



MINATEC® Crossroads '10  
PROGRAM

June 21–24, 2010  
GRENOBLE - FRANCE

[www.minatec-crossroads.com](http://www.minatec-crossroads.com)



5<sup>ème</sup> IDEAs Day

Workshop on Innovative Memory Technologies

Nanostructures for Clinical Diagnosis and Therapy

12<sup>th</sup> Leti Annual Review

ObservatoryNano Symposium

Micro and Nanotechnologies for Healthcare

Higher Education in Nanotechnologies and Nanosciences

Continuing Education in Microtech & Nanotech

CEA-Leti/Caltech-KNII Alliance Workshop

ICs, PV, and Emerging Markets: The Challenges for European Manufacturing

European Nanoelectronics Design Technology Conference

MINATEC Upstream Research

Embedded Wafer Level Packaging Workshop

Forum MTI on: The Diffusion of Nanotechnologies

Trends in NanoApplications (TNA): Energy

■ Education ■ Research ■ Industry

# Good to know!

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# Editorial



Jean-Charles Guibert  
Director of MINATEC

The MINATEC innovation campus opened its doors in 2006, and hasn't stopped growing since. Today, MINATEC provides 4,000 researchers, educators, students, and professionals from the world of industry with a place where they can pool their talents and share resources to accelerate the innovation process. MINATEC brings together leading thinkers in a broad range of fields and gives them access to the world-class facilities they need to experiment with new forms of innovation and push back the boundaries of science. The campus produces an impressive body of scientific research with 1,600 articles published and 300 patents filed each year.

We are pleased to invite you to come and discover first-hand the many facets of innovation at the 2010 edition of MINATEC Crossroads. The MINATEC Crossroads'10 program is packed with conferences and workshops presenting the latest international research coming out of MINATEC labs. You will also have an opportunity to learn about MINATEC's groundbreaking work with non-scientific populations like designers, sociologists, performing artists, and the general public, as well as new partnerships with small and medium-sized businesses.

Last, but not least, you will learn about Grenoble's future innovation campus, GIANT. The project aims to make Grenoble a world leader in science and technology, from basic research to innovation management, and will include campuses dedicated to three research pillars: MINATEC for micro- and nanotechnologies, a new energy technologies campus, and a healthcare and biotech applications campus.

Welcome to MINATEC Crossroads'10.

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## → MINATEC AUDITORIUM

leti

8:00 **Retrait des badges**8:30 **Accueil : présentation de la journée**

Elisabeth Ballery - Rédactrice en chef de Présences, BE Press Lyon  
 Théodore Zeldin - Historien, Grand Témoin  
 Michel Ida - Directeur Minatec IDEAs Laboratory

**Présentation et inscriptions aux RDV en tête à tête** par T. Zeldin

9:00 **Quelle ville pour demain ?**

Luc Gwiazdzinski - Géographe, Enseignant chercheur, Université Joseph Fourier, laboratoire PACTE  
 Raphaële Goulet - Architecte, Territorial Studio  
 Mathilde Lapiere et Simon Mourembles - Etudiants ENSAG Ecole d'Architecture  
 Richard Collin - Professeur à GEM, Directeur de l'Institut de l'Entreprise 2.0  
 Patrick Blouet - ST Ericsson, Projet Autonomie et Habitat

11:00 **Intermède sensible** : Adrien Mondot, Artiste informaticien11:15 **En parallèle : Rendez-vous en tête à tête et Exposition**

RDV tête à tête animés par Théodore Zeldin - 50 participants maximum (salle B220)  
 Exposition et Films (Grand Salon)

12:30 **Déjeuner**14:00 **Innovation, Usages et Technologies - méthodologie**

Armand Hatchuel - Professeur, Ecole des Mines ParisTech, co-président du groupe Design Theory de la Design Society  
 Bruno Aidan - Directeur des recherches sur les applications, Alcatel Bell Labs  
 Roland Schaar - Directeur sciences et sociétés, Cité des Sciences et de l'Industrie UNIVERSCIENCE  
 Yves Mahé - GRILOG  
 Bruno Lefebvre - Designer indépendant  
 Raphaële Ankaoua, Loïc Le Guen, Axel Delbrayère - Etudiants ENSCI-les ateliers Paris - Grenoble

15:30 **Intermède sensible** : Adrien Mondot, Artiste informaticien16:00 **Pause café**16:30 **Exposition (Grand Salon)**17:15 **Lancement du PRIX A.R.T.S.**

(Art Recherche Technologie Science) et rappel Lauréat 2009  
 Eliane Sausse - Directrice de l'Atelier Art-Sciences

17:30 **Epilogue et Partage**

Elisabeth Ballery et Théodore Zeldin

Partenaires du MINATEC IDEAs Laboratory :

Partenaires du 5<sup>ème</sup> IDEAs Day :

Les amis du comité de programme :



# Workshop on Innovative Memory Technologies

Monday, June 27

→ ROOM 224

Leti

MINATEC

MST

IMEP

8:30 a.m. **Opening**

## **Session: Silicon memories**

8:35 a.m. **Embedded memories for automotive: review and challenges**  
Marco Olivo - STMicroelectronics

9:10 a.m. **Novel modules for low-power and low-voltage Si-based embedded memories** Gabriel Molas - CEA-Leti

9:30 a.m. **90 nm embedded EEPROM: technology, products, and perspectives**  
Jean-Michel Mirabel - STMicroelectronics

9:50 a.m. **A stacked SONOS technology with crystalline gate-all-around Si nanowires for full 3D integration**  
Thomas Ernst - CEA-Leti

10:10 a.m. **New concepts for 1T-DRAMs on SOI**  
Sorin Cristoloveanu - IMEP

10:30 a.m. **Coffee break**

## **Session: Resistive memories**

10:50 a.m. **Phase change memory: leading edge technology to address the challenge of the convergence scenario**  
Giuseppe Crisenza - Numonyx

11:25 a.m. **Fabrication of configurable hybrid Memristor-CMOS integrated circuits: physics, materials science, and challenges**  
Gilberto Ribeiro-Medeiros - HP Labs

12:00 p.m. **Phase change memories for embedded applications**  
Luca Perniola - CEA-Leti

12:30 p.m. **Lunch**

2:00 p.m. **Nature of nonvolatile memories: PRAM, ReRAM, and PoRAM**  
Jae-Gun Park - Hanyang University

2:35 p.m. **Nanoscale switching of resistive memory structures**  
Christophe Muller - IM2NP

2:55 p.m. **Comparative study of non-polar switching behaviors of OxRAMs**  
Vincent Jousseau - CEA-Leti

## **Session: Toward high capacity memories?**

3:15 p.m. **From magnetic storage to magnetic memories and beyond**  
Claude Chappert - IEF

3:50 p.m. **Coffee break**

4:15 p.m. **Probe storage: How does it work and what might be its applications?** David Wright - University of Exeter

4:50 p.m. **Learning with memristives devices** Olivier Bichler - CEA-List

5:10 p.m. **Study of polymer memories for crossbar architectures**  
Micaël Charbonneau - CEA-Leti

5:30 p.m. **Closing**

# Nanostructures for Clinical Diagnosis and Therapy

→ **SMALL HALL**

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Monday, June 21

8:00 a.m. **Registration**

9:00 a.m. **Welcome**

9:15 a.m. **Toxicology of nanoparticles for in vivo applications**  
Prof. Jürgen Borlak - Fraunhofer Institute, Hannover, Germany

10:00 a.m. **Targeted photodynamic therapy using nanoparticles**  
Prof. Heinrich Walt - University Hospital Zurich, Switzerland

10:30 a.m. **Coffee break**

11:00 a.m. **Nano-Xray, nanoparticles for radiotherapy**  
Dr. Laurent Levy - Nanobiotix, France

11:30 a.m. **Polysaccharides for in vivo applications**  
Dr. Rachel Auzely - CERMAV, France

12:00 p.m. **A tool box for immunotoxicity studies of nanoparticles**  
Dr. Patrice Marche - Inserm, Institut Albert Bonniot, France

12:30 p.m. **Lunch**

2:00 p.m. **Overview of nanoparticles for medical applications**  
Prof. Claus-Michael Lehr - Uni Saarland, Germany

2:45 p.m. **PLA, PLGA polymeric nanoparticles**  
Prof. Rogerio Gaspar - University of Lisbon, Portugal

3:15 p.m. **Nanodrug delivery in CNS**  
Prof. Michel Deleers - UCB Pharma, Belgium

4:00 p.m. **Coffee break**

4:30 p.m. **Nanoparticles for cancer imaging**  
Dr. Jean-Luc Coll - Inserm, Institut Albert Bonniot, France

5:00 p.m. **Per-operative fluorescence imaging**  
Dr. Philippe Rizo - Fluoptics, France

5:30 p.m. **Closing**

# 12<sup>th</sup> Leti Annual Review

Tuesday, June 22

→ **MINATEC AUDITORIUM**



**leti**

9:00 a.m. **Registration**

9:30 a.m. **Opening: Leti & microelectronics at the heart of applications**  
Laurent Malier - Director, CEA-Leti, France

10:00 a.m. **Session 1: Challenges of embedded systems design**  
Joseph Sifakis - Director, CRI/PILSI, France

10:30 a.m. **Coffee break & networking**

11:00 a.m. **Session 2: Electronic challenges for the energy management of electric vehicles**  
Luc Bourgeois - Expert-Leader-Control Technology, Renault, France

11:30 a.m. **Session 3: Nanotechnologies and health: the Clinattec initiative**  
Prof. Alim-Louis Benadid – Scientific Advisor, CEA, France

12:00 p.m. **Session 4: Green data centers and microelectronics**  
Michel Guillemet - Group R&D Director, Bull, France

12:30 p.m. **Lunch**

2:00 p.m. **Session 5: Micro and nanotechnology progress for energy monitoring**  
Sébastien Dauvé - Chief of Laboratory, CEA-Leti, France

2:20 p.m. **Session 6: Optical links, a green benefit?**  
Xavier Hugon - Chief of Division, CEA-Leti, France

2:40 p.m. **Session 7: III-V a natural complement to silicon?**  
Marc Rocchi - CTO, OMMIC, France

3:00 p.m. **Session 8: 3D or how to extend integration on silicon?**  
Mark Scannell - Program Manager, CEA-Leti, France

3:20 p.m. **Session 9: Solutions for massively parallel computing**  
Fabien Clermidy - Research Engineer, CEA-Leti, France

3:40 p.m. **Session 10: Biochip: back to the future**  
Xavier Gidrol - Chief of Laboratory, CEA/DSV, France

4:00 p.m. **Coffee break & networking**

4:30 p.m. **Session 11: Enhancing mobile device consumer experience through radiotechnology research**  
Jyri Hämäläinen - Senior Business Development Manager, Nokia, Finland

5:00 p.m. **Session 12: MEMS R&D landscape in Japan**  
Katashiro Masahiro - General Director for Business and International Affairs, MMC, Japan

5:20 p.m. **Session 13: New partitioning challenge for RF solutions**  
François Perruchot - Program Manager, CEA-Leti, France

5:40 p.m. **Session 14: Toward biological VLSI**  
Michael Roukes - Director, Caltech, USA

6:00 p.m. **Closing: Laurent Malier - Director, CEA-Leti, France**

# ObservatoryNano Symposium

→ ROOM 224



8:30 a.m. **Registration**

9:00 a.m. **Welcome and overview of project**

Mark Morrison - IoN

9:10 a.m. **Materials**

Andreas Leson - FhG-IZM

9:40 a.m. **Security**

Prof Ashok Vaseashta - Institute for Advanced Sciences Convergence

10:10 a.m. **Economic and market trends**

Fran Periales - B&W

10:30 a.m. **Coffee break**

11:00 a.m. **Materials & security**

Aerogels Leif Brand - VDI-TZ

Adhesives and sealants for the construction industry Michael Gleiche - VDI-TZ

Sport and outdoor textiles Andrea Porcari - AIRI

Protective Materials for Emergency Responders Eleanor O'Rourke - IoN

12:00 p.m. **Developments in EHS research, and implications for new technologies**

Bryony Ross - IOM

12:30 p.m. **Lunch**

2:00 p.m. **Agrifood**

Eugenía Nuñez - Nanobiomatters S.L

2:30 p.m. **Health, medicine & nanobio**

Alex Domman - CSEM

3:00 p.m. **Environment**

Miroslav Cernik - Technical University of Liberec and AQUATEST

3:30 p.m. **Medicine, food & environment**

New developments in drug delivery and regenerative medicine

Mark Morrison - IoN

State of the art in biodegradable and edible food packaging

Douglas K. R. Robinson - IoN

Nano-iron: The solution for environmental remediation? Nicole Müller - EMPA

4:15 p.m. **Coffee break**

4:45 p.m. **New developments in regulations and standards**

Elvio Mantovani - AIRI

5:00 p.m. **Ethics in nanobiomedicine**

Ineke Malsch - MTV

5:15 p.m. **A toolkit for ethical reflection and communication in nanotechnology**

Marc Pavlopoulos - CEA

5:45 p.m. **Closing**

Tuesday, June 22

→ Program continues on Wednesday: p. 10

# ObservatoryNano Symposium

→ ROOM 224



8:30 a.m. **Registration**

9:00 a.m. **ICT**  
Antonio Correia - PHANTOMS

9:30 a.m. **Energy & transport**  
Dominique Guyomard - CNRS/IMN

10:00 a.m. **ICT, energy & transport**  
Nanophotonics and graphene based electronics Tom Crawley - Spinverse  
Electric vehicles Fran Periales - B&W  
Photovoltaics Sébastien Berger - CEA

10:45 a.m. **Coffee break**

11:15 a.m. **Corporate social responsibility and the nanometer tool**  
Brigitte Biermann - Triple Innova

11:35 a.m. **Plans for third year**

11:45 a.m. **Discussion, Q&A**

12:30 p.m. **Closing**

Wednesday, June 23

# Micro and Nanotechnologies for Healthcare

→ **MINATEC AUDITORIUM**



8:00 a.m. **Registration**

8:30 a.m. **Application of microtechnologies to implantable systems and surgical tools**

Agnès Bonvilain - Associate Professor, TIMA Laboratory (CNRS - Grenoble INP - UJF), France

8:55 a.m. **New perspectives from micro and nanotechnologies in medical diagnostics**

Jean Chabbal - Head of the Technologies for Healthcare Division, CEA-Leti/DTBS, France

9:20 a.m. **Augmented medical interventions**

Philippe Cinquin - Member of the Computer Assisted Medical Interventions group and head of the CIC-IT, TIMC - IMAG Laboratory, France

9:45 a.m. **Current trends on biochips**

Yann Chevolut - CNRS researcher, Responsible for the biotechnology aspect of Nanolyon technological platform, Lyon Institute of Nanotechnology, France

10:10 a.m. **Motion IC systems for healthcare and wellness applications**

Bruno Flament - Chief Technology Officer, Movea, France

10:35 a.m. **Micropatterning cytophobic surfaces for cell normalization: applications in drug discovery and toxicology**

Alexandra Fuchs - Founder and co-chief executive officer, Cytoo, France

11:00 a.m. **Disease management and added value integrated drug delivery systems**

Philippe Laurent - Vice President Medical Affairs, Becton Dickinson, France

11:25 a.m. **Fluorescence molecular imaging in surgery**

Philippe Rizo - Chief Scientific Officer, Fluoptics, France

11:50 a.m. **Active lead for congestive heart failure resynchronization therapy**

Renzo Dal Molin - Advanced Research Director, SORIN CRM

12:15 p.m. **Questions**

12:30 p.m. **Lunch**

Wednesday, June 23

# Higher Education in Nanotechnologies and Nanosciences

→ ROOM 220



8:45 a.m. **Registration**

9:00 a.m. **Introduction:**

Thierry Ouisse - Full Professor (Physics, Nanophysics), Physics, Applied Physics, Electronics & Materials Sciences Department, Grenoble Institute of Technology, France

**Courses in nanosciences in the United States, Korea and France**

**Karl K. Berggren**

Emanuel E. Landsman Associate Professor of Electrical Engineering, Department of Electrical Engineering & Computer Science, Massachusetts Institute of Technology, United States

**Gyu Tae Kim**

Professor - School of Engineering, Korea University, South Korea

**Raphaël Clerc**

Associate Professor (Microelectronics, Optoelectronics), Physics, Applied Physics, Electronics & Materials Sciences Department, Grenoble Institute of Technology, France

10:30 a.m. **Coffee break**

11:00 a.m. **Debate with the audience**

12:30 p.m. **Lunch**

Wednesday, June 23

# Continuing Education in Microtech & Nanotech

→ ROOM 220



1:30 p.m. **Registration**

2:00 p.m. Chair: Ivan Ring Nielsen, Co-ordinator EuroTraining  
**Training requirements of the MST industry**  
Results of the EuroTraining survey  
Hervé Fanet - CEA-Leti, France

2:20 p.m. **Training needs and in-service training in an industrial company**  
Case study: TRONICS  
Stéphane Renard - TRONICS, France

2:40 p.m. **Training needs and in-service training in an industrial company**  
Case study: STMicroelectronics  
Pascal Ancey - STMicroelectronics, France

3:00 p.m. **The EuroTraining course platform**  
On-line services for engineers, researchers, training providers, and lecturers  
Helma Elens - COREP, Italy

3:20 p.m. **In-service training in microtech and nanotech**  
FSRM course program  
Annette Locher - FSRM, Switzerland

3:45 p.m. **End of workshop**

Wednesday, June 23

# CEA-Leti/Caltech-KNI Alliance Workshop

→ PHELMA AUDITORIUM



8:45 a.m. **Registration**

9:00 a.m. **Welcome remarks and vision statement for NANOVLSI Alliance**  
Michael Roukes - Caltech & Philippe Andreucci - CEA-Leti

9:20 a.m. **Caltech-Leti nanosystems partnership: member benefits & solutions including members' perspectives**  
Ariel Cao - Alliance for Nanosystems VLSI & Philippe Andreucci - CEA-Leti

9:50 a.m. **Roadmap toward high-sensitivity & selectivity, gas-phase chemical sensing**  
Pre-analytical (pre-concentrator,  $\mu$ GC &  $\mu$ GC x GC) and analytical module  
Ed Myers - Caltech & Philippe Andreucci - CEA-Leti

10:30 a.m. **Coffee break**

11:00 a.m. **Roadmap toward high-throughput proteomic  $\mu$ -mass spectrometry**  
Michael Roukes - Caltech

11:30 a.m. **Roadmap toward microfluidic biosensing for medical, pharmaceutical, environmental, and agrofood diagnostic**  
Picomolar molecule detection, force detection & biocalorimetry  
Jessica Arlett & Michael Roukes - Caltech

12:10 p.m. **Closing, general Q&A**

12:30 p.m. **Lunch**

2:00 p.m. **Review of latest updated results**  
**Nanosystems Partnership members only**  
Technical results, IP, strategy, and roadmap - Will be held at CEA-Leti

5:00 p.m. **Closing**

Wednesday, June 23

# ICs, PV, and Emerging Markets: The Challenges for European Manufacturing

→ ROOM 224



1:30 p.m.

**Registration**

2:00 p.m.

**Workshop**

SEMI is the global industry association serving the manufacturing supply chains for the microelectronic, display, and photovoltaic industries. Since 1970, SEMI has been committed to helping members grow more profitably, create new markets and meet common industry challenges. SEMI Europe (244 members in over 21 countries) decided in 2009 to open a new permanent office in Grenoble on the premises of the MINATEC Innovation Campus, a hub for micro-nanotechnologies in Europe.

During the MINATEC Crossroads'10 week of events, SEMI Europe will jointly organize with Silicon Saxony a workshop bringing together key players from the microelectronics business: public authorities, manufacturers, researchers and educational program leaders.

The workshop will target IC, PV and emerging markets as challenges for European manufacturing, with three consecutive panel sessions to provide insights from device makers, equipment & materials suppliers and service providers (including R&D laboratories).

Wednesday, June 23

# European Nanoelectronics Design Technology Conference

## → SMALL HALL

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Mentor Graphics

SYNOPSYS

8:45 a.m. **Registration**

9:00 a.m. **Welcome**

9:15 a.m. **Opening:** Laurent Malier - Director of CEA-Leti, France

9:30 a.m. **Design in a fast moving wireless industry - The challenges of managing complexity and time to market**  
Jorgen Lantto - CTO, ST Ericsson, Sweden

10:00 a.m. **Technological and economical challenges of the SoC companies for the upcoming CMOS generations**  
Jean-Marc Chery - CTO, STMicroelectronics, France

10:30 a.m. **Coffee break**

### Technical session 1: HW and SW for multiprocessors and many cores

11:00 a.m. **Tutorial: TSAR cache-coherent architecture**  
Prof. Alain Greiner - UPMC, France

11:45 a.m. **Specification and validation of CC protocol**  
Huy-Nam Nguyen - Bull, France

12:05 p.m. **SoftSOC HDS architecture**  
Marcos Martinez - ES2, Spain

12:30 p.m. **Lunch**

### Technical session 2: Smart lighting

2:00 p.m. **Tutorial: Lighting systems based on solid-state lighting devices**  
Theo Treuniet - Philips, The Netherlands

2:45 p.m. **Implementation of LED lighting in a residential show room**  
Jean-Louis Lovato - Schneider Electric, France

3:05 p.m. **Lighting roadmap** Patrick Mottier - CEA-Leti, France

4:00 p.m. **Coffee break**

4:30 p.m. **ID security and biometrics**

Drivers and demand for sophisticated design methods and tools for electronic components embedded software and related systems  
Christian Sebeke - Bosch, Claude Barral - Gemalto, Bernard Candaele - Thales, Claudia Eckert - Fraunhofer SIT, Detlef Houdeau - Infineon, Laurent Sourgen - ST

### Technical session 3: European EDA SMEs - key for innovation

6:00 p.m. **Introduction and overview presentation**  
Brieuc Turluche - CEO CWS Coupling Wave Solutions  
Andreas Ripp - CMO & Managing Director, MunEDA

6:15 p.m. **Infiniscale** Firas Mohamed - President & CEO

6:30 p.m. **Edxact S.A.** Mathias Silvant - CEO

6:45 p.m. **Magillem design services**  
Emmanuel Vaumorin - Strategic Project Manager & Administrator

7:00 p.m. **Panel session: challenges for European EDA SMEs in global markets**  
Andreas Ripp - MunEDA, Peter Feist - CEO Onespin Solution, Gislain Kaiser - CEO DoceaPower, Michel Tabusse - CEO Satin-IP, Eric Beisser - CEO Xyalis  
Brieuc Turluche - CEO CWS Coupling Wave Solutions

→ Program continues on Thursday: p. 19

# MINATEC Upstream Research

→ PHELMA AUDITORIUM



1:30 p.m. **Registration**

## **Advances in single dopant and single electron effects in silicon nanodevices**

2:00 p.m. **Introduction:** Dr. Marc Sanquer - Researcher, CEA/INAC, France

2:05 p.m. **Single dopant transport spectroscopy in silicon**  
Pr. Sven Rogge - TU Delft, the Netherlands

2:45 p.m. **Single magnetic dopant in quantum dots**  
Dr. Lucien Besombes - Researcher, CNRS-Institut Néel, France

3:25 p.m. **Single dopant modelization in nanowires**  
Dr. Yann-Michel Niquet - Researcher, CEA/INAC, France

4:05 p.m. **Coffee break**

4:25 p.m. **MOS-SETs**  
Dr. Xavier Jehl - Researcher, CEA/INAC, France

5:05 p.m. **Semiconductor structures for quantum information**  
Dr. David Williams - Researcher, Hitachi Cambridge Lab, United Kingdom

→ Program continues on Thursday: p. 18

Wednesday, June 23

# MINATEC Upstream Research

## → MINATEC AUDITORIUM



8:00 a.m. **Registration**

8:40 a.m. **Welcome:** Paul Jacquet - General Administrator, Grenoble Institute of Technology, France

### **Nanoelectronics 1: New materials and nanostructures**

9:00 a.m. **Engineering nanostructures for nanoelectronic logic switches and Memories** H. S. Philip Wong - Stanford University, United States

9:30 a.m. **Growth and self assembly of nanostructures** Thierry Baron - CNRS, France

9:50 a.m. **The transmission electron microscope: a tool for quantification and mapping of physical properties of nano-objects** Pascale Bayle-Guillemaud - CEA, France

10:10 a.m. **Epitaxial graphene, a new material for electronics** Claire Berger - CNRS, France

10:30 a.m. **Coffee break**

### **Nanoelectronics 2: From ultimate CMOS to beyond CMOS devices**

11:00 a.m. **European research roadmap for nanoelectronics** Francis Balestra - CNRS, France

11:30 a.m. **Development and perspectives of nanoimprint lithographies** Cécile Gourgon - CNRS, France

11:50 a.m. **Plasma etching processes for nanoCMOS and nanoelectronic devices** Erwine Pargon - CNRS, France

12:10 p.m. **Quantum transport simulation in nanostructures** Marco Pala - CNRS, France

12:30 p.m. **Lunch**

### **Spintronics**

2:00 p.m. **Recent breakthroughs in advanced spintronics** Claude Chappert - CNRS, France

2:30 p.m. **Non-collinear spin transport in layered structures and bulk materials for spintronics** Mairbeck Chshiev - Fondation Nanosciences, France

2:50 p.m. **From molecular electronics towards molecular spintronics** Vincent Bouchiat - CNRS, France

3:10 p.m. **MRAM, from the lab to the fab...to the lab** Jean-Pierre Nozières - Crocus Technology, France

3:30 p.m. **Coffee break**

### **Nanotechnologies for biological objects**

4:00 p.m. **Probing nanoscale variations of extracellular ligands during cell adhesion and migration** Ada Cavalcanti-Adam - Univ-Heidelberg, Germany

4:30 p.m. **Layer-by-layer films with controlled mechanical and biochemical properties: perspectives in drug delivery and tissue engineering** Catherine Picart - Grenoble Institute of Technology, France

4:50 p.m. **Nanobiodroplet chip for controlled assembly of lipid bilayers and detection of single-protein activity** Benjamin Cross - UJF, France

5:10 p.m. **Structured biomolecular assemblies for the development of biological sensors** Serge Cosnier - CNRS, France

5:30 p.m. **Coupling chemistry and optics for non-adherent cell recognition** Thierry Livache - CEA, France

# European Nanoelectronics Design Technology Conference

## → SMALL HALL

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Leti

ARMADA

Mentor Graphics

SYNOPSIS

9:00 a.m. **Registration**

9:30 a.m. **IP & Re-Use – the next wave of a successful model!**  
Christoph Heer - VP for Digital IP and Reuse, Infineon, Germany

10:00 a.m. **Linking design and fabrication technologies**  
Michel Brillouet - Fellow, CEA-Leti, France

10:30 a.m. **Coffee break**

### Technical session 4: 3D integration

11:00 a.m. **Tutorial: Present and future of 3D-integration**  
Jean-Marc Yannou - YOLE, France

11:40 a.m. **Development of CAD tools for 3D-integration**  
Heiko Dudek - Cadence

12:05 p.m. **Perspectives of heterogenous systems using 3D-integration technology**  
Peter Ramm - Fraunhofer IZM Munich, Germany

12:30 p.m. **Lunch**

### Technical session 5: Low power design

2:00 p.m. **Tutorial: Power efficient designs from PA and RF to baseband, from system level to IC implementation**  
Bernard Candaele - Thales

2:45 p.m. **Top down methodology for SoC power management based on a programmable controller**  
Patrick Valdenaire - ST Ericsson

3:05 p.m. **Spidergon STNoC overview, and low power specific features**  
Michael Soulie - STMicroelectronics, France

4:00 p.m. **Coffee break**

### Technical session 6: Advanced test technologies

4:30 p.m. **Tutorial: Test and dependability of microsystems**  
Serge Bernard - LIRMM and Philippe Cauvet, Ophthimalia, France

5:15 p.m. **Evaluation of parametric test metrics for mixed-signal/RF DFT solutions using statistical techniques**  
Salvador Mir - TIMA

5:35 p.m. **Computer-aided-test techniques for the evaluation of AMS DFT**  
Hervé Naudet - STMicroelectronics, France

6:00 p.m. **Closing**

Thursday, June 24

# Embedded Wafer Level Packaging Workshop

→ ROOM 224

leti

AMAPS

8:00 a.m. **Registration**

8:15 a.m. **Welcome and opening**

Session Co-chairs: G. Poupon - CEA-Leti and T. Meyer - Infineon

8:30 a.m. **Fan-out WLCSP and chip embedding: two different technologies with similar benefits**

J. M. Yannou - Yole Développement

## Session 1: Fan out

9:00 a.m. **Embedded wafer level packaging**

X. Baraton, Y. Jin, M. Garnier, E. Saugier, R. Coffy - STMicroelectronics

9:30 a.m. **Embedded wafer level ball grid array (eWLB)**

T. Meyer, G. Ofner, K. Pressel, B. Römer - Infineon Technologies AG

10:00 a.m. **Wafer level embedded system in package (WL-eSiP) for 3D packaging solutions**

I. S. Kang - Semiconductor R&D Division, NEPES Corporation

10:30 a.m. **Coffee break**

11:00 a.m. **CIWIS and Viabelt: 2D and 3D technologies which allow integration of multi-source know good dies at the wafer level**

J. C. Souriau, N. Sillon, G. Poupon - CEA-Leti MINATEC

11:30 a.m. **High performance and high reliability WLP silicon passives for miniature medical devices**

F. Murray, C. Brunel - IPDIA

12:30 p.m. **Lunch**

## Session 2: Chip embedding

2:00 p.m. **Introduction**

Session Co-chairs: J. M. Yannou - Yole développement and M. Scanell - CEA-Leti

2:15 p.m. **The next generation of system-in-package technology by chip embedding**

A. Ostmann, L. Boettcher, D. Manassis, S. Karaszkievicz - IZM and TUB

2:45 p.m. **Stacking of known good rebuilt wafers without TSV applications in industrial domains**

P. Couderc, N. Boulay, Dr. C. Val - 3DPlus

3:15 p.m. **Ultra-thin-chip embedding technologies (UTCS and UTCP)**

E. Beyne - IMEC

4:00 p.m. **Coffee break**

4:15 p.m. **Embedded packages, an emerging new package platform**

C. Beelen-Hendrikx - NXP

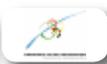
4:45 p.m. **Embedding as a packaging solution**

N. Haslebner, M. Moranz, J. Stahr, C. Schwald - ATS

5:15 p.m. **Closing**

# Forum MTI on: The Diffusion of Nanotechnologies

→ ROOM 220



8:00 a.m. **Registration**

8:30 a.m. **Let's talk about management, nanotechnologies & innovation**

8:45 a.m. **Nanomarkets: building expectations about nascent markets**

*Sponsored by NanoBench Project*

*The role of large firms in building new markets*

Vincent Mangematin - Grenoble Ecole de Management, France

*Latest nanobench news: from patents to firms' activities*

Vincent Mangematin - Grenoble Ecole de Management, France

*Customer resistance to nanotechnologies*

Caroline Gauthier - Grenoble Ecole de Management, France

10:15 a.m. **Coffee break**

10:30 a.m. **Nano-commercialization: opportunities, market creation, and barriers**

*Sponsored by Nanocom Project*

*Nanocom on the barriers to the commercialization of nanotechnologies*

Patrick Vuillermoz - Plastipolis

11:15 a.m. **Nano-collaboration: clusters to accelerate the diffusion of nanotechnologies**

*Sponsored by FRIDA Project*

*The diffusion of nanotech by STMicroelectronics: a comparison between Catania and Grenoble*

Daniela Baglieri - University of Messina, Italy

*Regulatory aspects of nanotechnologies*

Claire Auplat - Imperial College London, United Kingdom

12:45 p.m. **Lunch and on-going discussions with project leaders**

2:00 p.m. **Nano-based start-up forum**

*Sponsored by Nanoexpectation Project and Grenoble Alpes Incubation*

*The incubator's perspective: a map of nano-related start-ups and preliminary learning from successes and failures*

Alain Bragagnolo - Grenoble Alpes Incubation, France

*Stories by founders of nanobased start-ups:*

Docea Power by Ghislain Kaiser, Isorg by Laurent Jamet, and discussion with practitioners of nanotechnologies

*Invitation to participate: Strategic Committee on Nanoexpectations (EANR Pnano Project)*

Sylvie Blanco - Grenoble Ecole de Management, France

4:00 p.m. **Coffee break**

4:30 p.m. **Open discussion: "Nanos: more support, less visibility"**

Vincent Mangematin - Grenoble Ecole de Management

6:00 p.m. **Closing**

Thursday, June 24

# Trends in NanoApplications (TNA): Energy

→ PHELMA AUDITORIUM



8:30 a.m. **Registration**

## Session 1: Nanoscale devices for energy

9:00 a.m. **New technologies for energy generation and power conversion**

Salvo Coffa - STMicroelectronics

**Zero-power ICTs**

Ralph Stübner - European Commission, ICT Future and Emerging Technologies

**Nanoscale thermal management for energy efficiency optimization**

Bruno Michel - IBM Zurich

**Breakthrough technologies for new devices**

Efienne Quesnel - CEA-Liten

**Nanotechnologies for ultra energy-efficient electronics**

Hervé Fanet - CEA-Leti

10:30 a.m. **Coffee break**

## Session 2: Energy production and storage

11:00 a.m. **Nanomaterials and lithium-ion batteries**

Dominique Guyomard - CNRS/IMN

**Nanostructured magnesium hydride for reversible hydrogen storage**

Patricia De Rango - Institut Neel, CNRS

**Electrocatalysis using nanoparticle materials**

Claude Lamy - University of Poitiers, CNRS "LACCO"

**Nanostructure of polymer electrolyte membranes for fuel cells**

Gérard Gebel - CEA/INAC

**State of the art and perspectives in Li batteries, contribution of nanotechnologies**

Sébastien Patoux - CEA-Liten

12:30 p.m. **Lunch**

## Session 3: Nanomaterials for energy harvesting and saving

2:00 p.m. **The advent of mesoscopic solar cells**

Michael Graetzel - EPFL

**Tailoring nanoscale thermal transport by geometric design**

Natalio Mingo - CEA-Liten

**Organic photovoltaics: state of the art and research at IPMS**

Olaf R. Hild - FhG IPMS

**Photonic control to enhance the efficiency of organic photovoltaic cells**

Jordi Martorell - ICFO - Institut de Ciències Fotòniques

**Nanotechnologies to improve energy efficiency**

Serge Nicolas - Arkema

**Engineered nanomaterials for intensified energy transportation**

Dongsheng Wen - Queen Mary University of London

4:00 p.m. **Closing**

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# Free conferences

## MINATEC Plenary Session: Science & Society Initiatives in France

Tuesday, June 22 – MINATEC Auditorium – 6:30 p.m.



### Claudie Haigneré

Currently head of Paris Science museums *Le Palais de la Découverte* and *La Cité des Sciences*; former French Minister of Science and Research.

MINATEC's Plenary session will offer you valuable insights into several initiatives taking place in France focusing on the interaction between Science and Society.

## GIANT Innovation Campus Roundtable: Integration of the Knowledge Triangle Challenges and Key Success Factors

Wednesday, June 23 – MINATEC Auditorium – 5:30 p.m.



The GIANT Innovation Campus partners (UJF, G-INP, GEM, CEA, CNRS, ILL, EMBL, ESRF) are working together to transform Grenoble's Polygone scientifique district into one of the world's leading centers for higher education and advanced research. This round table will address the integration the knowledge triangle's three fundamental components: higher education, research, and innovation.

Panelists: **Professor Sukekatsu Ushioda** (President of NIMS in Japan); **Professor James Castracane** (Head of the Nanobioscience Constellation, College of Nanoscale Science and Engineering, State University of New York at Albany, United States); **Professor Horst Hippler** (President of the Karlsruhe Institute of Technology, Germany); and **representatives of GIANT**.

The debate will begin with brief presentations by each panelist.

Next, a broader discussion will address the following questions

- What are the main challenges for research, education and innovation in the knowledge society?
- What are the key success factors in integrating industry, research and higher education?

## International Relations for Responsible Nanotechnology-based Innovations

Thursday, June 24 – MINATEC Auditorium 6:30 p.m.



### Françoise Roure

Senior National Adviser, High Council for Industry, Energy and Technologies  
French Ministry of the Economy, Industry and Employment.

Beyond the perceived risks of nanotechnologies, real stories are now highlighting the urgent need to build an international regulatory framework for the development and commercialization of such potential breakthrough innovations. Beyond economic governance, human, ethical, social and local development issues must also be addressed. Françoise Roure will argue in favor of a global governance framework for nanotechnology-induced changes, with appropriate tools and methodologies, in order to develop and sustain responsible innovation. The conference will encourage interactive discussion with the audience.

# Networking events

## Opening cocktail

Monday, June 21 at 6:30 p.m.

Great Hall

## Gala dinner at Pignol Sainte-Cécile restaurant

Tuesday, June 22 at 8:00 p.m.

Departure from MINATEC by tram at 7:45 p.m.

Founded in 1954, Pignol is one of Lyon's most prestigious culinary institutions. The legendary caterer has recently opened a new restaurant in the heart of Grenoble's old town. Located in the vibrant Antiques district, Pignol has taken up residence in a dramatic architectural setting: Saint Cécile's Convent.

Pignol Sainte-Cécile offers a wonderful tea room in the convent's former cloister—the perfect place to enjoy award-winning pastry chef Jean-Paul Pignol's creations. The brasserie-style restaurant, in the nuns' courtyard, is strikingly decorated in graphic gray and bright red—a reflection of both the building's religious past and its culinary present.

Outside, the walled garden is planted with fruit trees—pear, cherry, and fig—and grapevines, just like when the Bernardin nuns lived there. Today, it serves as a terrace, providing outdoor diners with a peaceful haven right in the city center.



## Reception at the CCSTI

Wednesday, June 23 at 8:00 p.m.

Departure from MINATEC by bus at 7:30 p.m.

Grenoble-based science education center CCSTI (*Centre de Culture Scientifique Technique et Industrielle*) will give you an opportunity to learn about programs to promote industrial and technical scientific education to a broad variety of audiences. Participants will then have time to visit the temporary exhibit, and the evening will end with a cocktail reception.

*"Think globally, act locally."*

Founded in 1979 CCSTI, known locally as "La Casemate," is France's oldest science education center, focusing on helping people of all ages embrace the sciences and technologies of today and tomorrow.

*About the temporary exhibition: Avez la pilule ! [Swallow the pill]*

CCSTI is currently running a temporary exhibit on society's perception of performance. Whether it is school, at work, in our personal relationships, or in amateur sports, society pushes us to constantly do more, better. Before we know it, we are locked into a vicious cycle that soon takes root in our culture and society. In this exhibit, artists and researchers in the fields of ITCs and neuroscience come together to show the ways in which man, in his constant quest to push back the limits, sometimes alienates himself from his own values. This creates a disconnect that can result in drug use and abuse, sometimes under medical supervision.



## Closing cocktail

Thursday, June 24 at 7:30 p.m.

Great Hall

Enjoy one last get together after the free conference.

# Exhibition

## → 1st FLOOR

### EZ3KIEL-ARTS SCIENCES

→ LES CORDES SENSIBLES



→ LA MADONE



→ LE TELESCOPE



→ LES FLACONS



→ LE PIANO



→ LE VÉLO

## → GROUND FLOOR

### ENSCI-LES ATELIERs

→ "HUMAN SCALE PROJECT"



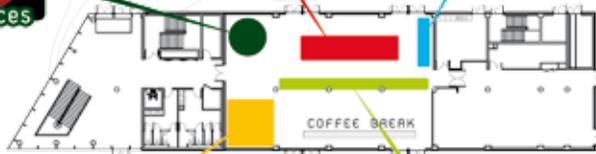
### ENSAG-CCSTZ

→ BLG SCALE, SMALL OBJECTS



### EZ3KIEL-ARTS SCIENCES

→ LA CAGE FA RE DO



EXEO

→ ARTIST-IN-RESIDENCE



LITUS

→ LUPIN

## Artist-in-Residence: EXEO

• Exeo—an INAC initiative supported by CEA-Leti/DTBS, Liten/INES, and Arc-Nucléart—began on November 16, 2009. Exeo is an artist-in residence program at the CEA's labs. Visual artist Valérie Legembre, who invented the *Peau-de-photo*<sup>®</sup> photographic process, has immersed herself in the laboratory environment, working side-by-side with researchers and technicians. Her mission is to gather raw material—the words and images of scientific research—to create an exhibit to be displayed in places of art and science starting in December 2010.

[www.resi-exeo.fr](http://www.resi-exeo.fr)

## Innovation in Use

Immerse yourself in the city of the future at the 5<sup>th</sup> IDEAs Day exhibit.

• Discover an innovative new public lighting system invented by students at ENSCI (*l'Ecole Nationale Supérieure de Création Industrielle*). Their ingenious design uses the latest technologies and minimizes environmental impacts.

• Or, try your hand at "Lupin," an intelligent public lighting system designed for bicycle paths. This CEA-Leti development switches the individual fixtures on and off in a "wave" pattern to save energy, integrates urban traffic signals for enhanced safety (particularly at intersections), and provides automatic dynamic metering (most utilities currently use manual metering and magnetic loops). The design emerged in response to the Veloce bicycle-use study and concerns expressed by local government in Grenoble. The project is designed to illustrate the concept and show how it works via a demo system of ten communicating light fixtures with 96 "warm" LED lamps each, autonomous solar-powered light sensors, and a ZigBee communication network to tie it all together.

• Enter the imaginary world dreamed up by architecture students at ENSAG (*l'Ecole Nationale Supérieure d'Architecture de Grenoble*) during the "Big Scale, Small Objects" workshop and discover all of the things communication networks could do in tomorrow's cities.

• Continue your visit with EZ3kiel's *Mécaniques poétiques* [Mechanical Poems], a unique encounter between innovation and the arts. At the crossroads of several disciplines, the forceful installations draw upon the artistic meanderings of an independent music group and the technological research of CEA-Grenoble labs. The resulting blend defies categorization and opens new doors to the group's artistic universe. This unique exhibit will feature installations produced during EZ3kiel's residency at the Atelier Arts-Sciences, an unusual fusion of theater and scientific research formed by the Hexagone National Theater and the CEA-Leti international research center.

Participants in the residency: EZ3kiel: Designer and artist Yann Nguema; CEA-Grenoble: Roland Blanpain, head of microsystems and communicating objects department; Angelo Guiga, technician and head of project; Dominique David, researcher; Laure Pérès, engineering intern; Sylvain Baquet, research engineer; Antoine Robinet, research engineer; Thierry Thomas, research engineer; Jean-Yves Castellán, in charge of scale models; Laurent Jouanet and Jean Rémi Savel, technicians; Michel Blanc, engineer; Yves-Armel Martin, director; Christophe Monnet, in charge of production, ERASME

[www.atelier-arts-sciences.eu](http://www.atelier-arts-sciences.eu)

# MINATEC Crossroads'10 Program

|                           | MORNING SESSIONS   | LUNCH | AFTERNOON SESSIONS   | LATE AFTERNOON   | EVENING                         |
|---------------------------|--|-------|--|--|---------------------------------|
| <b>Monday, June 21</b>    | 5 <sup>ème</sup> IDEAs Day<br>Workshop on Innovative Memory Technologies<br>Nanostructures for Clinical Diagnosis and Therapy  | LUNCH | 5 <sup>ème</sup> IDEAs Day<br>Workshop on Innovative Memory Technologies<br>Nanostructures for Clinical Diagnosis and Therapy  | Exhibition   | Opening cocktail                |
| <b>Tuesday, June 22</b>   | 12 <sup>th</sup> Leti Annual Review<br>ObservatoryNano Symposium   | LUNCH | 12 <sup>th</sup> Leti Annual Review<br>ObservatoryNano Symposium   | MINATEC Plenary Session  | Gala dinner                     |
| <b>Wednesday, June 23</b> | ObservatoryNano Symposium<br>Higher Education in Nanotechnologies & Nanosciences<br>Micro & Nanotechnologies for Healthcare<br>CEA-Leti/Caltech-KNI Alliance Workshop<br>European Nanoelectronics Design Technology Conference | LUNCH | Continuing Education in Microtech & Nanotech<br>MINATEC Upstream Research<br>ICs, PV, and Emerging Markets: The Challenges for European Manufacturing<br>European Nanoelectronics Design Technology Conference         | GIANT Innovation Campus Roundtable                                       | Official reception at the CCSTI |
| <b>Thursday, June 24</b>  | European Nanoelectronics Design Technology Conference<br>MINATEC Upstream Research<br>Embedded Wafer Level Packaging Workshop<br>Forum MTL on: The Diffusion of Nanotechnologies<br>Trends In NanoApplications: Energy         | LUNCH | European Nanoelectronics Design Technology Conference<br>MINATEC Upstream Research<br>Embedded Wafer Level Packaging Workshop<br>Forum MTL on: The Diffusion of Nanotechnologies<br>Trends In NanoApplications: Energy | International Relations for Responsible Nanotechnology-based Innovations | Closing cocktail                |

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