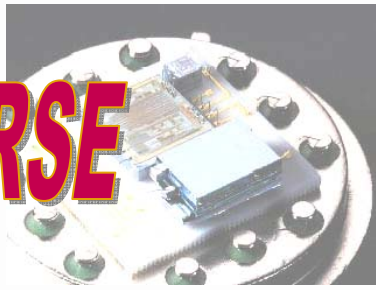
NETWORK of EXCELLENCE
DESIGN FOR MICRO & NANO MANUFACTURE
PATENT (DfMM)

DfMM NoE PATENT

www.patent-dfmm.org



NEW - DfMM TRAINING COURSE

Modelling & Analysis of MEMS Packages

A working knowledge of analysis tools and techniques is essential during the development of MEMS packages. This latest PATENT-DfMM course covers a wide range of methods of interest to current MEMS designers, and aims to give an introduction to engineers and scientists who have recently started work in this field.
After an introduction to current packaging techniques and technologies, the course will focus on experimental and simulation techniques. The experienced presenters will cover the following:

Introduction to MEMS Packaging Techniques and Technology
- Examples of MEMS applications for different markets
- Difference between Electronics and MEMS packaging strategies and requirements
- Assembly/Interconnection and Encapsulation
- Examples of MEMS packaging

Analysis Techniques for MEMS Packages
- Optical techniques for films/MEMS inspection and mechanical testing before packaging
- Testing techniques for wafer bonding and wafer level packaging
- Practical training: MEMS characterization by optical profilometry-vibrometry
- Hermeticity
- Mechanical strength
- Failure analysis techniques
- Reliability testing
- Testing approaches for submicron and nanomechanical material behaviour – A brief overview
- Deformation measurements at micro and nano scale by digital image correlation techniques (includes practical training)
- Residual stress measurements

MEMS Package Simulation Techniques
- Basic mechanics
- Material behaviour and characterisation
- Failure mechanisms and life time models (Failure Mechanics, Fracture Mechanics)
- Basic package MEMS interaction
- Practical Training

12-14 December 2005

at IEF, Paris

Presenters

Olaf Wittler, Fraunhofer IZM, Berlin
Alain Bosseboeuf, IEF, Paris
Ingrid De Wolf, IMEC, Leuven
Andrew Richardson, ULAN, Lancaster
Changhai Wang, HWU, Edinburgh

Course Fee

900 Euros per person + VAT

Fees include tuition, student notes, lunches and light refreshments. Discounts are available for PATENT students.

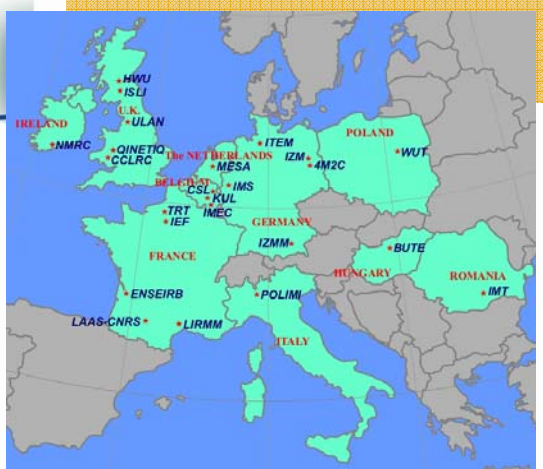
Delegates must submit a registration form (www.patent-dfmm.org/training/register.htm)

To register please contact:

Suzanne O'Hare, Marketing Executive, ISLI.
Direct Dial: +44 (0) 1506 469 303
FAX: +44 (0) 1506 469 301
Email: courses@sli-institute.ac.uk

Credit Card payment (VISA or MasterCard) preferred.

See over...



The "Design for Micro & Nano Manufacture (Patent-DfMM)" Network of Excellence aims to establish a new technical community targeting the underlying engineering science to ensure that problems affecting the manufacture and reliability of products based on MNT can be addressed before prototype and pre-production.

The work involves teams from the fields of packaging, test engineering, reliability engineering, simulation and modelling, drawn from 24 partner institutes and industries in Europe.

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About the course authors & presenters…

Dietmar Vogel studied physics and received his PhD degree in plasma physics from the St. Petersburg State University in 1980. Since 1993, he has been working with the Fraunhofer Institute for Reliability and Microintegration Berlin (IZM). He is heading the Fraunhofer Nanomechanics Lab Berlin Adlershof within the Micro Materials Center Berlin. His main research field is experimental micro and nano mechanics with emphasis to measurement techniques. Dietmar Vogel is member of IEEE. He has published approximately 100 papers, mainly regarding mechanical reliability of electronics packaging.

Olaf Wittler studied physics in Paderborn, Berlin and London. Afterwards he worked on his Ph.D. thesis at Robert Bosch GmbH (Corporate Research and Development), which involved the analysis of cracks in polymer encapsulations by means of experiment and simulation. On this work he received his Ph.D. in 2004 at TU Berlin. In 2002 he joined the Research Center for Microperipheric at TU Berlin to work on research projects in the field of thermomechanical reliability and simulation.

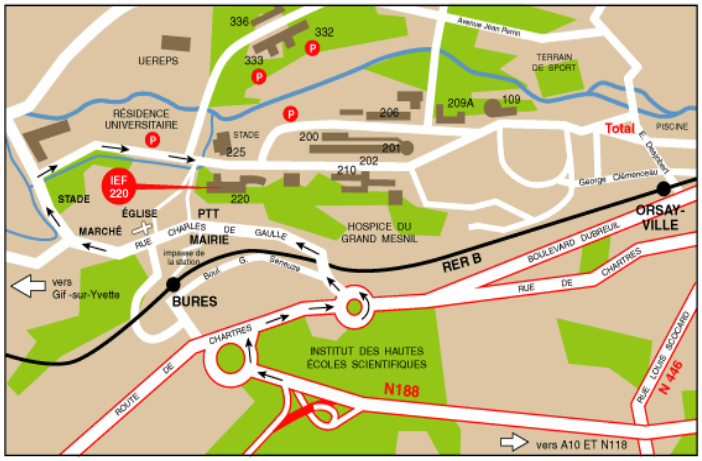
Bernhard Wunderle studied Physics in Tübingen/Germany, York/England and Salerno/Italy. In 1998 he received his diploma in theoretical physics from the University of Tübingen. From 1999 on he was with Robert Bosch Ltd, where he was concerned with reliability studies in advanced electronic packaging for automotive applications, for which he received his Ph.D. from the Technical University of Berlin in 2003. At Fraunhofer he currently leads a group working in the field of material characterisation and reliability in experiment and simulation. He is also responsible for the IZM thermal management program.

Alain Bosseboeuf is a full time senior researcher at Institut d'Electronique Fondamentale (IEF), a joint micro/nanotechnologies institute of the French National Center of Scientific Research (CNRS) and University of Paris South. He has more than 10 years' experience on ex-situ and in-situ characterization techniques for thin films and MEMS and has also been involved for a few years on the development of wafer-level packaging processes and testing techniques.

Ingrid De Wolf received the M. Sc. degree in Physics and the Ph.D. in Sciences, Physics, both from KU Leuven, Belgium. From September 1989 on she joined the Reliability group of IMEC. She worked in the field of reliability physics of semiconductor devices, with special attention for mechanical stress aspects and failure analysis. She authored or co-authored in these fields more than 100 publications in international scientific journals and in international conference proceedings. She authored two book chapters and a catalogue on the application of Raman spectroscopy for semiconductor materials, and won various best paper awards at conferences. From 1999 on, she heads the group Microsystem Reliability, where research is focused on reliability and failure aspects of MEMS and packaging.

Andrew Richardson is Professor at Lancaster University, heading the Centre for Microsystems Engineering. He is a member of the Foresight Vehicle Advanced Electronics Thematic committee, a committee member for the International IEEE Mixed-signals Testing Workshop, and the the IEEE conference on Design Automation in Europe. He is also Scientific Director for Dolphin Integration, France, and Coordinator of the PATENT-DfMM Network of Excellence.

Changhai Wang received a BSc degree in Electrical & Electronic Engineering from Jilin University, China; a MSc degree in Optoeletronic and Laser Devices and a PhD degree in low power all-optical switching devices and their application in all-optical logic circuits, both from Heriot-Watt University, Edinburgh, UK. He is currently a lecturer in electrical & electronic engineering in the School of Engineering & Physical Sciences at Heriot-Watt University. He has conducted research in optoelectronic materials and devices, flip chip technology and microsystems (MEMS) technology. His current research interests include fabrication and assembly of microstructures, RF MEMS devices, flip chip assembly, MEMS packaging and DNA microarray/biochip technology. He has developed several novel techniques for MEMS and IC assembly and packaging. He has published over 50 papers. He held a Royal Society of Edinburgh Enterprise Fellowship in Optoelectronics in 1997/1998.



Course Location
Institut d'Electronique Fondamentale
Université Paris Sud, Bât.220
15, rue Georges Clémenceau
91405 ORSAY, France
Tel: +33 (1) 69 15 76 12

Accommodation
A list of hotels is provided on the IEF webpage
http://pages.ief.u-psud.fr/seminaires/Hotel%20list.pdf

Please contact the hotel of your choice directly.

Notes
This is a 3 day course, although it may be possible to attend for a shorter time. In this case the fee will be 750 Euros (2 days) or 500 Euros (1 day).

A 10% administration fee is charged for cancellations made more than 2 weeks before the start of the course. Cancellations of 2 weeks or less will be liable to the loss of the full fee. Substitutions may be made at any time until the start of the course. ISLI reserves the right to cancel any course at short notice or to postpone or make necessary alterations to the content. If a course is cancelled by ISLI, course fees will be refunded in full however no liability is accepted for other expenses including changes to travel arrangements.

The course is presented in English.

Enquiries
Contact George Bell, PATENT Training Leader.
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Email: george.bell@sli-institute.ac.uk

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PATENT-DfMM training programme is coordinated by ISLI, the Alba Centre, Alba Campus, Livingston EH54 7EG
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Institute for System Level Integration