Advanced Packaging Materials Conference (APM)

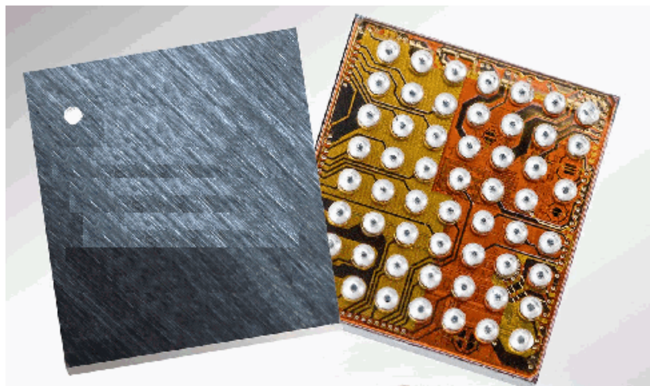
(Incorporating Polytronic)

co-located with

MicroTech-2010

http://apm-microtech.gre.ac.uk/

28th February – 2nd March 2010, Cambridge, England



The IEEE-CPMT Advanced Packaging Materials (APM) and IMAPS-UK MicroTech-2010 will be the major Spring 2010 Conferences on Electronics packaging, interconnection, integration in Europe.

APM featuring advanced polymer, organic and inorganic materials & **MicroTech-2010** featuring Disruptive Technologies, will be co-located at the well known University of Cambridge Møller Centre. The location is ideally placed near many forward-thrusting companies as well as at a great historic city.

Short Courses will be held on 28th February

Accommodation

The Møller Centre and a number of local hotels provide very good quality accommodation adjacent to the venue. For information please visit the website http://www.mollercentre.co.uk

Travel

To travel to the Møller Centre check the website (http://www.mollercentre.co.uk/location/index.html)

Conference Officers

Conference Secretariat: Vicky Holland (secretariat@imaps.org.uk)

Conference Co-Chairs:

Nihal Sinnadurai	Chris Bailey	Andrew Holland
Chief Executive, ATTAC	University of Greenwich	CSR plc
sinnadurai@aol.com	c.bailey@gre.ac.uk	andrew.holland@csr.com

Short Courses – Sunday 28th February

Venue: the Conference Centre at the Møller Centre, University of Cambridge

All Courses 10.00 – 13.00

Registration and Coffee 09.00 – 10.00

1. Your package is leaking!
- the invalidity of current hermeticity standards for small microelectronics packages.

Instructor(s): Prof. Marc Desmulliez, Ms. Suzanne Millar, Microsystems Engineering Centre (MISEC), Heriot-Watt University

Importance of topic: Hermeticity is vital for many types of devices. As packages reduce in size, a better understanding of the hermeticity test is required as it has been demonstrated that for very small cavities the traditional tests can lead to erroneous conclusions on the long term hermeticity of a package. Near-hermetic packaging is sufficient for some applications and can provide serious benefits in stress reduction which can outweigh the drawbacks of a higher leak rate and consequently shorter lifetime. It is still necessary to know the leak rate of these packages but current test methods such as the helium fine leak method are not suitable. It is therefore vital for all packaging specialists to fully understand the limits of current leak tests and why these tests do not provide definitive conclusions on the hermeticity of their packaging solutions and the long term reliability of the packaged devices.

Content: What is hermetic packaging and why is it needed • Understanding the traditional test methods and standards • Taxonomy of commercially used leak tests • Helium fine leak test • Radioisotope fine and gross methods • Optical leak detection • Cumulative helium leak detection (CHLD) • What's the problem with these methods? • Cavity volume limitations • Minimum detectable leak rate • Package material considerations • Presentation of potential solutions for your application • Application specific leak testing – an overview of applicable test methods for various package materials, cavity volumes and device types.

About the instructors Prof. Marc Desmulliez is the Director of the MicroSystems Engineering Centre (MISEC) which regroups 6 permanent academic members of staff and over 30 Ph.D. and Research Associates. The group is specialised in UV-LIGA processing, high level design of Microsystems and advanced packaging of MEMS. Prof. Marc Desmulliez was born in France, graduated from SUPELEC in Paris and studied in London, Cambridge and Heriot-Watt University, Edinburgh, Scotland.
Ms. Suzanne Millar graduated from Heriot-Watt University in 2004 with a masters degree in physics and is currently working towards an Engineering Doctorate. She has researched helium leak testing for over 3 years and works in collaboration with MCS Ltd, specialists in the analysis of failure modes in microelectronics.

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2. Basics of Qualification of Electronics, Photonics and MEMS

Instructor **Prof. Nihal Sinnadurai**

Importance: Many organisations are unaware of what is required when they seek to develop and assure the reliability of their products. Many may invoke generic published standards without understanding the relevance to their technologies or the intended applications.

Content: This short course provides the participants with the theoretical and the experimental basics they must understand in order to get to grips with reliability. The course develops a summary of the maths and models and moves quickly to explaining the actual reliability tests that are undertaken and the relevance of sample sizes in arriving at meaningful results. Included in the coverage are: the use and interpretation of the Arrhenius model and methods • the HAST model, methods and constraints • examples of pitfalls • illustrations of the consequences of doing it wrong • guidelines to solutions for effective and cost-effective reliability assurance including the Building Block approach to qualifying products and systems.

About the Course Tutor: The Course Tutor, Nihal Sinnadurai, is a practitioner in reliability having established skills within the teams he has led in industry. Through his technical leadership and mentoring of his reliability teams he has, for example, as VP and Corporate Director of Bookham Technology received the Gold Award for reliable product from Huawei, the Best Supplier award from Nortel Networks and led the company to high throughput of reliability products.

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3. Thermal Management in Electronics

Instructor Professor Chris Bailey

Importance: Extracting heat from electronic systems has always been a challenging task for electronic package designers. Ever increasing miniaturisation and functionality of Microsystems packaging technologies is resulting in increased power densities that current thermal management techniques are finding difficult to manage. Environmental factors are forcing companies to broaden their view of thermal management as energy management, where industry is being driven to minimise the amount of energy required to keep electronic systems cool

Content: The course will describe both current capabilities and future requirements for passive and active cooling technologies. Modeling technologies which can be used by designers to predict optimal thermal/energy management solutions will also be discussed. The course contents will include • Basics of Heat Transfer • Natural and Forced Convection • Passive Cooling Technologies • Active Cooling Technologies • Modelling Tools & Computational Fluid Dynamics • Thermal Stresses • Future Challenges.

The Tutor: Chris Bailey is Professor in Computational Mechanics and Reliability at the University of Greenwich, UK. He has published over 200 papers on Design and Simulation of micro-technology based processes and products and has worked on many UK and EU projects and consulted with many companies including thermal management companies such as Flomerics. Chris is a member of the NAFEMS Multi-Physics Modelling working group, a Senior member of IEEE, and a Committee member of IMAPS-UK. In 2006 he was a member of a UK Government Mission on Thermal Management Technologies to the USA

MicroTech-2010

featuring

Disruptive Technologies

MicroTech-2010 Programme – Monday 1st March 2010

Venue: the Conference Centre at the Møller Centre, University of Cambridge

Coffee & Registration 08.00 – 09.30

Disruptive Technology Keynotes 1 & 2 (9:30 – 10:30)

Disruptive Technologies, Prismark Partners, USA

MEMS packaging and assembly in Harsh Environments; Colibrys, Switzerland

Disruptive Technology Keynotes 2 & 3 (11.00 – 12.00)

Disruptive Technology its Application in Mobile Devices; CSR plc, Cambridge, England

New Approaches Wafer-Level Chip-Scale Packaging; Lord Corporation, USA

Disruptive Technology in Advanced Packaging (13.30 – 15.10)

Fine Pitch Cu Wire Bonding, B. Appelt, ASE, USA

Development of Microvia Copper Electroplating Technology for SiP Applications, C. Fang, NXP, France

Active implantable electrodes: Micro-Manufacturing with embedded IC, A Vanhoestenberghe, UCL, London, England

Large 3D LTTC structures realised with sacrificial materials, M Hrovat, Ljubljana, Slovenia

Assembly and Packaging of Pyroelectric Arrays for People counting and thermal imaging applications, A Butler, Irisys, UK

Disruptive Technologies in Reliability (15.40 – 16.40)

Improving the Efficiency of Hermetic Packaging using Novel Gettering Solutions, S Catchpole, Johnson Matthey, UK

Investigation of Daisy Chain Resistance Monitoring Instruments and Failure Criteria in Board Level Solder Joint Reliability Tests, Jeff Lo & Ricky Lee, HKUST, Hong Kong

Advanced Reliability Testing of Embedded Passive Components for System-in-Package Applications, H Goddin, TWI , England

IMAPS-UK AGM (17:00 – 18:00)

Pre-dinner drinks, Conference Dinner, Social, (18.30 onwards)

Exhibition

A Table-top exhibition from leading companies in the field will be held throughout 1st & 2nd March
For further details please email secretariat@imaps.org.uk

Advanced Packaging Materials Conference (APM)

(Incorporating Polytronic)

APM (*with Polytronic*) is a major technical forum, providing opportunities to network, meet experts and exchange up-to-date packaging knowledge.

APM Programme – Tuesday 2nd March 2010

Venue: the Conference Centre at the Møller Centre, University of Cambridge

APM Keynotes 1, 2 & 3 (08.30 – 10:10)

Bespoke interconnect technologies for optoelectronic and biomedical products, Marc Desmulliez, Heriot-Watt University, Scotland

Wafer Level CSP & FlipChip Production Technology, Elke Zakel, PacTech, Berlin, Germany

Single Sided Substrates and Packages Based on Laminate Materials, Bernd Appelt, ASE, USA

Advanced Packaging Materials 1 (10:10 – 12:00)

Effect of Al and Zn alloying elements on Sn-3.8Ag-0.7Cu and Sn-3.5Ag solder alloys on the Cu and Ni(P) substrate, H Kotadia, KCL, London, England

Nano and Micro sized filler particles for improved humidity resistance of encapsulants, T Braun & R Aschenbrenner, Fraunhofer-IZM, Germany

Optimisation of stiffness for conductive materials, Chune Fu, Chalmers University of Technology, Gothenburg, Sweden

Graphite Nanoplatelet / Silicone Composites for Thermal Interface Applications, Mohsin Ali Raza, Institute for Materials Research, University of Leeds, England

Advanced Packaging Materials 2 (13.30 – 14.50)

A Novel Isotropic Conductive Adhesive with AG Flakes, BN and SiC Nanoparticles, Chalmers University, Sweden

Computational Modelling of Electrical Field Intensity for High Voltage Semiconductor Package Design, N. Nobeen, Loughborough University, England

Properties of Conductive Microstructures Containing Nano Sized Silver Particles, Jan Felba, Wroclaw, Poland

Thermal Management Using Infrared Thermography, P Mashkov, Bulgaria

APM Keynote 3 (15:20 – 15.50)

Reliability study for high temperature stable conductive adhesives, J Liu, Chalmers University

Reliability & Optoelectronics Materials (15:50 – 17:10)

Mitigation of tin whiskers with polymer coatings, C Hunt, National Physical Laboratory, England

Capacitive sensor for automotive engine oil degradation using wireless network, Jaedong Cho, Korea

Optical fibre array manufacture using electrostatic actuation, Heriot-Watt University, Scotland

Packaging of LED backlights for ruggedised displays, University of Greenwich, England

Sunday 28th February: **APM Short Courses are on the second page of this Programme Brochure**

APM/MicroTech 2010 – Booking Form
1st – 2nd March 2010 – Moller Centre, Cambridge

Please PRINT CLEARLY IN BLOCK CAPITALS USING BLACK INK.
Return the completed form to the IMAPS-UK Secretariat, E-mail: secretariat@imaps.org.uk
Post: 16 Pound Way, Swaffham Bulbeck, Cambridge CB25 ONL Fax: +44 (0)1223 813552 Tel: +44 (0)843 2898689

Name: **Title:** **IMAPS or IEEE Member Yes/ No**

IMAPS/IEEE Membership Type & No:

Company/ Organisation:

Address:

Telephone: **Fax:** **E-mail:**

Any dietary requirements for evening meal:

TWO DAY DELEGATE CONFERENCE RATES
(Includes Conference Dinner on Monday 1st March at the Moller Centre)

IMAPS or IEEE Member	£300.00	(£352.50 inc VAT)	☐
NMI Member	£340.00	£399.50 inc VAT)	☐
Non Member	£360.00	(£423.00 inc VAT)	☐
Speaker	£300.00	(£352.50 inc VAT)	☐
Student	£150.00	(£176.25 inc VAT)	☐

EXHIBITOR RATES 1st & 2nd March 2010
(Includes entrance for 1 person to the Conference
And dinner on Monday 1st March at the Moller Centre)

IMAPS-UK **Corporate** Member	£350.00	(£411.25 inc VAT)	☐
All Other Exhibitors	£500.00	(£587.50 inc VAT)	☐
Additional Exhibitor Delegate	£150.00	(£176.25 inc VAT)	☐

SHORT COURSE FEES
(Sunday 28th February 2010)

All Attendees	£ 150.00	(£176.25 inc VAT))	☐

PAYMENT OPTIONS

Invoice sent to: (Name & address if different to above):...

Cheque enclosed (made payable to IMAPS-UK) ☐

Credit Card – please ring 0843 2898689 for phone payment ☐
Or Fax to +44 (0)1223 813552: Credit Card Number, Expiry Date, Security Code, Billing Name, Billing Address

UK: BACS Payment – Sort Code: 20-17-35 Bank Account No: 63456285 ☐

International: IBAN: GB94 BARC 2017 3563 4562 85. Swift Code: BARCGB22 ☐

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