

Dear Reader,

The Network of Excellence (NoE) Patent-DfMM aims to establish a collaborative team to provide European industry with support in the field of "Design for Micro & Nano Manufacture (DfMM)" to

ensure that problems affecting the manufacturing and reliability of products based on micro & nano technologies (MNT) can be addressed before prototyping and production. For more information:

<http://www.patent-dfmm.org/>



Welcome to the new edition of our bi-monthly E-Newsletter, which will keep you updated on project related activities, but also on other DfMM activities that run outside of the project.

We apologise in case you have been added to our database in error: if so, please reply by e-mail with "UNSUBSCRIBE" in the subject field.

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www.patent-dfmm.org

We welcome your comments and contributions.

Happy reading!

Patric Salomon
NoE Patent-DfMM News Editor

In this edition:

News from the NoE Patent-DfMM

Industry participation in PATENT-DfMM projects

DfMM Course „Thermal Issues in MEMS”, 10-11 Jan 06 at Fraunhofer IZM, Berlin, Germany

"Technology Roadmapping event for Packaging of MOEMS and RF MEMS, 16 Feb 06, Edinburgh, UK

PATENT-DfMM - Short Questionnaire on your MNT COURSE needs

Abstract Deadlines for Conferences

Call for Papers: IMSTW'06 International Mixed-Signals Testing Workshop, 21 - 23 Jun 06, Edinburgh, UK

Call for Papers: MEMSWAVE 2006 & RF MEMS Cluster Meeting, 29 - 30 Jun 06, Orvieto, Italy

List of Events

Other DfMM-related News

[NEXUS Market Analysis for MEMS and Microsystems III, 2005-2009 available](#)
[Course "Automatic Compact Modelling for MEMS: Applications, Methods and Tools",](#)
[23 Apr 06, Como, Italy](#)
[Online Professional Training for the Electronics Industry at ISLI, UK, starting January](#)
[2006](#)
[Workshop "Mechanical Reliability of Silicon MEMS - Recent progress and further](#)
[requirements", 27-28 Feb 06, Halle/Saale, Germany](#)

News from the NoE Patent-DfMM

Industry participation in PATENT-DfMM projects

The EC FP6 Network of Excellence in Design for Micro & Nano Manufacture "PATENT-DfMM" is inviting proposals for activities that contribute to integration and spreading of excellence. The following projects are open for external organisations:

1. Proposals from SME's requesting support to access PATENT-DfMM project partners skills, facilities and services to achieve "proof of concept" or "prototype" demonstration. The scope of the work can include tools development, equipment development, device or system prototype, manufacturing support IP in the form of test functions, test chip or monitoring function prototype, support IP for robust / high reliability design, packaging solutions and integration technology. It is expected that all work funded will lead to an advance in the design for manufacture concept or its application to micro & nano technology based products. SME's will be expected to contribute to the sustainability of PATENT-DfMM. Funding requests must be to cover man-power at PATENT-DfMM Partner institutes and access to PATENT-DfMM partner facilities. Only projects that involve at least two PATENT-DfMM partners are eligible. 2006 budget: €37K.
2. Participation of external industries in PATENT-DfMM FLAGSHIP projects. PATENT-DfMM is inviting participation to the following Flagship projects for 2006 (total budget €515K):
 - Fault modelling for Fluidics & BioMEMS
Flagship project leader: H. Kerkhoff (H.G.Kerkhoff@utwente.nl)
 - Reliability methodology for MEMS (including chip on board work)
Flagship project leaders: Marius Bazu (MBazu@imt.ro) and Changhai Wang (C.Wang@hw.ac.uk)
 - Holistic Reliability Engineering for MEMS harsh conditions (including work on the influence of external vibrations and shock on the functioning and lifetime of microsystems)
Flagship project leaders: Khiem Trieu (trieu@ims.fraunhofer.de) and Ingrid De Wolf (dewolfi@imec.be)
 - Integrated Characterisation of Packaging Hermeticity Combining Test, Modelling, Reliability Characterisation and Packaging Integration of a Humidity Microsensor
Flagship project leaders: Orla Slattery (orla.slattery@tyndall.ie) and Claude Pellet, IXL (IPellet@ixl.u-bordeaux.fr)
 - Modelling, manufacturing, packaging and reliability testing of Microsystems for Health and Usage Monitoring of larger electronic systems "HUMS"
Flagship project leader: Marc Desmulliez (M.Desmulliez@hw.ac.uk)

Organisations interested in participating to these flagship programs should contact the appropriate FLAGSHIP PROJECT LEADERS before the 12 Jan 2006.

Funding will be available to PATENT-DfMM partners only but external organisations may benefit from close collaboration.

CALL deadline: 19 Jan 2006

For further information, please contact the flagship project leaders, or for SME proposals the PATENT-DfMM partner that you like to collaborate with, or: Andrew Richardson, E-mail:

A.Richardson@Lancaster.ac.uk, Patric Salomon, E-mail: patric.salomon@4m2c.com
www.patent-dfmm.org

DfMM Course „Thermal Issues in MEMS”, 10-11 Jan 06 at Fraunhofer IZM, Berlin, Germany- an intensive introduction to the significant effects of heat transfer, modelling and measurement

Some of the areas covered in this course:

·Heat transfer Basics and Modelling Techniques

(Analysis of Conduction - Basics of heat conduction and resistance; The concepts and simulation of compact models; Analysis of Radiation and Convection; Fluid properties and influence on convection; Viscosity, density, heat capacity, etc.; “Magic”numbers: Prandtl, Biot, Reynolds, Grashof, etc.;; Numerical modelling – Computational Fluid Dynamics, and Examples of CFD simulations)

·Testing Techniques

(Thermal Testing, Power Cycling, Test chips; Temperature measurement methods; Thermal Resistance of Interface Materials; Thermal transient testing by test equipment and by intelligent; thermal test chips; Driving point and transfer impedances; Time-constant spectra, complex loci of impedances; Results evaluation, Structure function based analysis; Case studies and hands-on demonstrations; Applicable JEDEC standards for package characterization)

·MEMS and NEMS Thermal Management

(Scaling effects on conduction & convection from Micro Scale to Nanoscale; Heat generation and dissipation in MEMS; Thermal and Thermoelastic actuators; Thermal cycling of fluids; Thermal management of electronic systems using MEMS; Microchannel cooling, Micro-pumps & Micro-fans)

Course Fee: € 450 + VAT,

To register please contact: Suzanne O'Hare, ISLI, UK, Email: courses@sl-i-institute.ac.uk

More information and registration www.patent-dfmm.org

Contact: George Bell, ISLI, UK, E-mail: george.bell@sl-i-institute.ac.uk

Technology Roadmapping event for Packaging of MOEMS and RF MEMS, 16 Feb 06, Edinburgh, UK

This event is part of the FP6 Network of Excellence Patent-DfMM "Design for Micro and Nano Manufacture". The event is free to attend and will be prepared by PATENT-DfMM WP 4 (Packaging) project partners. Mr Paul Palmer of the PRIME Faraday Partnership at Loughborough University, UK will facilitate it. Paul has years of experience of roadmapping in academia, industry and government. The day will aim at identifying technological trends, bottlenecks and investment opportunities in packaging of MOEMS and RF MEMS, in order to encourage the take up of MEMS by industry. During the workshop, a selection of projects and capabilities in packaging of MOEMS and RF MEMS will be carried out by applying roadmapping criteria for technology viability. The information gathered during the workshop will be processed after the day to produce the roadmap. To register and to get more information please visit: www.patent-dfmm.org

Contact: Fabien Holler, Heriot-Watt University, Edinburgh, UK; E-mail: f.holler@hw.ac.uk

PATENT-DfMM - Short Questionnaire on your MNT COURSE needs

The PATENT-DfMM workpackage “Training and Education” has recently started the development of a “Micro and Nano Technology-Engineering Business and Society course”. In order to continue providing the most relevant material in our course programs we would like to ask your opinion on the content of the course. We are aiming to gather information from both students and potential employers in order to maximize the employability of our graduates.

This survey is completely anonymous and the data would be used for statistical study only. However, if you wish to hear more about our MNT courses, please leave us your email address and we'll send you relevant information. At no stage will your information be passed on to any other organization.

This survey will take you through 4 simple steps, please follow this link to start

http://www.lancs.ac.uk/sci-tech/mnt_survey/ .

Contact: Denis K. Koltsov, Lancaster University, UK, E-mail: d.koltsov@lancaster.ac.uk

Abstract deadlines for conferences

Call for Papers: IMSTW'06 International Mixed-Signals Testing Workshop, 21 - 23 Jun 06, Edinburgh, UK

Submission Deadline: 27 February 2006

The IEEE International Mixed-Signals Testing Workshop (IMSTW) is a forum for discussing all aspects of testing, design-for-test and reliable design of integrated mixed-signals/mixed-technology functions and systems. This includes testing and design verification of monolithic mixed-signal/mixed-technology systems (SoC), heterogeneous systems including system-in-package and printed circuit board implementations of mixed signal functions. The technology spectrum includes analogue, mixed-signals, high-speed IO, RF, MEMS (inc. optics, bio-chemical and microfluidics), and nanotechnology. Test topics such as design-for-test techniques, BIST, fault diagnosis, test generation, on-line and off-line testing, fault modelling, fault simulation and design of fault tolerant systems are all considered. Mixedsignals infrastructure, embedded core testing and application specific topics are also welcome. The IMSTW Program Committee invites authors to submit papers in the above areas.

Contact: Andrew Richardson, Lancaster University, UK, E-mail: a.richardson@lancaster.ac.uk

Call for Papers: MEMSWAVE 2006 & RF MEMS Cluster Meeting, 29 - 30 Jun 06, Orvieto, Italy
Submission Deadline: 3 March 2006

The series of MEMSWAVE Workshops is presently organized by the AMICOM (Advanced MEMS For RF and Millimeter Wave Communications) Network of Excellence. The Workshop will provide an international forum for scientists and industrialists for the exchange of information on the most recent advances and best achievements in the area of RF MEMS with emphasis on European activities. The Workshop will be preceded (28 June) by the MEMS Cluster Meeting, a meeting organized by AMICOM in collaboration with the European Commission, where the achievement of MEMS-related EU projects will be presented and discussed. For more information please visit www.memswave2006.org.

Workshop on "Wafer Bonding for MEMS Technologies"

9 - 11 April 2006

Halle, Germany

Abstract Deadline: **9 January 2006**

www.microtesting.de

CANEUS 2006 - Conference on Micro-Nano-Technologies for Aerospace Applications

27 August - 1 September 2006

Toulouse, France

Abstract Deadline: **16 January 2006**

www.caneus.org/caneus06

IMSTW 2006 - International Mixed-Signals Testing Workshop

21 - 23 June 2006

Edinburgh, UK

Abstract Deadline: **27 February 2006**

www.comp.lancs.ac.uk

MEMSWAVE 2006

29 - 30 June 2006

Orvieto, Italy

Abstract Deadline: **3 March 2006**

www.memswave2006.diei.unipg.it

List of Events

10 - 11 January 2006

PATENT-DfMM Training Course "Terml Issues in MEMS"

Berlin, Germany

www.patent-dfmm.org

21 - 26 January 2006

MOEMS-MEMS 2006 Micro & Nanofabrication

San Jose, CA, USA

<http://spie.org/conferences/calls/06/pw/>

22 - 26 January 2006

MEMS 2006 International Conference on Micro Electro Mechanical Systems

Istanbul, Turkey

www.mems2006.org

26 - 27 January 2006

Third MINAEAST Workshop

Villard de Lans, France

<http://www.minaeast.net/gren/formular/index.php>

1 March 2006

MEMUNITY Workshop "Testing MEMS on Wafer-Level"

Halle/Saale, Germany

www.memunity.com

Other DfMM-related News

NEXUS Market Analysis for MEMS and Microsystems III, 2005-2009 available

Over the next five years, the Microsystems (including MST/MEMS) market is predicted to grow at a rate of 16% per year from \$12 billion in 2004 to \$25 billion in 2009 across a spectrum of 26 MEMS/MST products. Employing the historical definition given by NEXUS – the smallest unit containing MEMS that is commercially available – the market will grow from \$ 36 billion to \$ 52 billion in 2009. Driving these markets are read/write heads, micro-displays and inkjet heads. The report is available now, priced at 1100 Euro, from 4M2C/enablingMNT.

The price for the NEXUS Roadmap (published in 2003) has been reduced from 800 to 300 Euro. A bundle of both reports is available at 1300 Euro.

Order forms can be found at www.enablingmnt.com. More information is available from Patric Salomon, E-mail: patric.salomon@4m2c.com

Course "Automatic Compact Modelling for MEMS: Applications, Methods and Tools", 23 Apr 06, Como, Italy

The course, which is held in conjunction with the EuroSimE 2006 conference, is made for engineers that use high-dimensional finite-element models during device simulation. It an overview on how to produce compact models directly from the FEM models for system-level simulation based on modern mathematical approaches (model order reduction). The main emphasis of the course is on IDEAS rather than on MATHEMATICS.

During the course you will learn:

- . Some basics of control theory (a short review of the essential facts)
- . How to reduce a linear system of ordinary differential equations by the truncated balanced approximation, by moment-matching methods, and by methods based on low-rank Grammian approximations
- . How to deal with nonlinear systems of ordinary differential equations
- . How to preserve design variable during model reduction
- . How to use the SLICOT library in order to solve practical problems
- . How to use mor4ansys (IMTEK software) in order to produce compact device models directly from

ANSYS models

. What other software is available for model reduction

Contact: Evgenii B. Rudnyi, IMTEK, Germany, E-mail: rudnyi@imtek.uni-freiburg.de

Online Professional Training for the Electronics Industry at ISLI, UK, starting January 2006

Enrolment is now open for the following courses:

- Introduction to Hardware Design Automation
- Introduction to Embedded Software Engineering
- IP Block Authoring
- System Partitioning
- IP Block Authoring
- VLSI Design
- Embedded Software – SoC
- Embedded Software – Operating Systems
- Embedded Software – Applications
- Microcontrollers & Microprocessors
- Introduction to Verification
- Semiconductor Design for Testability

Further Information about courses and prices: <http://www.sli-institute.ac.uk/student/dl/about.htm>.

Contact: Gillian Nagle/Gillian Ventre, ISLI, UK, E-mail: distlearn@sli-institute.ac.uk

Workshop “Mechanical Reliability of Silicon MEMS - Recent progress and further requirements”, 27-28 Feb 06, Halle/Saale, Germany

In this symposium speakers from industry, research institutes, as well as from universities will address topics like silicon MEMS market, reliability requirements, strength testing and prediction, dynamic analysis, fatigue wear and accelerated testing, and lifetime analysis.

It will be held at the Fraunhofer-Institute for Mechanics of Materials (IWM), which develops solutions to increase the safety, availability, and lifespan of components and systems ranging from microelectronic devices to power plant components.

More information and registration: www.iwmh.fraunhofer.de

Contact: Claudia Kaestner, Fraunhofer IWMH, Halle/Saale, Germany, E-mail:

claudia.kaestner@iwmh.fraunhofer.de

Next issue: **6 February 2006** (deadline for contributions: **1 February 2006**)

Please feel free to send us any DfMM-related news that might be of interest for our readership.

This e-mail newsletter contains public information, only. Please feel free to distribute it to anyone who might be interested in the topics.

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