

26<sup>th</sup> European Symposium on  
Reliability of Electron Devices,  
Failure Physics and Analysis

October 5-9, 2015,  
Centre de congrès P. Baudis,  
Toulouse (France)



**2<sup>nd</sup> CALL FOR PAPERS – Extended Deadline: March 25, 2015**

**ESREF 2015**, the 26<sup>th</sup> European Symposium on Reliability of Electron Devices, Failure Physics and Analysis, will take place in Toulouse (France) from 5<sup>th</sup> to 9<sup>th</sup> October 2015 at *Centre de Congrès Pierre Baudis* (11 esplanade Compans Caffarelli).

This international symposium continues to focus on recent developments and future directions in Quality and Reliability Management of materials, devices and circuits for micro-, nano-, and optoelectronics. It provides a European forum for developing all aspects of reliability management and innovative analysis techniques for present and future electronic applications.

**A word from the conference chairs:** *For this 26<sup>th</sup> edition, in addition to the core topics of the conference, we would like to involve the major actors of aeronautics, space and embedded systems industry to provide specific topics such as radiation hardening, very long-term reliability, high/low temperature challenges, obsolescence and counterfeit issues, wide bandgap power devices for the more electric aircraft and other embedded system applications. In the continuity of previous conferences, ESREF 2015 is also hosting several workshops (EFUG, EUFANET, POWER...) and welcomes new ones related to these specific topics. We are looking forward to welcoming you for a memorable experience!* Marise BAFLEUR and Philippe PERDU

**SCOPE OF PAPERS**

Papers are solicited on the following topics:

**A: Quality and Reliability Assessment – Techniques and Methods for Devices and Systems** - The main topics focus on methodologies, which have been developed to improve the quality and reliability during development, manufacturing and implementation processes of components, devices, boards and even systems. All methods and tools developed to improve quality or assess reliability at components, devices, boards level are relevant to this topic, as well as systems. Of course, studies dedicated to topics, which improve the pure knowledge of quality evaluation and reliability assessment, even without direct application are also relevant.

**B1: Si Technologies & Nanoelectronics: Hot carriers, high K, gate materials** - Papers describing new insights into behavior of transistor degradation mechanisms such as hot carrier interactions, dielectric breakdown, and bias-temperature instabilities, including SiON and high-k based devices. Your abstract should advance the state of the art in understanding and modeling the dependence on materials, device design, or use conditions.

**B2: Si Technologies & Nanoelectronics: Low K, Cu Interconnects** - The session covers all topics on silicon technologies and nanoelectronics with respect to Cu-interconnects and low-k material. It ranges from reliability, robustness, stress testing like electromigration, failure mechanisms and methods to reveal root causes. It covers also Modeling and simulation research activity in the field. Contributions from industry and academics are welcome.

**B3: Si Technologies & Nanoelectronics: ESD, Latch-up, Radiation Effects** - With the steady increase of the technology scale down, reliability of electronics embedded application is becoming a challenge. Thus, this session is devoted on harsh environment, typically on Electro Static Discharge (ESD), Latch- Up and Radiation events and impacts. Proposals will be on new results and advanced studies with a highlight on major achievements. Focus could be on simulation, devices, measurements and demonstrators in mature and advanced technologies.

**C: Failure Analysis** - The main topics focus on advanced new techniques, challenging applications, innovative case studies on reliability and on failure physics with respect to analysis of materials, devices, and circuits for micro, nano, and optoelectronics.

**D1: Microwave and Power Wide Bandgap Devices** - The main topics are dealing with the specific mechanisms being relevant for wide band gap material and devices. Of interest are reports and analysis of dedicated processes arising from the special nature of the today's main subjects like GaN and SiC as well as new candidates in this material area. It should be directed, but not limited to special high switching speed mechanisms, aspects arising from the hetero epitaxial structure of GaN, dedicated high temperature effects but also the extension resp. adaption of failure models from the established materials like silicon towards the new materials. Finally, dedicated studies about the behavior of wide band gap materials under harsh environments and related degradation phenomena are highly welcome.

**D2: Photonic Devices** - The main topics focuses on reliability, characterization and failure physics of both active and passive optoelectronic devices: emitters (Laser and LEDs), detectors and receivers, and optoelectronic systems. The reliability issues for extending photonics to harsh environment, such as aerospace, will complement the challenges that high speed communication and domestic, industrial and urban lighting continuously propose.

**D3: Photovoltaic & Organic Devices** - Papers are expected in the field of reliability, stability, analysis and modeling of failure mechanisms of: Organic electronic devices (Organic-Thin-Film-Transistors, Organic Emitting Diodes, Organic Light Emitting Transistors, Organic sensors and Bio-Sensors, Organic Memories, etc.) - Organic dielectrics (analysis of charge trapping, stress induced leakage currents and breakdown of organic dielectrics, etc.) - Organic-based or flexible displays and/or pixel drivers - Solar cells (conventional, thin-film silicon, organic, dye-sensitized and perovskite solar cells, etc.).

**E1: Packages & Assembly** – The main topics address reliability and failure analysis of all sort of packages and assemblies: wires, solder/adhesive joints, interposers, TSV, materials etc.

**E2: MEMS, MOEMS, NEMS & Nano-objects**

The aim of the session is to provide new information on the failure mechanisms of MEMS, MOEMS and NEMS. The modeling of the degradation mechanisms is essential to be addressed for the lifetime prediction of these devices. The induced dielectric charging as well as the one due to charge injection during actuation and the field emission are key issue parameters that directly affect the failure of MEMS capacitive switches and MOEMS. The contact degradation mechanisms due to high electric field or current, the impact of ambient contamination and the mechanical wear out during actuation are important failure mechanisms for ohmic switches. Experimental results or modeling on the reliability of NEMS constitute a key issue parameter for the lifetime prediction of these devices. Finally process induced failure mechanisms can be also addressed.

**F: Power Devices**

The main topics focus on the various techniques for improving the robustness and reliability of silicon power components including passive elements and in particular: components such as IGBTs, MOSFETs, diodes, smart power devices, power modules, drivers, and passive power devices - power device simulation approaches - thermal management of devices and components including modeling, simulation and testing - cooling technologies - packaging technologies for high power, high temperature and high voltage devices and components - power specific joining, like die attach (silver sintering, diffusion soldering,...), bond wires, terminals,... - lifetime modeling, simulation and testing.

**G: Space, Aeronautic and Embedded Systems** - The technical scope includes papers dealing with reliability at hardware and/or software levels, EMC,

This also includes the associated system level mitigations. Another important part will be related to papers on guidelines, methodologies, standards and safety analysis. Key topics are: Reliability at system level - EMC, immunity to electrical transients and radiation tolerance seen from the system level perspective - Safety analysis - Fault and failure propagation in systems - Fault tolerant and fail safe architectures - Guidelines, methodologies and standards - On-line and off-line testing for Systems-on-Chip (SoC) - Circuits and system counterfeit detection & avoidance.

**H: European FIB User Group (EFUG)** - Contributions for the EFUG-FIB session should focus on semiconductor applications of Focused Ion Beams and related system developments and methodologies. Topics include: circuit edit (application procedures, new gas chemistries), dedicated FIB procedures for nanoprobe and failure analysis, FIB process monitoring for wafer manufacturing, in-line FIB and wafer return, new FIB instrumentation (HIM, Plasma-FIB, Laser preparation tools, ...), efficient preparation workflows (automated TEM preparation, atom probe sample preparation).

## TECHNICAL PROGRAM

**Tutorials** by experts will provide review presentation of relevant topics and **Invited papers** will introduce the mainstream topics.

**Workshops** organized in correlation with the ESREF conference will give the opportunity to exchange the know-how and field returns on specific topics. For further information concerning the Scientific Program, please contact: [event@esref2015.org](mailto:event@esref2015.org)

**Exhibition** - The Symposium will feature the latest in service providers, equipment manufacturers and suppliers in these fields.

You can enjoy early signups (Fall 2014) and early bird (up to June 2015) discounts. For further information concerning the equipment exhibition, please contact: [expo@esref2015.org](mailto:expo@esref2015.org).

**Sponsor** the event and get advantages of sponsor packages (platinum, gold and silver). Combine sponsorship with early sign up at exhibition and get impressive discounts and advantages. For further information concerning the sponsoring, please contact: [sponsor@esref2015.org](mailto:sponsor@esref2015.org).

## TECHNICAL PROGRAM COMMITTEE

### Topic A: **Quality and Reliability Assessment**

N. D. STOJADINOVIC, University of Nis (Serbia)  
B. FOUCHER, AIRBUS GROUP INNOVATIONS (F)

### Topic B1: **Hot carriers, high K, gate materials**

A. BRAVAIX, ISEN-IM2PN (F)  
J. STATHIS, IBM Research (USA)

### Topic B2: **Low K, Cu Interconnects**

H. JAOUEN, STMicroelectronics (F)  
E. LANGER, Globalfoundries (D)

### Topic B3: **ESD, Latch-up, radiation effects**

P. GALY, STMicroelectronics (France)  
F. CAIGNET, LAAS-CNRS (France)  
V. VASSILEV (NOVORELL Technologies - USA)

### Topic C: **Failure Analysis**

R. HEIDERHOFF, Bergische Universität Wuppertal (D)  
O. CREPEL, AIRBUS GROUP INNOVATIONS (F)  
S. GOERLICH, INFINEON (D)  
F. BEAUDOIN, Globalfoundries (USA)

### Topic D1: **Microwave and Power Wide Band-gap Devices**

G. MENEGHESSO, University of Padova (I)  
N. LABAT, IMS, University Bordeaux (F)  
P. FRIEDRICH, INFINEON (D)

### Topic D2: **Photonic Devices**

M. VANZI, University of Cagliari (I)  
M. MENEGHINI, University of Padova (I)

### Topic D3: **Photovoltaic & Organic Devices**

N. WRACHIEN, University of Padova (I)

### Topic E1: **Packages & Assembly**

K. WEIDE-ZAAGE, University of Hannover (D)  
G. DUCHAMP, IMS, University Bordeaux (F)

### Topic E2: **MEMS, MOEMS, NEMS & Nano-objects**

G. PAPAIOANNOU, University of Athens (GR)  
F. COCCETTI, Elemca (F)

### Topic F: **Power Devices**

P. TOUNSI, INSA, LAAS-CNRS (F)  
E. WOLFGANG, ECPE (D)

### Topic G: **Space, Aeronautic and Embedded Systems**

S. BEN DHIA, INSA, LAAS-CNRS (F)  
F. VARGAS, Catholic University - PUCRS (BR)  
A. DURIER, IRT Saint-Exupéry (F)  
F. MILLER, AIRBUS GROUP INNOVATIONS (F)

### Topic H: **European FIB User Group (EFUG)**

H. BENDER, IMEC (BE)  
F. ALTMANN, Fraunhofer IWM Halle (D)  
H. CHAUVIN, Thales Group (F)

## ORGANIZING COMMITTEE

### Conference Chair & Vice-Chair:

M. BAFLEUR LAAS-CNRS (France)  
P. PERDU CNES (France)

### Technical Program Chairs:

F. MARC IMS, University of Bordeaux (France)  
H. FREMONT IMS, University of Bordeaux (France)

### Tutorial Chair:

P. JACOB EMPA (Switzerland)  
G. BUSATTO University of Cassino (Italy)

### Event Committee Chair:

A. BENSOUSSAN IRT Saint Exupéry (France)  
A. DURIER IRT Saint Exupéry (France)

### Workshop Chair:

M. CIAPPA ETH (Switzerland)

### Conference Scientific Support:

C. BOIT TU Berlin (Germany)  
F. FANTINI University of Modena (Italy)

### Industrial Exhibition:

J. GAUDESTAD NEOCERA (USA)  
B. DUCROCQ LAAS-CNRS (France)

### Publicity Chair:

J. TOUZEL INFINEON (Germany)  
E. MIRANDA University Autonoma Barcelona (Spain)

### ESREF Scientific support in TURKEY

I. BAYLAOGLU SATURN Consulting (Turkey)

### Journal Edition Chairs:

M. BAFLEUR LAAS-CNRS (France)  
P. PERDU CNES (France)

### Organization Secretariat:

A. DE SOUSA BERDAT LAAS-CNRS (France)

### Webmaster:

D. TREMOUILLES LAAS-CNRS (France)

To contact ESREF 2015: [contact@esref2015.org](mailto:contact@esref2015.org)

## SUBMISSION GUIDELINES AND DEADLINES

The deadline for the submission of the **four-page extended** summary is **March 16, 2015**. Authors will find a paper template and submission guidelines for the electronic file uploading in the **Author's Corner** of the conference website: <http://www.esref.org>.

**30 April 2015** Notification of acceptance  
**25 May 2015** Submission of extended paper

Elsevier Ltd will publish the ESREF 2015 proceedings as a special issue of the Microelectronics Reliability journal. Publication will have to go through the journal reviewing procedure.

**30 June 2015** Upload of final paper to the online Elsevier Editorial System (EES)

organized by:



with the technical co-sponsorship of:

