materials Center, Chemnitz, Germany
2 TU Chemnitz, Germany

12:10 Warpage Investigation of PCB Embedding Technology – Determination of Relevant Modelling Parameters by Means of FEM and Experiments

Florian Rost 1, Saskia Huber 1, Hans Walter 1, Marius van Dijk 1, Thomas Cramer 2, Johannes Jaeschke 1, Olaf Wittler 1, Martin Schneider-Ramelow 3
1 Fraunhofer Institute for Reliability and Microintegration (IZM), Berlin, Germany
2 ILFA Industrielektronik und Leiterplattenfertigung aller Art GmbH, Hannover, Germany
3 Technische Universität Berlin, Berlin, Germany

12:30 Lunch

Visit of Robert Bosch plant of Salzgitter

13:30 Wednesday March 27 2019
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<tr>
<td>13:30</td>
<td>Departure by bus from venue</td>
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<td>16:30</td>
<td>Return to venue</td>
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