



Thermal investigations of ICs and Systems

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Call for Papers

THERMINIC Workshops are a series of events to discuss the essential thermal questions of microelectronic microstructures and electronic parts in general. These questions are becoming more and more crucial with the increasing element density of circuits packaged together and with the move to nanotechnology. These trends are calling for thermal simulation, monitoring and cooling. Thermal management is expected to become an increasingly dominating factor of a system's cost. The growing power dissipated in a package, the mobile parts of microsystems raise new thermal problems to be solved in the near future necessitating the regular discussion of the experts in these fields. Finally, there is an increasing need for accurate assessment of the boundary conditions used in the analysis of electronic parts, which requires a concurrent solution of the thermal behaviour of the whole system.

This year THERMINIC will address in addition to the "traditional" thermal management problems, also stress and thermal-stress-related-reliability issues, both in micro- and opto-electronics fields. These issues, including various nanotechnology applications, are of significant importance and of high interest to the engineering community engaged in the field of thermal phenomena in "high-tech" systems.

The Workshop is sponsored by the IEEE Components, Packaging, and Manufacturing Technology Society and by CMP.

AREAS OF INTEREST include, but are not limited to, the following topics:

- Thermal and Temperature Sensors
- Thermal Simulation
- Electro-thermal Simulation
- Thermal Modelling & Investigation of Packages
- Reliability Issues
- High Temperature Electronics
- Heat Transfer Education
- Flow Visualisation Techniques
- Turbulence Modelling in Complex Geometries
- Defect and failure modelling
- Reliability evolution and prediction
- Multiphysics simulation
- Nanoengineering issues
- Education
- Measurement of Thermal Properties
- Acquisition and analysis of Thermal data
- Temperature Mapping
- Novel and Advanced Cooling Techniques
- Thermal Performance of Interconnects
- Heat Transfer Enhancement
- Validation of Thermal Software
- Coupled (Thermo-mechanical, Thermo-optical, etc.) Effects
- Thermal Stress: Theory and Experiment
- Thermal Stress Failures: Prediction and Prevention
- Nanotechnology Applications
- Noise control.

TECHNICAL PROGRAMME will include oral talks, poster presentations, a panel discussion, and invited talks given by prominent speakers.

Plenary invited talks:

- **Microscale heat transfer in single- and two-phase flows: scaling, stability, transition**
Gian Piero Celata, ENEA Institute of Thermal-Fluid Dynamics, Rome, Italy

Proper understanding of microscale transport phenomena is fundamental for the designer of microfluidic devices. For this reason, many studies have been conducted to analyse the behaviour of convective flow through microchannels, both in single-phase and in two-phase flow. The present talk is an attempt to critically analyse the available results for liquid single-phase and flow boiling heat transfer, trying to provide some sort of base note in the melisma of published data.

- **Microscale heat transfer techniques for heat sinks and compact heat exchangers**
Martine Baelmans, Katholieke Univ. Leuven, Belgium

Selected state of the art microscale heat transfer techniques are presented for use in heat sinks and heat exchangers. For direct liquid cooled heat sink applications, two advanced solutions for single-phase flow operation are discussed in detail: geometrical optimisation of microstructures and the use of flow unsteadiness. For two-phase flow in microchannels, the dynamics of a small-scale cooling loop are discussed related to portability and robustness.

Regarding compact heat exchanger applications, the effects of downscaling are discussed in terms of the penalties on hydraulic and thermal performance. Comparing the optimal design of heat sinks (minimal thermal resistance and gradients) and heat exchangers (maximal power density), different criteria for flow conditions and material properties emerge.

AUTHORS ARE INVITED to submit electronic papers describing recent work. Panel proposals are also invited. Papers may be extended summaries or full papers although preference will be given to full paper submissions. In either case, clearly describe the nature of the work, explain its significance, highlight novel features, and describe its current status. Submission will be electronically only. Only papers of PDF (.pdf) format can be submitted. Detailed information about the submission process will be made available on the THERMINIC Web site:

<http://cmp.imag.fr/conferences/therminic/therminic2010>

In case you experience any problems with the submission procedure, please contact the General Chair, Bernard Courtois, CMP, Grenoble, France. E-mail: THERMINIC@imag.fr

Accepted contributions will be included in Workshop Proceedings.

Submission extended deadline:

Notification of acceptance:

Submission of manuscripts for distribution at the Workshop:

14 May 2010

15 June 2010

08 September 2010

SPECIAL ISSUES AND SPECIAL SECTIONS of leading periodicals have been organised regarding the previous Workshops (Journal of Sensors and Actuators, Microelectronics Journal, IEEE Transactions on VLSI Systems, IEEE Transactions on Components and Packaging Technologies, Journal of Electronic Packaging). It is again expected to have special issues and special sections of leading periodicals as follow up of the Workshop 2010.

VENDORS AND BOOK EXHIBITIONS are invited to offer products in the scope of the Workshop to exhibit. Editors are invited to exhibit books.

VENUE: The workshop is hosted at the Novotel Barcelona City. Barcelona is the cultural, administrative, economic and historic capital of Catalonia province of Spain. The city is served by air, train, bus or boat and it flavours, sounds and smells, emphasized by awesome landscapes, will make your THERMINIC attendance unforgettable. More information: <http://www.bcn.es/turisme/english/turisme/welcome.htm> or <http://www.barcelonaturisme.com>

Check the **web site** for more information:

<http://cmp.imag.fr/conferences/therminic/therminic2010>

THERMINIC Workshop