

Maxime VINCENT

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Objective To conduct research in the field of MEMS/NEMS with an emphasis on integration of nano-objects into functional and reliable devices.

Skills Strong expertise in electrical measurements, SEM, EDX, AFM and conductive AFM characterization techniques.
Strong knowledge in electrical breakdown, field emission, electrical conduction and tribology.
Process experience includes DUV and electron beam lithography, nanotubes growth and thin film deposition. Cleanroom and microfabrication experience.
Experience with Labview, Matlab, ANSYS and Cadence.

Experience **Schneider Electric & CEA-Leti**, Grenoble, France March 2007, 3 years
Research Engineer, PhD thesis - Reliability of electrical contacts in a MEMS switch.
Reliability study on a pre-industrial MEMS switch / Full development of an endurance test setup mimicking a MEMS switch, dedicated to evaluate alternative contact materials / Modification of an AFM to study field emission and electrical breakdown in nanometer-scale gaps.
Industrial project, work performed in close collaboration with Schneider Electric and CEA-Léti / Two international conferences (Orlando and Vancouver).
Contact: Jérôme Delamare / jerome.delamare@g2elab.grenoble-inp.fr

STMicroelectronics, Crolles, France March 2006, 6 months
Master's thesis - Feasibility study of hybrid lithography in 45nm CMOS technology.
Evaluation of DUV photoresists under electron beam exposure / Development of a hybrid lithography process combining 193nm DUV optical lithography and e-beam lithography / Work in a state of the art 300mm cleanroom (Crolles2 Alliance).

Swiss Federal Institute of Technology, Neuchâtel, Switzerland April 2005, 6 months
Sensors, Actuators and Microsystems Laboratory (Prof. Nico de Rooij)
Master's thesis - Growth and integration of carbon nanotubes on MEMS heaters.
Development of a CVD process to grow carbon nanotubes / Setup and process improvements to allow nanotubes growth using MEMS heaters / SEM, TEM and electrical characterizations / Microfabrication and cleanroom concept.
Contact: Danick Briand / danick.briand@epfl.ch

National Research Council, Ottawa, Canada April 2004, 4 months
Research intern - Synthesis and characterization of colloidal quantum dots. Study of a quantum dot-quantum well CdSe-CdTe system.
Contact: Kui Yu / kui.yu@nrc.ca

Education **Ph.D., Electrical Engineering, (May 2010)**
Grenoble Institute of Technology (INPG) & University of Grenoble.
M.S., Micro & Nano Electronics, 2006
Grenoble Institute of Technology (INPG) & University of Grenoble.
M.S., Materials Science and Engineering, 2005
Polytechnic School of Engineering, University of Grenoble (Polytech'Grenoble).

Additional information Languages **English, fluent.** TOEIC (2005): 885/990.
German, basic knowledge.
Sports Every mountain sport, especially skiing (intensive practice).
Hobbies Travelling, Reading, Photography.

Publications Journal Papers

- M. Vincent, S. Rowe, C. Poulain, L. Chiesi, J. Delamare and F. Houzé, "*Field emission and material transfer in MEMS switches electrical contacts*", in preparation for Appl. Phys. Lett.
- M. Vincent, D. Briand, G. Schürmann, N.F. de Rooij, "*Direct integration of carbon nanotubes on micromachined hotplates*", J. of Nanoengineering and Nanosystems, Proc. IMechE, vol. 221(3) Part N, **2007**, pp. 101-106
- J. Ouyang, M. Vincent, et al., "*Noninjection, One-Pot Synthesis of Photoluminescent Colloidal Homogeneously Alloyed CdSeS Quantum Dots*", J. Phys. Chem. C, 113 (13), **2009**, pp. 5193-5200
- B. Icard, L. Pain, V. Arnal, S. Manakli, J. Le-Denmat, P. Brun, M. Vincent, C. Soonkindt, B. Minghetti, et T. Matsumiya, "*45-nm node back end of the line yield evaluation on ultrahigh density interconnect structures using electron beam direct write lithography*", J. of Vac. Sci. & Tech. B, vol. 25, **2007**, pp. 124-129

International Conferences Papers

- M. Vincent, L. Chiesi, P. Rousset, C. Lapiere, C. Poulain, L. Carbone, F. Houzé and J. Delamare, "*An original apparatus for endurance testing of MEMS electrical contact materials*", Proc. of the 55th IEEE Holm Conf. on Electrical Contacts, **2009**, pp. 285-289
- M. Vincent, L. Chiesi, J.-C. Fourrier, A. Garnier, B. Grappe, C. Lapiere, C. Coutier, A. Samperio, S. Paineau, F. Houzé and S. Noël, "*Electrical contact reliability in a magnetic MEMS switch*", Proc. of the 54th IEEE Holm Conf. on Electrical Contacts, **2008**, pp. 145-150
- D. Briand, M. Vincent, D.C.T. Doan, G. Schürmann, M.C. Dang, N.F. de Rooij, "*Direct integration of carbon nanotubes on micro gas sensing platforms*", Proc. of IEEE Sensors Conf., **2006**, pp. 671-674
- C. Coutier, L. Chiesi, A. Garnier, J.C. Fourrier, C. Lapière, M. Trouillon, B. Grappe, M. Vincent, A. Samperio, S. Borel, C. Dieppedale, E. Lorent and H. Sibuet, "*A new magnetically actuated switch for precise position detection*", Proc. of Transducers **2009**, pp. 861-864