



ADVANCED PROGRAM AND REGISTRATION FORM

16th European Advanced Technology Workshop on Micropackaging and Thermal management

8 & 9 March 2023



HOTEL MERCURE POITIERS SITE DU FUTUROSCOPE

2 Avenue Jean Monnet

Téléport 3 – BP 50190

86962 FUTUROSCOPE – CHASSENEUIL CEDEX,
France

tel. +33 (0)5 49 49 55 05

Email: h2773-SB@accor.com

Hotel reservations will be made by
the organizing committee

Workshop arrival day:
Tuesday, 7 March 2023

First ENSMA Thermal Lab Tour
(5:30 pm – 7:00 pm)



WORKSHOP COMMITTEE:

Conference chairmen:

France:

Jean-Yves SOULIER (Safran Data Systems)

Jean-Pierre FRADIN (ICAM Toulouse)

Bruno LEVRIER (BL Expertises)

Alexandre VAL (Valeo)

Technical Program Committee:

France:

Vincent AYEL (Institut PPRIME - ENSMA Poitiers)

Jacques FAVRE (aPSI^{3d})

Sandrine LELONG-FENEYROU (Safran Data Systems)

Raphael SOMMET (XLIM Limoges)

Germany:

Mohamad ABO RAS (BERLINER NANOTEST)

Thomas HARDER (ECPE)

USA:

Dave SAUMS (DS&A LLC)

Thermal management remains a crucial constraint in electronics packaging and is a mandatory aspect in every industry – aerospace, automotive, consumer, industrial, military - technology roadmap worldwide.

The upcoming workshop will present some latest improvements in thermal management solutions at system level, in power electronics, in materials, in modelling and in techniques for characterizing and testing materials. It will also present some innovative cooling solutions such as two-phase technologies and liquid cooling.

♥ Final Registration ends on 6 March 2023

Organized by:

International Microelectronics Assembly and Packaging Society France

17 rue de l'Amiral Hamelin 75016 Paris, France

E-mail : imaps.france@orange.fr

CONFERENCE SCHEDULE

8 March 2023 (Wednesday)

09.00 am

Opening address & table tops presentation
Jean-Yves Soulier, Conference chairman & IMAPS France Treasurer

SESSION 1: ACTIVE & PASSIVE TWO-PHASE COOLING

Chairs: Bruno Levrier (BL Expertises) / Jean-Yves Soulier (Safran Data Systems)

09.15 am

Enhanced Two-Phase and Air-Side Thermal Management
Thomas Boziuk, Sourabh Jha, and Ari Glezer
(Georgia Institute of Technology, United States)

09.40 am

Novel 2ΦMPL cooling circuit evaporator design for highly dissipative space electronic
Benjamin Lagier^{1,2}, Frédéric Boudesseul^{1,3}, Laure Baert^{1,4}
(¹IRT Saint-Exupéry ; ²Airbus Defense and Space ; ³THALES Alenia Space ; ⁴EPSILON, Toulouse, France)

10.05 am-10.30 am

Coffee Break / Table Top Exhibition

SESSION 1 (cont'd): ACTIVE & PASSIVE TWO-PHASE COOLING

Chairs: Jean-Pierre Fradin (ICAM Toulouse) / Alexandre Val (Valeo)

10.30 am

Study of instabilities in a two-phase Thermosyphon Loop for power converter cooling
Georgena Selva, Etienne Videcoq, Julien Caner, Adel Benselama, Manuel Girault
(Institut Pprime UPR CNRS 3346 - CNRS / ENSMA / Univ. Poitiers, France, France)

10.55 am

3D printed polymer-based two-phase cooling system for power electronic devices
Tony Gerges¹, Alexandre Marie², Thilini Wickramasinghe¹, Vincent Semet¹, Philippe Lombard¹, Stéphane Lips², Valérie Sartre², Bruno Allard¹, Michel Cabrera¹
(¹Univ Lyon, INSA Lyon, Université Claude Bernard Lyon 1, École Centrale de Lyon, CNRS, Ampère, UMR5505, 69621 ; ²Univ Lyon, INSA Lyon, CNRS, CETHIL UMR5008, F-69621, Villeurbanne, France)

11.20 am

New flat plate pulsating heat pipe for electric-car battery cooling
Thibault Van't Veer^{1,2}, Vincent Ayel², Mouad Diny¹, Yves Bertin², Etienne Videcoq²
(¹Stellantis – Carrières sous Poissy, France ; ²Institut PPRIME, ENSMA Poitiers France)

11.55 am – 01.30 pm

Lunch

SESSION 2: MODELLING AND SIMULATION

Chairs: Jean-Pierre Fradin (ICAM Toulouse) / Jean-Yves Soulier (Safran Data Systems)

01.30 pm

Modelling of the local electro-thermal behavior of discrete power diode using Verilog-A in a standard CAD environment
Achraf Kaïd¹, Fabrice Roqueta¹, Jean-Baptiste Kammerer², Luc Hébrard²
(¹STMicroelectronics, Tours, France ; ²ICube-CNRS, Strasbourg, France)

01.55 pm

Thermal Interface Material FEA characterization and selection for an EPS module package RBT robustness
Dandy N. Jaducana, Bernard Pepito Malolos, Leonel Soberano
(Integrated Micro-Electronics, Inc, Philippines)

02.20 am

Component location optimization on a PCB using machine learning
Philippe Soler (CAPGEMINI, France)

02.45 pm

Thermal model assessment of an industrial 0.15μm AlGaIn/GaN HEMT technology
Laurent Brunel¹, Christophe Chang¹, Dominique Carisetti²
(¹UMS, ²Thales R&T, France)

03.20 pm – 03.50 pm

Coffee Break / Table Top Exhibition

03.50 pm

Real-valued optimization of multi-node network for thermal modelling of electronic package using differential evolution algorithm
Eric Monier-Vinard, (ANSYS & Paris Nanterre university, France)

SESSION 3: LIQUID COOLING

Chairs: Bruno Levrier (BL Expertises) / Jean-Yves Soulier (Safran Data Systems)

04.15 pm

Self-adaptive structures acting as vortex generators for microelectronics liquid cooling
M. Vilarrubi^{1,3}, D. Regany¹, M. Ibáñez¹, J. Rosell¹, A. Amnache², É. Léveillé², L.-G. Fréchet^{2,3}, J. Barrau^{1,3}

¹Dynamic Systems Applied to Solar Energy Research Group, University of Lleida, 25001 Lleida, Spain

²Interdisciplinary Institute for Technological Innovation (3IT) and UMI-LN2, Université de Sherbrooke, 2500 Sherbrooke (Québec), Canada.

³ UniSCool - Universal Smart Cooling S.L., Lleida, Spain

04.40 pm

Thermal Interface Materials in Liquid Immersion for Power Electronics and Computing Systems

Dave Saums, (DS&A LLC - USA)

05.05 pm – 05:30 pm

End of 1st day Sessions / Table top Exhibition

05:50 pm – 10:00 pm

Social Event – Futuroscope Spectacle - Dinner

9th MARCH, 2023 (Thursday)



SESSION 4: CHARACTERIZATION AND TESTS, RELIABILITY

Chairs: Jean-Pierre Fradin (ICAM Toulouse) / Alexandre Val (Valeo)

09.00 am

Inline Failure Analysis of Sintered and Soldered Layers in Power Modules using Infrared Thermography

S. Panahandeh¹, D. May^{1,2}, C. Grosse-Kockert¹, M. Abo Ras¹

(¹Berliner Nanotest; ²TU Chemnitz, Germany)

09.30 am

Evolution of the thermal conductivity of sintered Ag paste as a function of the density and aging

Anas Sghuri, Yann Billaud, Loïc Signor, Didier Saury, Xavier Milhet

(Institut Pprime UPR CNRS 3346 - CNRS / ENSMA / Univ. Poitiers, France)

9:55 am - 10:25 am

Coffee Break/ Table top Exhibition

SESSION 4 (cont'd): CHARACTERIZATION & TESTS, RELIABILITY

Chairs: Jean-Pierre Fradin (ICAM Toulouse) / Jean-Yves Soulier (Safran Data Systems)

10.25 am

Assessment of embedded GaN HEMT junction temperature measurement accuracy

Alexandre Marie¹, Jean-Pierre Fradin¹, Laurence Allirand², Michel Aussel², Pierre-Yves Hamelin³

(¹ICAM Toulouse ; ²VITESCO Technologies ; ³ELVIA PCB -France)

10.50 am

Thermo-mechanical investigation of microelectronics on component and system level

M. Eichhorst¹ – L. Scheiter¹ – E.Noak^{1,2} – B.Seiler¹– S.Rzepka²

(¹Chemnitzer Werkstoffmechanik GmbH ;²Fraunhofer-Institut für Elektronische Nanosysteme ENAS, Germany)

11.15 pm

Use of thermal impedance analysis to determine physical defects of an innovative power module

Louis Alauzet¹, Jean-Pierre Fradin¹, Patrick Tounsi², Jacques Favre³

(¹Icam Toulouse, France ; ²CNRS, INSA, LAAS, Toulouse ; ³aPSI³D, Tarbes, France)

11.40 pm

Aging Investigations under Mechanical Stress on Thermal Interface Materials

Santiago Campos-Boettges, Antonio Harder and Mohamad Abo Ras

(Berliner Nanotest, Germany)

12.05 am – 1:35 pm

Lunch

SESSION 5: APPLICATIONS AND THERMAL ARCHITECTURE
Chairs: Bruno Levrier (BL Expertises) / Jean-Yves Soulier (Safran Data Systems)

- 01.35 pm** **Thermal Management at System Level for More Electrical Aircraft**
Laurent Lachassagne (Liebherr Aerospace, Toulouse, France)
- 02.00 pm** **How to Achieve a High Thermal Conductivity for Composite Packaging**
Muriel Sabah
(Safran Electronics and Defense, Massy, France)
- 02.25 pm** **Improvement of the thermal performance of printed circuit boards by embedding of graphite heat spreaders**
Ahmed Sabry Ahmed¹, Rémi Perrin¹, Cyril Buttay², Jacques Jay³
(¹Mitsubishi Electric R&D Centre Europe ; ²laboratoire Ampère, CNRS, ³CETHIL INSA de Lyon, France)
- 02.50 pm** **Direct Cooling of Power Modules by Two-Phase Systems**
Antoine Loerhmann¹, Vincent Ayel², Etienne Videcoq², Sébastien Dutour³, Benjamin Piaud⁴, Olivier Crépel¹
(¹Electrification Technologies - 1XRE, AIRBUS CTO / Central R&T, 31700 Toulouse, France ; ²Institut PPRIME, CNRS-ENSMA-Université de Poitiers, 86360 Futuroscope-Chasseneuil, France ; ³LAPLACE, UPS, INPT, CNRS, Université de Toulouse, 31555 Toulouse, France ; ⁴Méso-Star, 8 Rue des Pêchers, 31410 LONGAGES. France)
- End of Conferences/Closing address: J-Y Soulier, Conference Chairman**
- 3.15 pm – 03.30 pm** **Final coffee break and farewell**

3.30 pm – 05.00 pm **BONUS! Second ENSMA Thermal Lab Tour**



NEXT 2023 EVENT :

10th MiNaPAD
Micro/Nano-Electronics Packaging & Assembly, Design and Manufacturing Forum
June 7-8, 2023 – WTC Grenoble, France

REGISTRATION FORM ATW THERMAL MANAGEMENT

Final Registration ends on 6 March 2023

✚ RETURN REGISTRATION FORM ADDRESS:

IMAPS France - 17 rue de l'Amiral Hamelin 75016 Paris, France

E-mail: imaps.france@orange.fr Web site: www.imapsfrance.org

✚ WORKSHOP FEES INCLUDE: 2 nights Hotel, lunches and dinners from 7 March 8 pm to 9 March 4 pm.

☐ SPEAKERS	480 VAT excluded (576 €* VAT)
☐ CHAIRS/TECHNICAL COMMITTEE	480 VAT excluded (576 €* VAT)

✚ CONFERENCE ATTENDEES 2 DAYS

- | | | |
|--|----------------------------|---------------------------|
| ☐ IMAPS MEMBER (.....) | 600 € VAT* excluded | 720 €*VAT included |
| ☐ IMAPS NON MEMBER | 700 € VAT* excluded | 840 €*VAT included |
| ☐ Special Diet: ☐ Vegetarian ☐ Other _____ | | |

✚ CONFERENCE ATTENDEES 1 DAY

250 VAT €* excluded 300 €*VAT included (lunch is included, no hotel room)

Please confirm your attendance to the first day dinner to be held on 7 March by ticking the box ☐

Note: not ticking the box implies that you will not attend the dinner.

Reservations to the first day dinner must be submitted by 28 February, latest

✚ TOTAL FEES

VAT included : € *No refund in case of cancellation.

***For foreign companies, VAT will not be charged. VAT excluded€**

✚ **PAYMENT:** By bank transfer or by cheque to IMAPS or by credit card or even on line: <https://event.imapsfrance.org>

✚ IMAPS BANK REFERENCES

IBAN FR 49 3000 2089 4800 0007 9088 G25 BIC CRLYFRPP
LCL CREDIT LYONNAIS VERSAILLES ST LOUIS 16 RUE ROYALE 78000 VERSAILLES France

✚ ATTENDEE INFORMATION

NAME _____ FIRST NAME _____

COMPANY/ORGANIZATION _____

YOUR VAT NUMBER _____

FUNCTION _____

ADDRESS _____

Zip _____ City _____ Country _____

Phone _____ Email _____

HOW TO REACH DESTINATION OF CONFERENCE HOTEL



Hotel Mercure Futuroscope

Avenue Jean Monnet,
Teleport 3, BP 50190
86962 Chasseneuil Du Poitou
46°40'06.8"N 0°21'33.7"E

By Car:

- From Paris : A10 Highway estimated time 3h30
- From Bordeaux : A10 Highway ; estimated time 2h30

By Airplane:

- Airport Poitiers Biard : 15 minutes by taxi
- Air companies: Ryanair (London, Edinburg, Barcelone), Chailair aviation (Lyon)

By train:

Poitiers station : <https://www.sncf-connect.com/en-en/>

- 14 trains par day from Paris
 - 13h41-15h01 Poitiers n°7653 + 15h48-15h58 Futuroscope TER NA (suggestion)
- 9 Trains per day from Bordeaux
- Taxi or Bus Vitalis (Line 1) from Poitiers Train Station to Futuroscope Area

See for Bus Vitalis line 1 : <https://www.vitalis-poitiers.fr/>

Futuroscope station :

- From Paris to Futuroscope
 - 12h25-14h35 n°8333 TGV (suggestion)
- From Futuroscope to Paris
 - 19h33-21h20 n°8346 TGV (suggestion)