THE WORKSHOP AT A GLANCE

Wednesday 29 September 2004

8.00 - 9.30
Registration

9.30 - 9.40
Welcome address

9.40 - 10.20
Invited talk 1: Micro and nanoscale thermal engineering of electronic systems

10.20 - 12.00
Session 1: High resolution thermal characterisation

→ 12.00 Break

12.30
Vendors' session

→ 13.30 Lunch

14.30 - 15.30
Session 2: Sensors

→ 15.30 Break

16.00 - 17.30
Panel: Design for cool-ability, from chip to system

17.30 - 19.00
Poster introductions and viewing session

→ 19.00 Cocktail

Thursday 30 September 2004

8.30 - 9.10
Invited talk 2: Femtosecond laser techniques for the thermal characterisation of layered nanoscale structures

9.10 - 10.50
Session 3: Transient thermal characterisation

→ 10.50 Break

11.20 - 12.30
Session 4: Thermo-mechanical characterisation

→ 12.30 Lunch

14.00 - 14.40
Invited talk 3: Enabling meso-scale thermal management technologies for next-generation microelectronics systems

14.40 - 15.20
Session 5: High heat flux thermal management

→ 15.20 Break

15.50 - 17.10
Session 5: cont'd

→ 17.20 Buses departure to Cannes

→ 18.00 Free time in Cannes

→ 20.00 Diner in the Restaurant "Le Méditerranée" in Cannes

→ 22.00
Buses departure to Sophia Antipolis

Friday 1 October 2004

9.00 - 9.40
Invited talk 4: General needs on nanoscale thermal metrology and the Japanese program on this subject

9.40 - 11.00
Session 6: Calibration and supporting hardware

→ 11.00 Break

11.30 - 13.10
Session 7: Thermal modelling

→ 13.10 Lunch

14.10 - 15.50
Session 8: Thermal modelling – order reduction

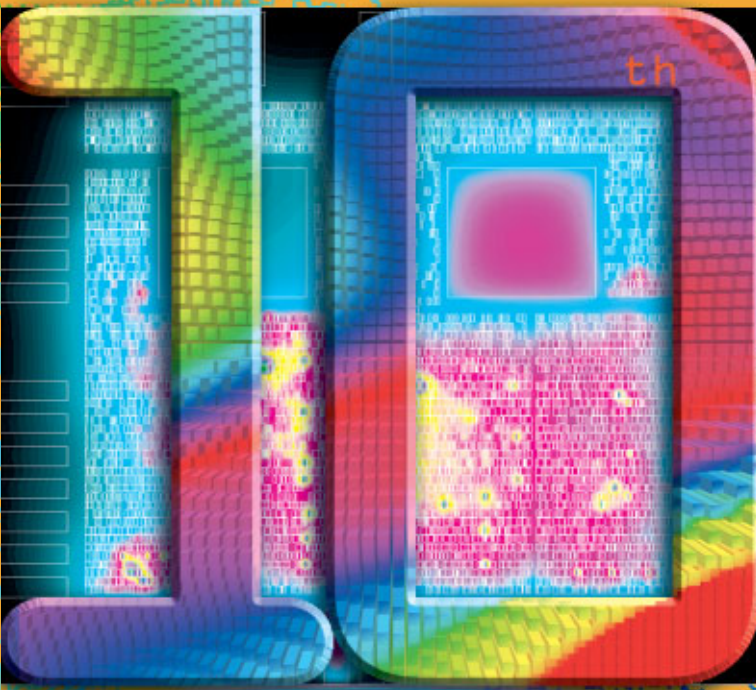
15.50
Closing remarks, coffee

Création Sirm Printed in France - Photos DR

PROGRAMME

INTERNATIONAL WORKSHOP ON THERMAL INVESTIGATIONS OF ICS AND SYSTEMS

29 sept
1 oct 2004
Sophia
Antipolis
Côte
d'Azur
France



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IEEE COMPUTER SOCIETY

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SOCIETY FRENCH CHAPTER

THERMINIC 2004

Electronic Workshop Registration form at:
http://tima.imag.fr/conferences/therminic/

Registration will be electronically only.

Detailed information about the registration process is available on the THERMINIC Web page. Authors should in addition notify their registration to the General Chair Bernard COURTOIS by email (THERMINIC@imag.fr).

Workshop advance registration and tutorial advance registration is applied if participant is registered and the payment is received before 27 August 2004.

	Advance Until 27 August 2004	**Late/On-Site After** 27 August 2004	**Sub-total**
IEEE/CS Member / Author / Committee Member Workshop registration fee	**450 Euros**	**520 Euros**	
Non-member Workshop registration fee	**550 Euros**	**650 Euros**	
Tutorials registration fee	**250 Euros**	**300 Euros**	
Cocktail and social event additional ticket	**90 Euros**	**90 Euros**	
Additional Proceedings (50 Euros/each)	**50 Euros**	**50 Euros**	

• Workshop registration fee covers admission to all sessions, the exhibition, coffee breaks, the cocktail, the dinner, and the Workshop proceedings.

• Tutorials registration fee covers admission to both tutorials on 28 September and documentation (unbreakable fee).

For payment by credit card (SA UNIVAL), please fill in the form below:

Please use BLOCK CAPITALS

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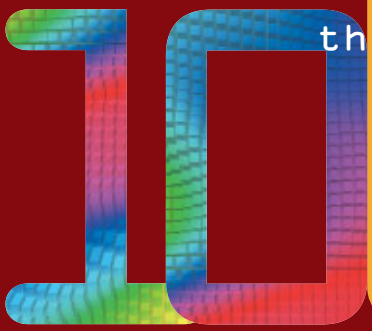
■ Refund policy for preregistration: there is a 80 € service charge for processing refunds. Requests for preregistration refunds must be received no later than 6 working days prior to the first day of the Workshop to be honoured. **No refunds will be issued after 20 September 2004.** Substitutions will be accepted at any stage.

The credit card form is to be returned to:

TIMA Laboratory/ THERMINIC 2004

46 Avenue Félix Viallet 38031 Grenoble cedex 1, France

Fax: +33 4 76 47 38 14



10th International Workshop on THERMal INvestigations of ICs and Systems

sponsored by by the IEEE Computer Society, Test Technology Technical Council and TIMA Laboratory in cooperation with the IEEE Solid-State Circuits Society French Chapter.

AIM OF THE WORKSHOP

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.

The main topics to be discussed during the Workshop are the following:

- Thermal and temperature sensors
- Measurement of thermal properties
- Thermal simulation
- Acquisition and analysis of thermal data
- Electro-thermal simulation
- Temperature mapping
- Thermal modelling and investigation of packages
- Novel and advanced cooling techniques
- Reliability issues
- Thermal performance of interconnects
- High temperature electronics
- Heat transfer enhancement
- Heat transfer education
- Validation of thermal software
- Flow visualisation techniques
- Coupled (thermo-mechanical, thermo-optical, etc.) effects
- Turbulence modelling in complex geometrics
- Thermal characterization

Previous THERMINIC Workshops have been held in Grenoble (1995), Budapest (1996), Cannes (1997 and 1998), Rome (1999), Budapest (2000), Paris (2001), Madrid (2002) and Aix-en-Provence (2003).

The programme includes 4 invited talks, oral and poster presentations and a panel. Oral contributions consist of 15 min. presentations followed by 5 min. discussion. The posters will be introduced by one slide in maximum 5 minutes each.

EXHIBITION

An exhibition will be held during the time of the Workshop. Tabletops or Spaces for a portable marketing stand 6sqm are available to companies interested to exhibit equipment, materials, software, etc. Booking of each table-top or Spaces for a portable marketing stand 6sqm will give one slot of time during the vendors' session. The number of spaces is limited. They will be offered on a first signed - first served basis. Contact the General Chair for more information.

SOCIAL EVENT ON 30 SEPTEMBER 2004

17.20 Buses departure to Cannes
17.40 Free time in Cannes

Each year beside various rendez-vous always very friendly dedicated to its members, the Yacht Club de Cannes organises numerous nautical activities. From 26 September to 3 October there is this year the "Régates Royales". We recommend you to walk along the Vieux Port de Cannes and take time to admire these boats before the diner.

20.00 Diner in the Restaurant "Le Méditerranée" in Cannes

A diner will be organized at the restaurant "Le Méditerranée" in Cannes "Côte d'Azur". On the westernmost point of the bay of Cannes, bordered by beach of fine sand and overlooking the yacht harbour and the Croisette.
The restaurant "Le Méditerranée" is a gourmet and panoramic restaurant offering the most beautiful overview of the bay of Cannes.

22.00 Buses departure to Sophia Antipolis

INFORMATION

More information on the Workshop is available from:

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TIMA Labs
46 Avenue Félix Viallet
38031 Grenoble cdx,
France
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Fax: +33 4 76 47 38 14
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Budapest University of Technology & Economics (BUTE)
Dept of Electron Devices
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H-1521 Budapest, Hungary
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Fax: +36 1 463 2973
E-mail: rencz@eet.bme.hu

INSURANCE

While the Workshop organisation makes every effort in order to ensure the safety and well being of all the Workshop participants and associates, the Workshop cannot take responsibility for any accident or damage that may occur during the Workshop.

WORKSHOP COMMITTEE

General Chair	**B. Courtois,** TIMA Labs, France
Vice General Chair	**M. Rencz,** BUTE, Hungary
Programme Chairs	**C. Lasance,** Philips, The Netherlands
	V. Székely, BUTE, Hungary

PROGRAMME COMMITTEE

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P. Tadayon	Intel/USA	S. Volz	Ecole Centr. Paris/France
P. Raad	South. Methodist U./USA	J. Parry	Flomerics/UK
P. Rodgers	CALCE Electronic Products and Systems Center/USA	C. Nicole	Philips/The Netherlands
		Y.C. Gerstenmaier	Siemens/Germany
A. Shakouri	U. of California/USA	W. Batty	U. of Leeds/UK
M-N. Sabry	U. Française d'Égypte/Egypt	J.B. Saulnier	ENSMA/France
I. Barsony	KFKI-ATKI/Hungary	V. Eveloy	Electronics Thermal Management, Mayo/Ireland
W. Claeys	U. Bordeaux/France		
G. Wachutka	TU München/Germany		

PROGRAMME

Tuesday 28 September 2004

TUTORIALS

Professional Development Courses/Tutorials are being offered on Tuesday 28 September from 10.00 to 17.00. Registrations will be guarantied on a first come first serve basis, upon maximum capacity is reached.

10.00 - 12.00 MICROSCALE HEAT TRANSFER IN ELECTRONICS THERMAL MANAGEMENT

Kenneth E. Goodson, Stanford Univ., USA

Tutorial objectives:

- Introduce the many different areas of electronics (interconnects, naotransistors, advanced heat sinks) where microscale heat transfer is important.
- Introduce the state of the art of microscale & nanoscale temperature and thermal conductivity measurements as applied to electronic systems.
- Introduce the physics and simulation/modelling techniques appropriate for microscale heat transfer in electronic systems.

About K. Goodson:

Ken Goodson is an Associate Professor of Mechanical Engineering at Stanford University. He is a founder and former CTO of Cooligy, a silicon valley startup which has grown to 35 employees working on electroosmotic microchannel cooling systems for integrated circuits. After receiving the Ph.D. in Mechanical Engineering from MIT in 1993, Goodson worked with the Materials Research Group at Daimler-Benz AG on the thermal design of

power circuits. In 1994 he joined Stanford, where his research group now includes twenty students and research associates. He has authored more than 120 journal and conference papers and five book chapters and has been recognized through the ONR Young Investigator Award and the NSF CAREER Award as well as Best Paper Awards at SEMI-THERM (2001), the Multilevel Interconnect Symposium (1998), and SRC TECHCON (1998). Goodson was a 1999 Outstanding Reviewer for the ASME Journal of Heat Transfer and a 1996 JSPS Visiting Professor at the Tokyo Institute of Technology.

14:00-17:00 THERMAL MEASUREMENTS AND QUALIFICATION USING THE TRANSIENT METHOD: PRINCIPLES AND APPLICATIONS

András Poppe, BUTE, Budapest, Hungary

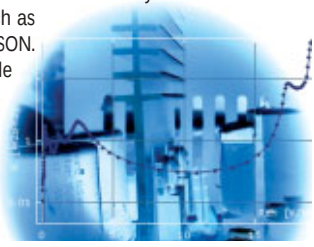
The tutorial covers advanced topics selected from the field thermal measurement of microelectronic structures and MEMS devices and some other types of measurements using the so called transient method. The transient method is based on capturing the real-time thermal transients completed with sophisticated mathematical algorithms to evaluate the measurement results. The evaluation procedure discussed in details is the NID method (network identification by deconvolution). The tutorial will "de-mystify" the famous structure functions – through practical examples it will be shown how they are used in real applications.

The tutorial would include, but will not be limited to the following topics:

- Thermal transient testing: measurement methods and available tools.
- Evaluation of thermal transients (heating/cooling curves) by the NID method: time-constant spectra, structure functions, RC models derived from transient curves.
- Structure functions as models of the physical structure. Using structure functions for heat-flow path reconstruction and for modeling purposes
- Principles of structure function based thermal property measurements and some application examples such as
  - TIM characterization
  - Principles of RthJC measurements with the transient method
- Non-destructive structure analysis: advanced case studies (e.g. investigation of state-of-the-art stacked die packages, study of high power LED-s)
- How to account for heat-losses via parallel heat-flow paths when using the structure function based methods.

About A. Poppe:

András Poppe is an associate-professor at Budapest University of Technology & Economics, Department of Electron Devices. He is also one of the co-founders if MicReD. Formerly he carried out research in the field of physical device modeling and curcuit simulation. Since the mid 90-ies he has been dealing with thermal issues in microelectronics and MEMS. He contributed to the development of thermal and electro-thermal simulation tools as well as to dedicated software tools used for the evaluation of thermal transient measurements. He has been actively involved in major EU-funded research projects such as BARMINT, THERMINIC, PROFIT or REASON. In the REASON project he is responsible for the thermal workpackage. As such, in the recent years he had a number of successful tutorials. András Poppe is co-author of over 80 scientific publications, most of which deal with thermal issues in microelectronics.



Wednesday 29 September 2004

08.00 Registration

09.30 Welcome session

B. Courtois, TIMA Labs, Grenoble, France

9.40 - 10.20

Invited talk 1: MICRO AND NANOSCALE THERMAL ENGINEERING OF ELECTRONIC SYTEMS

K. E. Goodson, Stanford Univ, USA

Chair: B. Courtois, TIMA Labs, Grenoble, France

10.20 - 12.00

Session 1: HIGH RESOLUTION THERMAL CHARACTERISATION

Chair: W. Claeys, Univ. Bordeaux, France

10.20 **NON-CONTACT, TRANSIENT TEMPERATURE MAPPING OF ACTIVE ELECTRONIC DEVICES USING THE THERMOREFLECTANCE METHOD**

M. Burzo, P.I Komarov, P. Raad, SMU, Dallas, USA

10.40 **A NEW PICOSECOND THERMOREFLECTANCE TECHNIQUE FOR THERMAL DIFFUSIVITY MEASUREMENTS OF NANOSCALE METAL THIN FILMS**

N. Taketoshi, T. Baba, Nat. Metrology Institute of Japan, Tsukuba, Japan

11.00 **THERMAL CHARACTERIZATION OF METALIC THIN FILMS USING PHOTOTHERMAL METHOD BASED NANOSECOND PULSED LASERS.**

J. Martan, NTC/Univ. of West Bohemia, Czech Republic

N. Semmar, Ch. Leborgne, GREMI, Univ.d'Orléans, France

11.20 **CONTRIBUTION OF SCANNING PROBE TEMPERATURE MEASUREMENTS TO THE THERMAL ANALYSIS OF MICRO-HOTPLATES**

L. Thiery, A. Odaymat, FEMTO-ST/Univ. de Franche-Comté, Belfort, France

D. Briand, Institute of Microtechnology, Neuchâtel, Switzerland

11.40 **THERMO-OPTIC MODULATION OF POROUS SILICON MICROCAVITIES**

L. Moretti, DIMET/Univ. of Reggio Calabria, Italy

L. De Stefano, I. Rendina, IMM/CNR, Naples, Italy

A. M. Rossi, IEN, Torino, Italy

12.00 BREAK

12.30 - 13.30

VENDORS' SESSION

Chair: B. Courtois, TIMA Labs, Grenoble, France

13.30 LUNCH

14.30 - 15.30

Session 2: SENSORS

Chair: A. Napieralski, TU Lodz/Poland

14.30 **A CMOS PROPORTIONAL-TO-ABSOLUTE TEMPERATURE REFERENCE FOR MONOLITHIC TEMPERATURE SENSORS**

C-M. Chang, H. Chiueh, NCTU, HsinChu, Taiwan

14.50 **HEAT FLUX SENSOR ARRAY FOR PACKAGE CHARACTERIZATION**

E. Kollar, V. Székely, BUTE, Budapest, Hungary

M. Adam, MFA, Budapest, Hungary

M. Rencz, Micred, Budapest, Hungary

15.10 **INVESTIGATIONS ON THE DYNAMIC THERMAL BEHAVIOUR OF MINIATURIZED PHOTOACOUSTIC GAS DETECTORS**
M. Salleras, J. Samitier, S. Marco, Univ. de Barcelona, Spain
O. Schulz, G. Müller, EADS/CRC, Munich, Germany

15.30 BREAK

16.00 - 17.30
PANEL: DESIGN FOR COOL-ABILITY, FROM TO SYSTEM

Moderator: M-N. Sabry, Univ. Française d'Egypte, Cairo, Egypt
Panelists:
F. Bellosa, Univ. of Erlangen-Nuerenberg, Germany
H. Jaouen, ST Microelectronics, Crolles, France
K. Skadron, Univ. of Virginia, USA

In parallel to seeking more efficient and sophisticated cooling technologies, it is perhaps wise to ask the simple question: Do we really need that amount of cooling?!
In fact, smart designs using dynamic thermal management can allow workload distribution such as to avoid hot spots, by separating critical blocks in space and/or time. This spreading in space and time reduces the cooling power required. It also has a favourable incidence on reliability since it tends to produce less temperature gradients. By bringing together people from various backgrounds (designers, system builders and university researchers) we hope to be able to explore various opportunities and challenges about this new design approach: "design for cool-ability" at different architectural levels from the processor and up to the data center.

17.30 - 19.00
POSTER INTRODUCTION AND VIEWING SESSION

Chair: M. Rencz, BUTE, Budapest, Hungary

17.30 **FAST THERMAL TRANSIENT ANALYSIS AND MACRO-MODEL CREATION USING MULTI-DIMENSIONAL MODEL ORDER REDUCTION**
M. Brajtman, P. Gunupudi, D. Celo, T. Smy, M. Nakhla, Carleton Univ., Ottawa, Canada

17.35 **A STRUCTURE ORIENTED COMPACT THERMAL MODEL FOR MULTIPLE HEAT SOURCE ASICS**
A. Augustin, A. Kostka, TU of Darmstadt, Germany
B. Maj, Continental Teves, Mixed Signal IC Development, Germany

17.40 **SIMULATING FINE-GRAIN THERMAL BEHAVIORS ON VLSIS**
M. Ito, R. Egawa, K. Sano, K. Suzuki, T. Nakamura, Tohoku Univ., Japan

17.45 **COUPLED ELECTRO-THERMAL SIMULATION FOR PCR SILICON CHIP**
O. T. Nedelcu, M. Simion, I. Kleps, A. Angelescu, M. Miu, NIRDM, Bucharest, Romania

17.50 **ELECTRO-THERMAL SIMULATION: IGBT IN SHORT-CIRCUIT OPERATING MODE**
L. Mussard, PEARL-LAAS, Toulouse, France
P. Tounsi, P. Austin, J-M. Dorkel, LAAS, Toulouse, France
E. Antonini, PEARL-ALSTOM-LAAS, Toulouse, France

17.55 **NONUNIFORM JUNCTION TEMPERATURE DISTRIBUTION IN HIGH VOLTAGE SILICON DIODES OPERATING ABOVE 150 C**
V. Obreja, C. Codreanu, M. Avram, NIRDM, Bucharest, Romania

18.00 **TEMPERATURE DEPENDENT MODEL OF ION SELECTIVE TRANSISTOR FOR MULTIDOMAIN SIMULATIONS**
M. Janicki, M. Daniel, A. Napieralski, TU of Lodz, Poland

18.05 **APPLICATION OF STRUCTURE FUNCTIONS FOR THE TRANSIENT THERMAL ANALYSIS OF GAN-BASED LEDS WITH SIC AND SAPPHIRE SUBSTRATES**
W. J. Hwang, M. W. Shin, Myong Ji Univ., Yongin-Si, Korea
P. Szabo, G. Farkas, Micred, Budapest, Hungary

18.10 **THE METHOD OF LINEAR DISTORTIONS ELIMINATION IN PHOTOACOUSTIC INVESTIGATION OF HIGH POWER THYRISTOR STRUCTURE**
Z. Suszynski, R. Duer, R. Arsoba, TU of Koszalin, Poland

18.15 **THERMAL INVESTIGATION OF ELECTROCHEMICAL CAPACITORS FOR ENERGY STORAGE**
P. Guillemet, Y. Scudeller, T. Brousse, LGM/Ecole Polytech. de l'Univ. de Nantes, France

18.20 **EVALUATION OF THE DISSIPATED POWER IN SMPS'S COMPONENTS THROUGH THERMAL MEASUREMENTS**
E. Dallago, G. Venchi, Univ. of Pavia, Italy

18.25 **NOVEL MATERIALS FOR IMPROVED QUALITY OF RF-PA**
Z. Radivojevic, K. Andersson, L. Bogod, J. Rantala, Nokia Research Center, Helsinki, Finland
M. Mahalingam, Motorola, Tempe, USA
J. Wright, Motorola, Oulu, Finland

18.30 **NEW ZONAL LES AND NON-LINEAR URANS MODEL VARIANTS WITH APPLICATION TO A COMPLEX GEOMETRY FLOW**
Y. Liu, P. Tucker, Univ. of Wales, Swansea, UK

18.35 **EVALUATION OF THERMAL IMAGING AND SIMULATION APPLICABLE TO TESTING OF PRINTED BOARD ASSEMBLIES**
M. Karlsson, U. Persson, D. Haglund, Mid Sweden Univ., Östersund, Sweden

19.00 COCKTAIL

Notes

Thursday 30 September 2004

08.30 - 09.10

Invited talk 2: FEMTOSECOND LASER TECHNIQUES FOR THE THERMAL CHARACTERISATION OF LAYERED NANOSCALE

W. Claeys, Bordeaux Univ., France

Chair: V. Szekely, BUTE, Budapest, Hungary

09.10 - 10.50

Session 3: TRANSIENT THERMAL CHARACTERISATION

Chair: J. Janssen, Philips, Eindhoven, The Netherlands

09.10 **RESULTS AND ISSUES IN THE MEASUREMENTS OF 3D STACKED DIE PACKAGES**

M. Rencz, A. Poppe, Micred, Budapest, Hungary

V. Szekely, BUTE, Budapest, Hungary

09.30 **TRANSIENT JUNCTION-TO-CASE THERMAL RESISTANCE MEASUREMENT METHODOLOGY OF HIGH ACCURACY AND HIGH REPEATABILITY**

P. Szabo, G. Farkas, MicReD, Budapest, Hungary

M. Lenz, Infineon, Nijmegen, Germany

09.50 **THERMAL WAVE INSPECTION OF MULTILAYER STRUCTURE WITH BEAM DISPLACEMENT MODULATION**

Z. Suszynski, R. Arsoba, TU of Koszalin, Poland

10.10 **FAST TRANSIENT THERMAL CHARACTERISATION OF POWER DEVICES**

A. Castellazzi, Munich Univ. of Technology, Germany

M. Honsberg-Riedl, Siemens, Munich, Germany

G. Wachutka, Munich Univ. of Technology, Germany

10.30 **STRUCTURED INTERFACES AND MATERIALS FOR THERMAL MANAGEMENT OF MICRO-SYSTEMS**

Y. Scudeller, P. Guillemet, T. Brousse, LGM/Ecole Polytechnique de l'Univ. de Nantes, France

10.50 BREAK

11.20 - 12.30

Session 4: THERMO-MECHANICAL CHARACTERISATION

Chair: H. Pape, Infineon, Nijmegen, Germany

11.20 **AN EXPERIMENTAL INVESTIGATION INTO THE CREEP BEHAVIOUR OF PRESSURE SENSITIVE ADHESIVE TAPES FOR AIR-COOLED COMPONENT-HEAT SINK ASSEMBLIES**

P. Rodgers, C. Hillman, Univ. of Maryland, College Park, USA

V. Eveloy, Electronics Thermal Management Ltd., Mayo, Ireland

11.40 **BOW-FREE ASSEMBLY: PREDICTED STRESSES**

E. Suhir, Univ. of California at Santa Cruz, USA

12.00 **NONLINEAR MODELLING AND ANALYSIS OF AN ELECTROSTATICALLY ACTUATED MICROSENSOR DIAPHRAGM SUBJECTED TO HIGH TEMPERATURE ENVIRONMENT**

W. Faris, International Islamic Univ., Kuala Lumpur, Malaysia

A. Nayfeh, Virginia Polytechnic Institute and State Univ., Blacksburg, USA

12.30 LUNCH

Thursday 30 September 2004

14.00 -14.40

Invited talk 3: ENABLING MESO-SCALE THERMAL MANAGEMENT TECHNOLOGIES FOR NEXT-GENERATION MICROELECTRONICS SYSTEMS

S.V. Garimella, Purdue Univ., West Lafayette, USA

Chair: C. Lasance, Philips, Eindhoven, The Netherlands

14.40 - 17.10

Session 5: HIGH HEAT FLUX THERMAL MANAGEMENT

Chair: G. De Mey, Ghent Univ., Belgium

14.40 **SELECTIVE COOLING OF MICROELECTRONIC USING ELECTROSTATIC ACTUATED DROPLETS - MODELLING AND EXPERIMENTS**

H. Oprins, IMEC/Katholieke Univ. Leuven, Belgium
B. Vandevelde, E. Beyne, G. Borghs, IMEC, Leuven, Belgium
M. Baelmans, Katholieke Univ. Leuven, Belgium

15.00 **INVESTIGATION OF COPPER FOAM COLDPLATES AS A HIGH HEAT FLUX ELECTRONICS COOLING SOLUTION**

S. Wilson, Y. Joshi, Georgia Institute of Technology, Atlanta, USA
B. Rozenoyer, U. Kashalikar, Foster-Miller, Waltham, USA

15.20 BREAK

15.50 **ENHANCED BOILING HEAT TRANSFER BY SUBMERGED ULTRASONIC VIBRATIONS**

S. Heffington, A. Glezer, Georgia Institute of Technology, Atlanta, USA

16.10 **FLUID FLOW AND HEAT TRANSFER PERFORMANCE TESTING ON MICROCHANNELS USING A NOVEL MODULAR TEST SYSTEM**

C. Eason, T. Dalton, M. Davies, Univ. of Limerick, Ireland
C. O'Mathúna, O. Slattery, NMRC, Cork, Ireland

16.30 **A METHOD FOR COMPARING HEAT SINKS BASED ON REYNOLDS ANALOGY**

A. Malhammar, Frigus Primore, Marseille, France

16.50 **ANALYSIS OF TWO PHASE MICRO-CHANNEL HEAT EXCHANGERS FOR HIGH HEAT FLUX ELECTRONICS COOLING**

P. Hegde, K. Seetharamu, G. Abdul Quadir, P. Aswathanarayana, M. Z. Abdullah, Z. A. Zainal, Univ. Sains Malaysia, Nibong Tebal, Malaysia

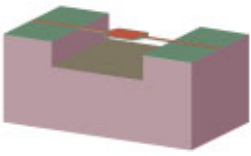
17.20 BUSES DEPARTURE TO CANNES

18.00 FREE TIME IN CANNES

20.00 DINER IN THE RESTAURANT
LE MEDITERRANEE IN CANNES

22.00 BUSES DEPARTURE TO SOPHIA ANTIPOLIS

Notes



PROGRAMME

Friday 1 October 2004

09.00 - 09.40

Invited talk 4: GENERAL NEEDS ON NANOSCALE THERMAL METROLOGY AND THE JAPANESE PROGRAM ON THIS SUBJECT

T. Baba, Nat. Metrology Institute of Japan, Tsukuba, Japan

Chair: P. Rodgers, CALCE Electronic Products and Systems Center, College Park, USA

09.40 - 11.00

Session 6: CALIBRATION AND SUPPORTING HARDWARE

Chair: P. Raad, South. Methodist Univ., Dallas, USA

09.40 CALIBRATION PROCEDURE FOR AN IIR-LD EQUIPMENT USING A THERMAL TEST CHIP AND ANALITICAL MODEL

X. Perpinya, X. Jordà, F. Madrid, S. Hidalgo, D. Flores, M. Vellvehí, CNM, Bellaterra, Spain

N. Mestres, ICMAB, Bellaterra, Spain

10.00 HEAT FLUX MICRO-SENSOR CALIBRATION FOR ENERGY TRANSPORT CHARACTERISATION IN LOW PRESSURE PLASMA PROCESSES

N. Semmar, A-L. Thomann, R. Dussart, J. Mathias, GREMI/Univ. d'Orléans, France

V. Lang, NTC, Univ. of West Bohemia, Plzen, Ceská Republika

10.20 A DIGITAL CMOS CIRCUIT FOR REFLECTANCE THERMOGRAPHY

B. Charlot, K. Torki, TIMA Labs, Grenoble, France

G. Tessier, C. Filloy, D. Fournier, ESPCI, Paris, France

10.40 REAL-TIME ELECTRO-THERMAL MODEL RESOLUTION IN HARDWARE

J. Lacort, A. Dieguez, S. Marco, M. Puig, J. Samitier, Univ. de Barcelona, Spain

11.00 BREAK

11.30 - 13.10

Session 7: THERMAL MODELLING

Chair: J. Parry, Flomerics, Hampton Court, UK

11.30 HIGHER ORDER COMPACT THERMAL MODELS WITH ERROR CONTROL

M-N. Sabry, Univ. Française d'Egypte, Cairo, Egypt

11.50 PARAMETRIC MODEL REDUCTION TO GENERATE BOUNDARY CONDITION INDEPENDENT COMPACT THERMAL MODEL

L. Feng, Fudan Univ., Shangai, China

E. B. Rudnyi, J. Korvink, IMTEK/Univ. of Freiburg, Germany

12.10 PHYSICALLY-BASED COMPACT THERMAL MODELING --- ACHIEVING PARAMETRIZATION AND BOUNDARY CONDITION INDEPENDENCE

W. Huang, M. Stan, K. Skadron, Univ. of Virginia, Charlottesville, USA

12.30 THE EFFECT OF SPREADING RESISTANCE AND TOPOLOGY ON THE BOUNDARY CONDITION INDEPENDENCE OF COMPACT THERMAL MODELS

K. Karimanal, Fluent, Lebanon, USA

12.50 HYBRID MICRO-NANO STRUCTURED THERMAL INTERFACE

S. Launay, A. Fedorov, J. Joshi, Georgia Institute of Technology, Atlanta, USA

A. Cao, P. Ajayan, Rensselaer Polytechnic Institute, New York, USA

13.10 LUNCH

14.10 - 15.50

Session 8: THERMAL MODELLING - ORDER REDUCTION

Chair: G. Wachutka, TU München, Germany

14.10 **A NOVEL APPROACH FOR GENERATING BOUNDARY CONDITION INDEPENDENT DYNAMIC COMPACT THERMAL MODELS OF PACKAGES**
L. Codecasa, D. D'Amore, P. Maffezzoni, Politecnico di Milano, Italy

14.30 **MULTI-POINT MOMENT MATCHING REDUCTION OF THERMAL MULTI-PORTS USING PORT TEMPERATURES**
L. Codecasa, D. D'Amore, P. Maffezzoni, Politecnico di Milano, Italy

14.50 **MODEL ORDER REDUCTION FOR LINEAR CONVECTIVE THERMAL FLOW**
Ch. Moosmann, E. Rudnyi, A. Greiner, J. Korvink, IMTEK/Univ. of Freiburg, Germany

15.10 **THE USE OF CONSTANT HEAT FLOW PORTS FOR THERMAL MACRO-MODELS**
X. Guo, D. Celo, D.J. Walkey, T. Smy, Carleton Univ., Ottawa, Canada

15.30 **ELECTRO-THERMAL SIMULATION OF MULTI-CHIP-MODULES WITH NOVEL TRANSIENT THERMAL MODEL**
Y. Ch. Gerstenmaier, Siemens, Munich, Germany
A. Castellazzi, G. Wachutka, Munich Univ. of Technology, Germany

15.50 **CLOSING REMARKS, COFFEE**
B. Courtois, TIMA Labs, Grenoble, France

Notes

VENUE

The Workshop will be held in the Sophia Country Club Grand Hotel Mercure. Sophia Country Club Grand Hotel Mercure is situated in a 30-acre landscaped park in the heart of the Valmasque forest.
http://www.toprivierahotels.com/htgb/frameset.htm

SOPHIA COUNTRY CLUB
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ACCESS

At 15 minutes from Cannes and from Nice Côte d'Azur international airport, poised between the sea and the hills, Sophia Country Club Grand Hotel Mercure is a haven of greenery in the very heart of Sophia Antipolis, the world-famous site for business and leisure.

- At 15 minutes from Cannes famous Croisette.
- At 10 minutes from the beaches of Juan les Pins.

How to get to Sophia Antipolis?
(http://www.tourisme-valbonne.com)
By plane: http://www.airfrance.fr/
The Nice Côte d'Azur airport is only 20 minutes from Valbonne Sophia Antipolis.
By train: http://www.sncf.com/
The SNCF runs trains to Cannes, Antibes and Nice, all close to Valbonne Sophia Antipolis. There is a bus service from the station at Antibes to Valbonne Village and Sophia Antipolis.
By car: Whether you are coming from the east (Nice-Italy) or the west (Marseille), take the A8 motorway and turn off at the Antibes or Cannes exit.
You can also take the main road called the "Route Napoléon" from the north of Grasse.

HOTEL INFORMATION

Blocks of rooms have been reserved in the Sophia Country Club Grand Hotel Mercure. September is a high season in Sophia Antipolis so early reservation is recommended (before 28 August 2004) using the appropriate form. Reservation will be on a first-come first-served basis. There is no obligation to stay at the Sophia Country Club Grand Hotel Mercure.

THERMINIC 2004

Hotel reservation form

28TH SEPTEMBER TO 1ST OCTOBER 2004

Room Type	Arrival (date and time)	Departure (date and time)	Nr. of nights

Price per room & night: **Standard room**
Single room: 144 € ➤ Double: 158 € ➤ Buffet Breakfast, per person: Included ➤ Privilege room supplement: 40 € per room
Visitor tax 0.75 €/per person per day

Deadline of reservation: 28 August 2004. After this date reservation accommodation will be confirmed only upon Hotel availability.

Please use BLOCK CAPITALS

Last Name : .....

First Name : .....

Organisation : .....

Address : .....

.....

Country : .....

Tel: ..... Fax: .....

Email: .....

Credit card type : AX/CB/VS/DC/MC

Credit Card N°

Expiry Date:

Name of Cardholder: ..... **Total** ..... €

Date / Signature:

Cancellation policy:
1 night will be charged in cased of cancellation or no show.
Reservation will not be accepted without credit card information.

The form is to be returned to:

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