



THERMINIC 2025

((31st INTERNATIONAL WORKSHOP
Thermal Investigations of ICs and Systems))

31st INTERNATIONAL WORKSHOP

**THERMAL INVESTIGATIONS OF ICs AND
SYSTEMS**

24 – 26 SEPTEMBER 2025

CENTRO CONGRESSI FEDERICO II

NAPLES, ITALY

Wednesday, September 24, 2025

Registration

8:00 am - 8:50 am | Conference centre Hall

Welcome

8:50 am - 9:00 am | Aula Magna

Vincenzo d'Alessandro, University of Naples Federico II

1st Keynote

9:00 am - 9:40 am | Aula Magna

Chair: Vincenzo d'Alessandro, University of Naples Federico II

**Out-of-SOA Electrothermal Limitations of Power Semiconductor
Devices: Characterization and Modeling**

Andrea Irace, University of Naples Federico II

Vendors session

09:40 am - 10:00 am | Aula Magna

Coffee Break

10:00 am - 10:20 am | 1st Floor

Parallel Session 1

10:20 am - 11:20 am | Aula Magna & Aula A

Coffee Break

11:20 am - 11:40 am | 1st Floor

Parallel Session 2

11:40 am - 01:00 pm | Aula Magna & Aula A

Lunch

01:00 pm - 02:00 pm | 1st Floor

Poster Session A

02:00 pm - 03:00 pm | Aula Magna

Coffee Break & Poster Viewing

03:00 pm - 04:00 pm | 1st Floor

Parallel Session 3

04:00 pm - 05:40 pm | Aula Magna & Aula A

Welcome Cocktail

07:00 pm - 09:00 pm | Circolo Canottieri

1.A: Cooling Approaches for Devices, Packages, and Systems 1

10:20 am - 11:20 am | Aula Magna

Session Chair: Marta Rencz, Budapest University of Technology & Economics

Enhanced Heat Transfer and Flow Characteristics in a Liquid-cooled Microchannel with Adjacent Micro-Synthetic Jets: Influence of Reynolds Number and Stroke Length

Delara Soltani¹, Tim Persoons², Sajad Alimohammdi¹

1: Technological University Dublin, Ireland; 2: Trinity College Dublin, Ireland

Enhancing the Controllability of Forced Convection Liquid Cooling with Minichannel Heatsinks using Pulsating Flow of Variable Frequency

Galina Kennedy, Tim Persoons

Trinity College Dublin, Ireland

Heat Transfer Enhancement by Metamaterial Structures for Semiconductor Cooling

Md Lokman Hosain¹, Orlando Girlanda¹, Saeed Maleksaeedi²

1: Hitachi Energy Research, Sweden; 2: University of Waterloo, Canada

1.B: Thermal Management of Batteries 1

10:20 am - 11:20 am | Aula A

Session Chair: Marcello Iasiello, University of Naples Federico II

Air-Cooled Versus Liquid-Cooled Flat Pulsating Heat Pipes for Battery Thermal Management

Hazhir Fatahi, Arthur Labalte, Anil Kumar, Amrid Amnache, Luc G Fréchette
Université de Sherbrooke, QC, Canada

Fluid Dynamics in Immersion Battery Cooling: Linking Coolant Vortex Structures to Thermal Gradients and Lithium-ion Cell Performance and Longevity

Jibin Mathai Joy^{1,2,3}, Mattia Duranti², Edoardo Gino Macchi², Dibakar Rakshit^{1,3}

1: Department of Energy Science and Engineering, IIT Delhi, Hauz Khas, Delhi; 2: Sustainable Energy (SE) Fondazione Bruno Kessler, Trento, Italy; 3: Indian Institute of Technology Delhi (IITD)-Abu Dhabi, United Arab Emirates

Numerical and Experimental Investigation of Liquid Tab Cooling of a Prismatic Battery

David W. Salter, Aidan Mullaney, Kantharuphan Annathurai, Rajesh Nimmagadda, Daniel Trimble, Seamus O'Shaughnessy
Trinity College Dublin, Ireland

2.A: Cooling Approaches for Devices, Packages, and Systems 2

11:40 am - 01:00 pm | Aula Magna

Session Chair: Lorenzo Codecasa, Polimi

Impact of Adiabatic and Condenser Lengths on the Thermal Performance of Flat Pulsating Heat Pipes

Anil Kumar, Arthur Labalte, Hazhir Fatahi, Amrid Amnache, Luc G. Frechette
University of Sherbrooke, Canada

Efficient Chip-integrated Microfluidic Cooling Through Jet-enhanced Manifold Microchannels

Weiyu Tang, Hongkeng Zhu, Ibrahim Osama Elhagali, Elison Mاتيoli
Power and Wide-Band-Gap Electronics Research Laboratory (POWERlab), École Polytechnique Fédérale de Lausanne (EPFL), Lausanne, Switzerland

An Experimental Investigation of Guided Flow Liquid Cooling Methods on a Four Cell Prismatic Module

David W. Salter, Ciaran Huckfeldt, Kantharuphan Annathurai, Rajesh Nimmagadda, Daniel Trimble, Seamus O'Shaughnessy
Trinity College Dublin, Ireland

Manufacturing and Design Optimisation of an Air Amplifier for Data Centre Server Cooling Applications

David W. Salter^{1,2}, Eoin H. Oude Essink¹, Gordon O'Brien², Tim Persoons², Sajad Alimohammadi¹

1: Technological University Dublin, Ireland; 2: Trinity College Dublin, Ireland

2.B: Thermal Management of Batteries 2

11:40 am - 01:00 pm | Aula A

Session Chair: Antonio Pio Catalano, University of Naples Federico II

A Numerical and Experimental Comparative Study on Cold Plate Cooling of a 5.6kW Tesla Battery Module

Kantharuphan Annathurai, David Salter, Rajesh Nimmagadda, Daniel Trimble, Seamus O'Shaughnessy
Trinity College Dublin, Ireland

Thermal Performance of a Heat Pipe with Triangular Grooves for Battery Cooling Applications in Electric Vehicles

Sabrina Costa Chichinelli, Larissa Krambeck, Kelvin Guessi Domiciano, Ricardo Brandalise Botelho, Marcia Barbosa Henriques Mantelli
Federal University of Santa Catarina, Brazil

Temperature Estimation and Thermal Runaway Detection in a Novel Battery Module Arrangement Incorporating a Reduced Number of Sensors

Ane Sainz De La Maza Escobal^{1,2}, Filippo Gerbino³, Davide Spaggiari³, Danilo Santoro³, Edorta Ibarra², David Ansean⁴, Elena Trancho¹, Nicola Delmonte³

¹Tecnalia, Basque Research and Technology Alliance (BRTA), Derio, Spain; ²University of the Basque Country (UPV/EHU), Bilbao, Spain; ³University of Parma, Parma, Italy; ⁴Department of Electrical Engineering, University of Oviedo, Gijón, Spain

Thermal Management of Battery Cells in Electric Vehicles: Design and Analysis Under Various C-Rates and Environmental Conditions

Ali Eray Torun, Ahmet Çömez, Caner Demir, Hakan Uysal
ASELSAN, Türkiye

Critical Analysis of Intersection-point-based Techniques for the Experimental Indirect Determination of Thermal Resistance in Bipolar Transistors

Vincenzo d'Alessandro¹, Ciro Scognamillo¹, Antonio Pio Catalano¹, Lorenzo Codecasa²

¹Department of Electrical Engineering and Information Technology, University Federico II, Naples, Italy; ²Department of Electronics, Information, and Bioengineering, Polytechnic of Milan, Milan, Italy

HTRB-Based Assessment of Epoxy Mold Compounds Using a Multi-DUT Monitoring Platform

Alessandro Borghese, Guglielmo Marignetti, Giuseppe Capasso, Giovanni Breglio, Luca Maresca, Michele Riccio, Andrea Irace
University of Naples Federico II, Italy

Temperature-dependent Equivalent Circuit Modeling of PiN Diodes for Accurate Electromagnetic Simulations of Reconfigurable Intelligent Surfaces

Ilaria Matakana, Vincenzo d'Alessandro
University of Naples Federico II, Italy

Aging Effect on Temperature Behaviour in Li-ion Battery Cell: A Case of Study

Adolfo Dannier, Marino Coppola, Mattia Ribera, Diego Iannuzzi
University of Napoli Federico II, Italy

Improving Photovoltaic Reliability with Temperature-aware Hot-spot Mitigation

Gerardo Saggese, Monica De Riso, Pierluigi Guerriero, Santolo Daliento
University of Napoli Federico II, Italy

Experimental Evaluation of a Passive Dual Two-Phase Cooling System for EV Batteries Using a Dielectric Fluid and a Pulsating Heat Pipe

Luca Cattani¹, Federico Sacchelli¹, Fabio Bozzoli¹, Alessandro Soldati², Alex Musetti²

¹Department of Engineering for Industrial Systems and Technologies, University of Parma, Italy; ²Department of Engineering and Architecture, University of Parma, Italy

Hysteresis Phenomenon in the Electric Parameters of Lithium-ion Batteries Under Temperature Effects

Simone Barcellona¹, Lorenzo Codecasa¹, Silvia Colnago², Dario D'Amore¹

¹Politecnico di Milano, DEIB, Italy; ²Ricerca sul Sistema Energetico, TGM, S.p.A.

Development of Automated 1D Simulation Methodology for Predicting the Cooling Performance of Electric Vehicle Battery Systems

Samuel Yu, Jinwon Seo, Bongkeun Choi

Hyundai Mobis, Korea, Republic of (South Korea)

Thermal Analysis of a 5G Telecom Demonstrator in FO-WLP SiP with Integrated GaN Power Amplifier and GaAs Low Noise Amplifier

Anass Jakani¹, Jean-Claude Jacquet¹, N'Doua Luc Arnaud Kakou², Mohamed Bouslama¹, Vincent Bortolussi³, Nicolas Sarazin⁴, Benoit Lambert³, Raphael Sommet², Stephane Piotrowicz¹, Gildas Gauthier¹

¹III-V Lab, France; ²XLIM, France; ³UMS (United Monolithic Semiconductors), France; ⁴TRT (Thales Research & Technology)

Characterisation of Thermal Interface Materials Under Sustained Cyclic Thermo-Mechanical Loading

Philip Matzick, Matteo Beligoi, Stefan Mollov, Christian Mentin

Silicon Austria Labs, Austria

Multi-scale and Multi-physics Analysis of a GaN System in Package Using Fan Out Wafer Level Packaging (FO-WLP) Technology

N'Doua Luc Arnaud Kakou¹, José Anderson Silva dos Santos¹, Raphael Sommet¹, Vincent Bortolussi², Anass Jakani³, Jean-Christophe Nallatamby¹

¹XLIM, UMR7252, Université de Limoges, France; ²United Monolithic Semiconductor, Villebon sur Yvette, France; ³3 - 5 Lab, Palaiseau, France

Integration of Jet Impingement with Enhanced Pin Fin Structures for In-Chip Cooling of Power Electronics

Ibrahim Osama Elhagali, Hongkeng Zhu, Weiyu Tang, Elison Matioli
EPFL, Switzerland

Improved Thermal Transient Testing of GaN Devices Manufactured with Various Construction Principles

Sandor Ress^{1,2}, Gabor Farkas¹, Mahmoud Darwish¹, Marta Rencz², Zoltan Sarkany¹
¹SIEMENS DISW, Hungary; ²Budapest University of Technology and Economics, Hungary

Thermal Characterization of a Novel Direct Cooler Design for Modular Power Devices

Filippo Gerbino, Luca Cattani, Fabio Bozzoli, Davide Spaggiari, Paolo Cova, Roberto Menozzi
University of Parma, Italy

4H-SiC Power MOSFET Body Diode as a Highly-linear Temperature Sensor for T_j Monitoring

Francesco G. Della Corte¹, Riccardo Carotenuto², Demetrio Iero², Massimo Merenda², Giovanni Pangallo²
University of Napoli Federico II, Italy; ²Mediterranea University of Reggio Calabria, Italy

Thermal Analysis of Fast-Charger Contactless Power Transfer for Electric Buses

Luigi Pio Di Noia, Renato Rizzo
University of Napoli Federico II, Italy

Prediction of Dynamic Thermal Behavior of Novel Ceramics for Power Devices Using Numerical Simulations

Peter Gabor Szabo, Gyorgy Bogнар, Laszlo Pohl
Budapest University of Technology and Economics, Hungary

Numerical Investigation on Thermal Behaviour of Horizontal Plate Heat Sink with Metal Foam Partially Embedded in PCM for Passive Cooling System

Aanandsundar Arumugam, Bernardo Buonomo, Furio Cascetta, Oronzio Manca, Sergio Nardini
Universita' degli Studi della Campania "Luigi Vanvitelli", Italy

3.A: Cooling Approaches for Devices, Packages, and Systems 3

04:00 pm - 05:40 pm | Aula Magna

Session Chair: John Parry, Siemens//Mentor Graphics

Heat Transfer Augmentation in Fin Channels using Self-Oscillating Reeds

Sourabh Kumar Jha, Ari Glezer

Georgia Institute of Technology, United States of America

Numerical Simulations of Heat Transfer in Moderately High Swirling Pipe Flows

Lorenzo Testa, Tim Persoons

Trinity College Dublin, Ireland

Design and analysis of biomimicry-based Gradient microchannel heat sinks to effectively dissipate hotspots by mitigating flow maldistribution

Mahalingam Periasamy, Ganesan Narendran

IIITDM Kancheepuram, India

A Deep Dive into an Air Cooled Data Centre's Mechanical Cooling System Energy Consumption

Younis Osama Abdelsalam¹, Tim Persoons², Sajad Alimohammadi¹

¹School of Mechanical & Design Engineering, College of Engineering & Built Environment, Technological University Dublin, City Campus, Dublin D01 K822, Ireland; ²Department of Mechanical, Manufacturing & Biomedical Engineering, University of Dublin, Trinity College, Dublin D02 PN40, Ireland

Testing of Two-Phase Cooling of Bipolar Plates for Fuel Cells

Henk Jan van Gerner¹, Georg Mühlthaler², Marcus-Benedict Buntz³

¹NLR - Royal Netherlands Aerospace Centre, 1059 CM Amsterdam, The Netherlands;

²Airbus Commercial Aircraft, 22335 Hamburg, Germany; ³Aerostack GmbH, 72581 Dettingen, Germany

3.B: Advanced Packaging Solutions

04:00 pm - 05:40 pm | Aula A

Session Chair: Bernhard Wunderle, TU Chemnitz

Thermal Management Investigation of a V-band GaN Amplifier Embedded into an Advanced Package

Mohamed Bouslama¹, Anass Jakani¹, Jean-Claude Jacquet¹, Stéphane Piotrowicz¹, Louiza Hamidouche¹, Quentin Levesque¹, Benoit Lambert², Gildas Gauthier¹

¹III-V Lab, France; ²UMS S.A.S, France

Thermal Contact Resistance Improvement Between Clip Attached TO-247 Package and Heat Sink with Insertion of an Ultra-Thin Interlayer Silver Film

Zsolt Toth-Pal, Hans-Peter Nee

KTH Royal Institute of Technology, Sweden

Laser Powder Bed Fusion of Multi-Material Heat Sink on Silicon Substrate: A Sn-Al Solution for High-power Electronic Heat Dissipation

Andrea Mistrini¹, Amin Hodaei², Martina Meisnar³, Davoud Jafari², Riccardo Casati¹

¹Politecnico di Milano; ²University of Twente; ³European Space Agency

Pool Boiling Heat Transfer on Directly 3D-printed Metallic Micropillars on Silicon Chips

Andrea Mistrini¹, Irene Marchi², Amin Hodaei³, Shirin Dehgahi³, Alekos Ioannis Garivalis², Paolo Di Marco², Riccardo Casati¹, Davoud Jafari³

¹Politecnico di Milano, Italy; ²University of Pisa, Italy; ³University of Twente, The Netherlands

Graphene Aerogel Enhancement for Next-Generation Ultralight Thermal Management Applications

Jiho Kang¹, Viet Phuong Nguyen^{2,3}, Seung-Mo Lee^{2,3}, Duckjong Kim¹

¹Gyeongsang National University, Korea, Republic of (South Korea); ²Nanomechatronics, University of Science and Technology (UST); ³Department of Nanomechanics, Korea Institute of Machinery & Materials (KIMM)

Thursday, September 25, 2025

2nd Keynote

9:00 am - 9:40 am | Aula Magna

Chair: Lorenzo Codecasa, Politecnico di Milano

From Thermal Resistance to Power Efficient Thermal Design: Is Thermal still the Cinderella of Semiconductor Industry?

Claudio Maria Villa, STMicroelectronics

Coffee Break

09:40 am - 10:00 am | 1st Floor

Parallel Session 4

10:00 am - 11:20 am | Aula Magna & Aula A

Coffee Break

11:20 am - 11:40 am | 1st Floor

Parallel Session 5

11:40 am - 01:00 pm | Aula Magna & Aula A

Lunch

01:00 pm - 02:00 pm | 1st Floor

Poster Session B

02:00 pm - 03:00 pm | Aula Magna

Coffee Break & Poster Viewing

03:00 pm - 04:00 pm | 1st Floor

Parallel Session 6

04:00 pm - 05:00 pm | Aula Magna & Aula A

Steering Committee Meeting

05:00 pm - 06:00 pm | Aula B

Appointment to get the BUS

07:20 pm - 07:30 pm | Outside the conference centre

Gala Dinner

08:00 pm - 11:00 pm | Villa Doria d'Angri

4.A: Advanced Thermal Measurement Techniques 1

10:00 am - 11:20 am | Aula Magna

Session Chair: Tim Persoons, Trinity College Dublin

Monitoring Electrothermal-Induced Package Strain During HTRB Using Fiber Optic Sensors

Alessandro Borghese, Vincenzo Romano Marrazzo, Francesco Fienga, Michele Riccio, Luca Maresca, Giovanni Breglio, Andrea Irace
University of Naples Federico II, Italy

Thermal-Resistance-Based Reliability of TIM1 Materials in a Lidded Thermal Test Vehicle Under Active Thermal Load-Cycling

Maik Sternberg¹, Daniel May², Dan R. Wargulski¹, Kaushal Arun Pareek¹, Bernhard Wunderle^{2,3}, Mohamad Abo Ras¹

¹Berliner Nanotest und Design GmbH, Germany; ²Chemnitz University of Technology, Germany; ³Fraunhofer ENAS, Germany

Optimal Sensor Placement for Thermal Virtual Sensing in Electronic Systems Using Augmented Kalman Filtering

Matteo Depaola^{1,2,3}, Daniel De Gregoriis², Robin Bornoff⁴, Bart Vandeveldel¹, David Moens^{3,5}

¹Imec; ²Siemens Industry Software NV; ³KU Leuven; ⁴Siemens Industry Software; ⁵Flanders Make

Experimental Comparison of Variable Density Heatsinks Under Flow Boiling Conditions

Jaume Camarasa, Montse Vilarrubí, Desideri Regany, David Beberide, Pol Rosell, Joan Ignasi Rosell, Manel Ibáñez, Jérôme Barrau
Universitat de Lleida, Spain

4.B: Advances in Thermal Modeling and Simulation 1

10:00 am - 11:20 am | Aula A

Session Chair: Lorenzo Codecasa, Politecnico di Milano

Circuit-based Thermal Modeling of Phase Change Materials for Fast Dynamic Simulations

Francesco Piccirillo¹, Antonio Pio Catalano², Ciro Scognamillo², Marcello Iasiello¹, Nicola Bianco¹, Vincenzo d'Alessandro²

¹Department of Industrial Engineering, University of Naples Federico II, Italy; ²Department of Electrical Engineering and Information Technology, University of Naples Federico II, Italy

Heat Transfer Performance Modelling for Liquid Cooling of High-Power Electronics

Wendy Luiten

WLC, The Netherlands

VOLTERRA: An Innovative Approach for Accurate Nonlinear Thermal Modeling of Electronic Components

Giorgio Eliseo¹, Ciro Scognamillo¹, Antonio Pio Catalano¹, Vincenzo d'Alessandro¹, Lorenzo Codecasa²

¹Department of Electrical Engineering and Information Technology, University of Naples Federico II, Italy;

²Department of Electronics, Information and Bioengineering, Politecnico di Milano, Milan, Italy

Bayesian Parameter Estimation and Uncertainty Quantification for 1D Low-element Thermal Networks

Christian Findenig¹, Lisa Mitterhuber¹, Julien Magnien¹, Robert Peharz², Manfred Mücke¹

¹Materials Center Leoben Forschung GmbH, Austria; ²Graz University of Technology, Austria

5.A: Advanced Thermal Measurement Techniques 2

11:40 am - 01:00 pm | Aula Magna

Session Chair: Claudio Maria Villa, ST Microelectronics

Experimental Evaluation of Different Cold Plates Configurations for Direct-to-chip Liquid Cooling

David Beberide^{1,2}, Montse Vilarrubi^{1,2}, Jaume Camarasa², David Sancho¹, Desideri Regany², Jérôme Barrau^{1,2}

¹Universal Smart Cooling SL, Spain; ²Universitat de Lleida, Spain

Experimental Comparative Analysis of PCB Cooling Technologies Including Nonlinear Thermal Effects

Denis Musella², Elena Mengotti¹, Enea Bianda¹, Hemant Bishnoi¹, Ciro Scognamillo², Vincenzo d'Alessandro², Antonio Pio Catalano²

¹ABB Corporate Research Center, Switzerland; ²Department of Electrical Engineering and Information Technology, University of Naples Federico II, Italy

High-Resolution Thermal Analysis of Interface and Microstructure Formation in SAC-Cu Solder Joints

Lisa Mitterhuber, Verena Leitgeb, Elke Kraker, Julien Magnien
Materials Center Leoben Forschung GmbH, Austria

Stainless-steel Flat Plate Pulsating Heat Pipe: An Alternative for Electronic Cooling

Larissa Krambeck¹, Kelvin G. Domiciano¹, Maria E. Beé¹, Marco Marengo², Marcia B. H. Mantelli¹

¹Heat Pipe Laboratory, Federal University of Santa Catarina, Florianopolis/SC, Brazil;

²Department of Civil Engineering and Architecture, University of Pavia, Pavia, Italy

5.B: Advances in Thermal Modeling and Simulation 2

11:40 am - 1:00 pm | Aula A

Session Chair: Marcin Janicki, Lodz University of Technology

Thermohydraulic Lumped Parameter Models for Direct Battery Cooling

Lander Cnudde^{1,2}, Jana Rogiers^{1,2}, Jasper Nonneman^{1,2}, Michel De Paepe^{1,2,3}

¹Ghent University, Ghent, Belgium; ²FlandersMake@UGent - Core lab MIRO, Leuven, Belgium; ³University of Cape Town, Cape Town, South Africa

Electro-thermal Analysis of p-GaN Gate e-mode HEMTs with Ohmic and Schottky Gates

Minji Kim, Jiun Oh, Joon Seop Kwak

Korea Institute of Energy Technology, Korea, Republic of (South Korea)

Numerical Study of Transient Heat Transport in 4H-SiC Triggered by UV Laser Pulses

Janusz Wozny, Andrzej Kubiak, Alessandro Verdolotti, Ewa Raj

Lodz University of Technology, Poland

SPICE Modeling of GaN HEMTs in the Wide Temperature Range (−269°C...+500°C)

Konstantin O. Petrosyants, Mamed R. Ismail-zade, Lev M. Sambursky

National Research University Higher School of Economics (Moscow Institute of Electronics and Mathematics), Russian Federation

Numerical Investigation of the Thermal Behavior of 3-D GaN LEDs for Thermal-Aware Design

Ciro Scognamillo¹, Antonio Pio Catalano¹, Janusz Wozny², Ewa Raj², Vincenzo d'Alessandro¹

¹Department of Electrical Engineering and Information Technology, University of Naples Federico II, Italy; ²Department of Semiconductor and Optoelectronics Devices, Lodz University of Technology, Politechniki 10, 93-590 Lodz, Poland

Failure Analysis for Electronic Packaging Materials: A Comparative Study of Pulsed and Lock-In Thermography

Yanan Wu^{1,2}, Kaushal Arun Pareek¹, Daniel May², Marek Zajackowski¹, Corinna Grosse-Kockert¹, Mohamad Abo Ras¹, Ralph Schacht³, Bernhard Wunderle^{2,4}

¹Berliner Nanotest und Design GmbH, Germany; ²Technische Universität Chemnitz, Germany; ³Brandenburg University of Technology Cottbus-Senftenberg, Germany; ⁴Fraunhofer ENAS, Germany

SPICE-based Switching Energies Estimation of SiC Power Transistors

Paweł Górecki, Krzysztof Górecki
Gdynia Maritime University, Poland

Investigation of the Compact Thermal Modeling of SiC-based Power MOSFETs

Antonio Pio Catalano¹, Gianpaolo Romano², Michele Riccio¹, Andrea Irace¹, Lorenzo Codecasa³, Vincenzo d'Alessandro¹

¹Department of Electrical Engineering and Information Technology, University of Naples Federico II, Italy; ²StarPower Europe AG, Baden, Switzerland; ³Department of Electronics, Information and Bioengineering, Politecnico di Milano, Milan, Italy

3D Modelling of Mass and Heat Transport in Multi-Phase Microfluidic Systems

Zsombor Szomor¹, Tamás Pardy², Péter Fürjes¹

¹Centre for Energy Research, Hungary; ²Tallinn University of Technology

A Time-Efficient Approach to Thermal-electrical Analysis of Six-pack IGBT-based Power Module

Debora Crimi, Edoardo Marchica, Emanuela Privitera, Radha Russo
Nexperia B.V.

Reduced BJT Power Dissipation via Saturated Operation in Full Wave Rectifiers

Riccardo Carotenuto¹, Demetrio Iero¹, Massimo Merenda¹, Francesco G. Della Corte²
¹Mediterranea University of Reggio Calabria; ²University of Napoli Federico II, Italy

Peltier Cooling for Thermal Management and Efficiency Enhancement in Perovskite Solar Cells

Hichem Bencherif¹, Ziyad Younsi¹, Francesco G. Della Corte²
¹Higher National School of Renewable Energies, Environment and Sustainable Development, Campus Fesdis, Batna Algeria; ²Department of Electrical Engineering and Information Technology, University Federico II, Italy

Thermal Performance of Server Voltage Regulator Modules in Liquid and Air-cooling System

Donata Gualandris, Andrea Garuffo
STMicroelectronics, Italy

Thermal Characterization of Heat Pipe Embedded Heat Spreaders for High Performance Computer Cooling in Automotives

Baris Erol¹, Daniel May¹, Bernhard Wunderle^{1,2}
¹Chemnitz University of Technology, Germany; ²Fraunhofer ENAS

Three-Omega Method for Characterization of Thermal Conductivity of Samples at Cryogenic Temperatures

Carlos Rincon-Ruiz¹, Nathanael Jöhrmann¹, Uwe Zschenderlein¹, Corinna Grosse-Kockert⁵, Bernhard Wunderle^{1,2,3,4}
¹Technische Universität Chemnitz, Germany; ²Fraunhofer ENAS, Chemnitz, Germany; ³Center for Micro- and Nanotechnologies (ZfM), Chemnitz, Germany; ⁴Center for Materials, Architectures and Integration of Nanomembranes (MAIN), Chemnitz, Germany; ⁵Nanotest Berlin, Germany

Fast Extraction of Thermal System Model for a Silicon Carbide Power Module Based on a 1D and 3D Hybrid Simulation Framework

Zhaozan Feng, Jianfeng Li, Jinzhou Cao, Guomeng Song, Yangju Zou, Yu Qi
Zhuzhou CRRC Times Electric UK Innovation Center, United Kingdom

Effect of the Condenser on the Thermal Performance of a Mini Loop Heat Pipe

Kelvin Guessi Domiciano, Larissa Krambeck, Maria Eduarda Beé, Marcia Barbosa
Henriques Mantelli
Federal University of Santa Catarina, Brazil

An Advanced High Temperature Device Heating Methodology for Automotive Grade Zero Conditions

Heinrich Helldorff¹, Michael Glavanovics¹, Bernd Deutschmann², Alexander Ulbing¹,
Gerhard Glatte¹
¹KAI Kompetenzzentrum Automobil- und Industrieelektronik GmbH, Austria; ²Graz
University of Technology

Optimizing Boosting for Faster Calorimetric Measurement of High-Efficiency Electric Machines

Jasper Nonneman^{1,2}, Ilya T'Jollyn³, Jeroen De Kooning^{1,2}, Michel De Paepe^{1,2,4}
¹Ghent University, Ghent, Belgium; ²FlandersMake@UGent - Core lab MIRO, Leuven,
Belgium; ³University of Antwerp, Antwerp, Belgium; ⁴University of Cape Town, Cape
Town, Sout Africa

Verification of Thermal Transient Measurement Methods for Cascode Type SiC JFETs

Wasanthamala Badalawa, Yoshitaka Aoki, Tomoaki Hara
SIEMENS, Japan

Numerical Thermal Analysis of Liquid-Cooled Electric Motors for High-Performance Applications

Ozan Atalay, Ahmet Comez, Ali Eray Torun, Caner Demir
ASELSAN, Turkiye

Fast Approach with Analytical Models for Heat Sink Modelling and Optimization

Dinuka Herath^{1,2}, Ibrahim Harbi², Aleksei Maksimov², Thiwanka Wijekoon²
¹Technical University Munich; ²Huawei Technologies Duesseldorf GmbH

Cooling Strategies for PCB-Mounted MOSFETs: Comparative Analysis and Numerical Simulations

Monzer Rayya, Cagri Balikci
CARIAD SE, Germany

6.A: Advanced Thermal Measurement Techniques 3

04:00 pm - 05:00 pm | Aula Magna

Session Chair: Pavel Makhnatch, Huawei Technologies Sweden AB

Experimental Investigation of Flow Boiling Heat Transfer in Different Flow Regimes

Jana Rogiers¹, Jasper Nonnemann^{1,2}, Hendrik Vansompel^{1,2}, Michel De Paepe^{1,2,3}

¹Ghent University, Ghent, Belgium; ²FlandersMake@UGent – Core lab MIRO, Leuven, Belgium; ³University of Cape Town, Cape Town, South Africa

Development and Integration of Phase Change Materials to Limit Operating Temperatures

Mathias Nowottnick, Andrej Novikov, Leander Lorenz

University of Rostock, Germany

An Approach to Thermoelectric Module Selection: Analytical Simulation and Experimental Test

Fabio Capolupo^{1,2}, Pesapane Mara¹, Marilena Musto^{1,2}, Russo Roberto²

¹Industrial Engineering Department, University of Napoli Federico II, Italy; ²Institute of Applied Sciences and Intelligent Systems, National Research Council of Italy

6.B: Advances in Thermal Modeling and Simulation 3

04:00 pm - 05:00 pm | Aula A

Session Chair: Wendy Luiten, WLC

Electrochemical-Thermal Modelling of Forced Convection Immersion Cooling of an 8-Cell Lithium-Ion Prismatic Battery Module

Rajesh Nimmagadda, David W. Salter, Kantharuphan Annathurai, Daniel Trimble, Seamus M. O'Shaughnessy
Department of Mechanical, Manufacturing & Biomedical Engineering, Trinity College Dublin, Ireland

FEM-Assisted Design and Characterization of a New Lithium Battery Pack-Heatsink Assembly

Nicola Delmonte¹, Danilo Santoro¹, Davide Spaggiari¹, Filippo Gerbino¹, Paolo Cova¹, Ane Sainz De La Maza^{2,3}, Edorta Ibarra², Elena Trancho³, Roberto Menozzi¹

¹University of Parma, Department of Engineering and Architecture, Italy; ²University of the Basque Country, Department of Electronic Technology, Spain; ³Tecnalia, Basque Research and Technology Alliance (BRTA), Spain

Investigation and Compact Modeling of Self-heating in Buried Gate Carbon Nanotube Field-effect Transistors

Deepak Kumar, Michael Schröter
Technische Universität Dresden, Germany

Friday, September 26, 2025

3rd Keynote

9:00 am - 9:40 am | Aula Magna

Chair: Marcello Iasiello, University of Naples Federico II

**Data center direct-to-chip cooling with two-phase heat exchangers:
Challenges and possible solutions**

Filippo Cataldo, Wieland Thermal Solutions

Coffee Break

09:40 am - 10:00 am | 1st Floor

Parallel Session 7

10:00 am - 11:20 am | Aula Magna & Aula A

Coffee Break

11:20 am - 11:40 am | 1st Floor

Session 8

11:40 am - 01:00 pm | Aula Magna

Lunch

01:00 pm - 02:00 pm | 1st Floor

Session 9

02:00 pm - 03:20 pm | Aula Magna

Coffee Break

03:20 pm - 03:40 pm | 1st Floor

Awards & Closing Remarks

03:40 pm - 04:20 pm | Aula Magna

7.A: Thermal Management in Power Electronics 1

10:00 am - 11:20 am | Aula Magna

Session Chair: Patrick Tounsi, LAAS - CNRS

Electrothermal Performance Enhancement of Silicon Carbide Gate-All-Around MOSFETs Using a Ferroelectric Gate Stack

Vincenzo Terracciano¹, Alessandro Borghese¹, Marco Boccarossa¹, Andrea Irace¹, Giovanni Salvatore², Luca Maresca¹

¹University of Naples Federico II, Italy; ²Ca' Foscari University of Venice, Italy

Dielectric Liquid Cooling of 2.0 kV SiC MOSFET Power Module Using Jet Impingement and Pumped Immersion Flow

Till Huesgen, Johann Renner, Balasubramanian Vaidyanathan, Vladimir Polezhaev
Hochschule Kempten - University of Applied Sciences, Germany

A Comparative Analysis of the Thermal Performance of DBC and Novel IMS Substrates of IGBT Devices

János Hegedüs¹, Gusztáv Hantos¹, Gyula Lipák¹, Andrea Reolon², András Poppe¹, Ferenc Ender¹

¹Budapest University of Technology and Economics, Hungary; ²Serigroup, Italy

Multiphysics Simulations for IGBT Power Semiconductor Module Cooling

Péter Pálovics¹, Eeli Kerttula², Atte Hoffrén², Joonas Leppänen², Ferenc Ender¹

¹Budapest University of Technology and Economics, Budapest, Hungary; ²ABB Oy, Motion, Technology Collaboration Office, Helsinki, Finland

7.B: Advances in Thermal Modeling and Simulation 4

10:00 am - 11:20 am | Aula A

Session Chair: [Ciro Scognamillo](#), University of Naples Federico II

Integrated Modelling Framework for 3D IC Package Thermal Design

Sudarshan Deo¹, Andras Vass-Varnai¹, [Peter Gabor Szabo](#)²

¹Siemens EDA, United States of America; ²Budapest University of Technology and Economics

Simplified Thermal Transient Testing: Unlocking Affordable, Open-source Solutions

[Nils Jonas Ziegeler](#)^{1,2}, Stefan Schweizer^{1,3}

¹South Westphalia University of Applied Science; ²Forvia SE; ³Fraunhofer Application Center for Inorganic Phosphors

Comparative Analysis of TPMS Structures for Optimized CPU/GPU Thermal Management Using Generative Design

Ine Vandebeek, Ramadan Krasniqi, Luis Cusicanqui, [Lieven Vervecken](#)

Diabatix, Belgium

Influence of Heat Source Dimensions and Heat Transfer Coefficient Value on Temperature of Electronic Circuits Cooled by Free Convection

[Marcin Janicki](#)

Lodz University of Technology, Poland

8: Thermal Management in Power Electronics 2

11:40 am - 01:00 pm | Aula Magna

Session Chair: András Poppe, Budapest University of Technology and Economics

Study of Breakdown Mechanisms in GaN/AlGaN HEMTs Under Various Short Circuit Tests Using p-GaN Schottky Gate Current as Thermal Sensitive Parameter

Christale Crouard^{1,2}, Mickael Rouch¹, Jonathan Godillon¹, Julio Brandelero¹, Patrick Tounsi²

¹STMicroelectronics, France; ²LAAS-CNRS, France

Toward Real-Time Junction Temperature Estimation with a Physics-Informed Attention LSTM

Alessandro Varaldi¹, Maurizio Tranchero², Lorenzo Giraudi², Claudio Genta², Marco Vacca¹

¹Politecnico di Torino, Italy; ²Ideas & Motion

K-factor Calibration Issues of IGBTs

Gusztáv Hantos, János Hegedüs, Gyula Lipák, András Poppe, Ferenc Ender
Budapest University of Technology and Economics, Hungary

Development of a Surrogate Model for a Phase Change Material Heat Sink for Thermal Buffering of Power Electronics

Maité Goderis^{1,2}, Jana Rogiers^{1,2}, Michiel De Paepe¹, Wito Plas^{1,2}, Hendrik Vansompel^{1,2}, Michel De Paepe^{1,2,3}

¹Ghent University, Department of Electromechanical, Systems and Metal Engineering, Sint-Pietersnieuwstraat 41, Ghent, 9000, Belgium; ²FlandersMake@UGent – Core lab MIRO, Ghent, 9000, Belgium; ³University of Cape Town, Department of Mechanical Engineering, Private Bag X3, Rondebosch 7701, South Africa

9: Thermal Investigation of LEDs and Solar Cells

02:00 pm - 03:20 pm | Aula Magna

Session Chair: Pierluigi Guerriero, University of Naples Federico II

Reliability of High-Power LEDs Under Varying Thermal Aging Conditions

Andreas Zippelius, Elias Hufnagel, Jainam Shah, Maximilian Schmid, Gordon Elger
Technische Hochschule Ingolstadt, Germany

Extrinsic Failure of High-power Blue LEDs for Horticulture Applications Stressed in Hot Environments

Alessandro Caria, Riccardo Fraccaroli, Giulia Pierobon, Thomas Castellaro, Ambrogio Huang, Carlo De Santi, Matteo Buffolo, Nicola Trivellin, Enrico Zanoni, Gaudenzio Meneghesso, Matteo Meneghini
University of Padova, Italy

Thermal Aspects of Infrared LED Sources Interfering with Military Night Vision Systems

János Hegedűs, Gusztáv Hantos, András Poppe
Budapest University of Technology and Economics, Hungary

Electro-thermal Circuit Models of PhotoVoltaic Cells Subjected to Optical Degradation Phenomena

Marco Balato¹, Martina Botti^{2,3}, Antonio Pio Catalano¹, Luigi Costanzo², Vincenzo d'Alessandro¹, Athanasios G. Papathanasiou⁴, Carlo Petrarca¹, Ciro Scognamillo¹, Luigi Verolino¹, Massimo Vitelli²

¹University of Naples Federico II, Italy; ²University of Campania "Luigi Vanvitelli"; ³University of Salerno; ⁴National Technical University of Athens

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Thank you for attending



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