PROGRAMME GUIDE

MNE 2010

36th International Conference on

Micro & Nano Engineering

GENOA (Italy), 19-22 September 2010

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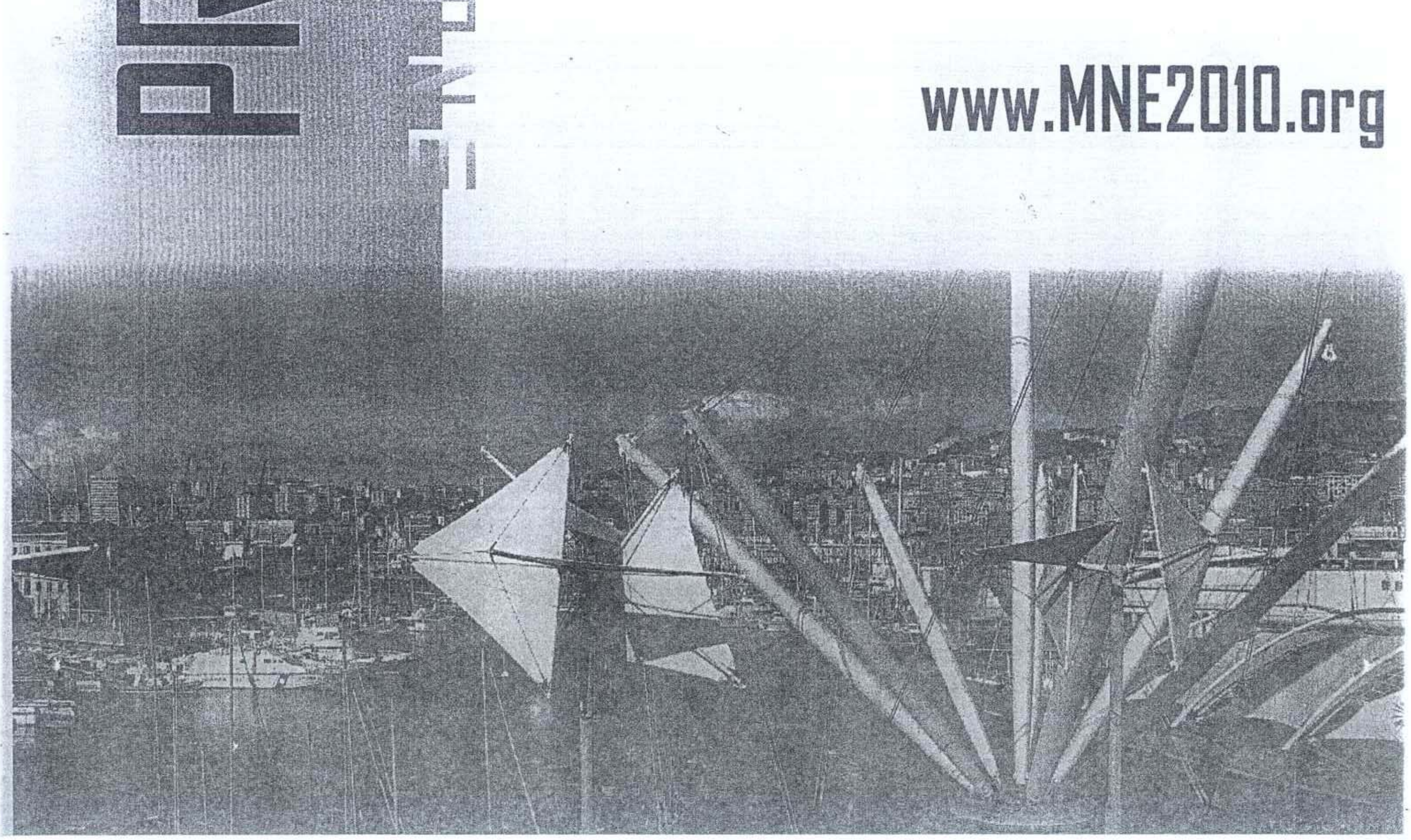

Programme at a glance

MNE 2010 Italy

Sun 19 September

- 09:00 - 10:30 — 2 Short Courses (ZEFIRO/ALISEO)
- 10:30 - 11:00 — Coffee Break
- 11:00 - 12:30 — 2 Short Courses (ZEFIRO/ALISEO)
- 12:30 - 13:30 — Lunch
- 13:30 - 15:00 — 2 Short Courses (ZEFIRO/ALISEO)
- 15:00 - 15:30 — Coffee Break
- 15:30 - 17:00 — 2 Short Courses (ZEFIRO/ALISEO)
- 17:00 - 20:30 — Exhibition
- 18:30 - 20:30 — Welcome Reception

Mon 20 September

- 08:00 - 08:30 — Welcome Coffee
- 08:30 - 09:00 (MAESTRALE) Welcome Address
- 09:00 - 09:40 (MAESTRALE) — Plenary I: Robert CHAU, Intel Corporation - USA
- 09:40 - 10:20 (MAESTRALE) — Plenary II: Susumu NODA, Kyoto University - Japan
- 10:20 - 10:50 — Coffee Break

LITH	NANO	MEMS
10:50 - 12:50 NANOIMPRINT I (MAESTRALE)	10:50 - 12:50 NANO PATTERNING & METROLOGY (BORA)	10:50 - 12:50 DEVICE AND TECHNOLOGY I (SCIROCCO-LIBECCIO)

- 12:50 - 14:20 — Lunch & Networking

LITH	NANO	MEMS
14:20 - 15:50 MASKLESS LITHOGRAPHY I (MAESTRALE)	14:20 - 15:50 PHOTONICS I (BORA)	14:20 - 15:50 DEVICE & TECHNOLOGY II (SCIROCCO-LIBECCIO)

- 15:50 - 18:30 — Poster Session & Reception, Odd Numbered Posters (LEVEL II)

Tue 21 September

- 08:00 - 08:15 — Welcome Coffee
- 08:15 - 08:30 (MAESTRALE) — Commemoration of Franco Cerrina
- 08:30 - 09:10 (MAESTRALE) — Plenary III: Peter FROMHERZ, Max Planck Institute for Biochemistry, Munich - Germany
- 09:10 - 09:50 (MAESTRALE) — Plenary IV: Bruno MURARI, STMicroelectronics - Italy
- MNE Fellowship Award
- 09:50 - 10:20 — Coffee Break

LITH	NANO	LIFE
10:20 - 12:20 NANOIMPRINT II (MAESTRALE)	10:20 - 12:20 MICRO & NANO MANUFACTURING (BORA)	10:20 - 12:20 MICRO & NANOFLUIDICS (SCIROCCO-LIBECCIO)

- 12:20 - 13:50 — Lunch & Networking

LITH	NANO	LIFE
13:50 - 15:20 MASKLESS LITHOGRAPHY II (MAESTRALE)	13:50 - 15:20 PHOTONICS II (BORA)	13:50 - 15:20 MICRODEVICES & SYSTEMS I (SCIROCCO-LIBECCIO)

- 15:20 - 18:00 — Poster Session & Reception, Even Numbered Posters (LEVEL II)
- 20:00 - 23:00 — Gala Dinner (Palazzo Ducale)

Wed 22 September

- 08:00 - 08:30 — Welcome Coffee
- 08:30 - 09:10 (MAESTRALE) — Plenary V: Kurt RONSE, IMEC, Leuven - Belgium
- 09:10 - 09:50 (MAESTRALE) — Plenary VI: Urs STAUFER, TU Delft - The Netherlands
- 09:50 - 10:20 — Coffee Break

MEMS	NANO	LIFE
10:20 - 12:20 NANO ELECTRO MECHANICAL SYSTEMS (MAESTRALE)	10:20 - 12:20 MICRO & NANO MANUFACTURING II (BORA)	10:20 - 12:20 BIO-NANOSENSORS (SCIROCCO-LIBECCIO)

- 12:20 - 13:50 — Lunch & Networking

MEMS	NANO	LIFE
13:50 - 15:20 BIOMEMS (MAESTRALE)	13:50 - 15:20 NANODOTS & NANOWIRES (BORA)	13:50 - 15:20 CELL INTERFACES (SCIROCCO-LIBECCIO)

- 15:20 - 15:50 — Coffee Break

LITH	NANO	LIFE
15:50 - 17:40 MATERIALS & DEVICES (MAESTRALE)	15:50 - 17:40 CNTS, GRAPHENE AND DIAMOND APPLICATIONS (BORA)	15:50 - 17:40 MICRODEVICES & SYSTEMS II (SCIROCCO-LIBECCIO)

to give an interpretation of experimental results; in particular measured electrical transport will be related to SiNW surface roughness, that drives the carrier backscattering of the SiNW.

P-MEMS-51 - Improved device performance in organic transistor diode using double insulator layer

Dong-hoon Lee * [1]; Jung-min Kim [1]; Yong-sang Kim [1,2]

[1] Dept. of Nano Science and Engineering, Myongji University, Youngin, Gyeonggi-do 449-728, Korea; [2] Dept. of Electrical Engineering, Myongji University, Youngin, Gyeonggi-do 449-728, Korea

In this paper, we fabricated the diode on glass substrate for RFID tag using OTFT and analyzed the electrical characteristics of OTFT diode.The electrical properties of OTFT was analyze before the analysis of diode. The threshold voltage is over -10 V which is very high for rectification. High threshold voltage cause decreasing the performance of diode due to lack of rectification time. Another problem is high leakage current which is also serious problem for rectification. To overcome these problems, we fabricated insulator of double layer. Hence, organic diode's rectification characteristic was enhanced about 10% by double insulator layer.

P-MEMS-52 - Fabrication of multiple fluidic-channels with uniform channel width in large area based on SU-8

Xiaojun Li * [1]; Yong Chen [1]; Keqiang Qiu [1]; Xudi Wang [2]; Yangchao Tian [1]; Shaojun Fu [1]

[1] University of Science and Technology of China, Hefei, China; [2] Hefei University of Technology, Hefei, China

In this paper, we propose and demonstrate a new method for fabrication large-scale, dense, smooth and vertical sidewalls silicon mould using holographic method combined with crystallographic anisotropic etching. Holographic method can make narrow dense and multiple continuous lines in large area while crystallographic anisotropic etching can eliminate line-edge-roughness and make the line nearly atomic-scale smoothness. Then the silicon mould is used as imprint mould for faithfully imprint of SU-8. Multiple fluidic-channels with uniform channel width in large area will be formed after imprint and an optimized bonding process.

P-MEMS-53 - Microcantilever Based Coupled Autonomous Impact Oscillators

Carl Anthony * [1]; Xueyong Wei [1]; Michael Ward [1]

[1] School of Mechanical Engineering, University of Birmingham, Birmingham, B15 2TT. UK

We report the fabrication and simulation of a system of two coupled microcantilever based autonomous impact oscillators. Different coupling strengths are obtained by different positions of the coupling spring between the cantilevers. For simulation of the rich time dependent motion of the system a lumped parameter model is used; where the pull-in force is a piecewise function that goes to zero on impact. The modeling and simulation showed that the transient behavior of the coupled system is very complex. A limit cycle motion of the driving cantilever is found while the sensing cantilever coupled to the master is chaotic.

P-MEMS-54 - Low-Pressure thermal bonding

Wang Xudi * [1]; Jin Jian [1]; Li Xiaojun [2]; Tang Qisheng [1]; Li Xin [1]; Fu Shaojun [2]

[1] Hefei University of Technology,China; [2] University of Science and Technology of China

Obviously, thermal bonding is key technology to achieve sealed polymer micro/nano-channel. The bonding process is usually carried out at high pressure to provide close contact. However, polymer will block up the fluid channel, and this method also difficult to obtain large area uniform micro/nano-channel. We propose a new method for the enclosure of the large-area channel by thermal bonding at low pressure using a flexible PET film material as bonding substrate. For the flexible substrate used, Low-pressure bonding process avoids channel structure fracture and can achieve uniform bonding in large area successfully.

P-MEMS-55 - Cross Coupled Beams CMOS-MEMS Resonator for VHF range with enhanced electrostatic detection

Eloi Marigó * [1]; Jose Luis Muñoz-gamarra [1]; Gabriel Vidal [1]; Joan Giner [1]; Francesc Torres [1]; Arantxa Uranga [1]; Nuria Barniol [1]

[1] Universitat Autònoma de Barcelona, Bellaterra, 08193, Spain

In this contribution cross coupled beams CMOS MEMS is presented in order to excite a second in-plane flexural mode at 250MHz and provide 4.3 times more transduction area than a single beam in order to enhance the electrostatic signal measurement.

P-MEMS-56 - Piezoelectrically actuated MEMS microswitches for high current applications

Davide Balma * [1]; Andrea Lamberti [2]; Simone Luigi Marasso [1]; Denis Perrone [1]; Marzia Quaglio [2]; Giancarlo Canavese [2]; Stefano Bianco [2]; Matteo Cocuzza [3]

[1] Xlab – Materials and Microsystems Laboratory, Department of Material Science and Chemical Engineering, Politecnico di Torino – Latemar Unit, Via Lungo Piazza d'Armi 6, IT 10034, Chivasso (Turin), Italy; [2] Center for Space Human Robotics, Italian Institute of Technology, Corso Trento 21, IT 10129, Torino, Italy; [3] CNR-IMEM, Parco Area delle Scienze, 37a, IT 43124, Parma, Italy

In recent years an increasing interest in integration and miniaturization has risen up for high current microrelays, which are mostly provided by traditional technology. In this field, MEMS microdevices allow significant improvements with respect to previous technologies: miniaturization and unique chip integration feasibility, minor power consumption and higher commutation velocities. In this work, a MEMS microswitch able to control currents in the order of 1A, with frequencies up to tens of MHz, was presented. This microrelay was piezoelectrically actuated by PZT thin film. A two-components device was designed in order to optimize the heat dissipation and control electrostatic effects.

P-MEMS-57 - Influence of channel width on the performance of an injection-type ballistic rectifier: Carrier injection versus hot-electron thermopower

Daniel Salloch * [1]; Ulrich Wieser [1]; Ulrich Kunze [1]; Thomas Hackbarth [2]

[1] Werkstoffe und Nanoelektronik, Ruhr-Universitaet Bochum, D-44780 Bochum, Germany; [2] DaimlerChrysler Forschungszentrum Ulm, Wilhelm-Runge-Straße 11, D-89081 Ulm, Germany

An injection-type ballistic rectifier is formed as asymmetric cross junction from narrow channels, where the injectors are inclined with respect to the straight voltage stem. Upon injecting electrons a positive voltage arises between the upper and lower part of the stem due to the inertial-ballistic motion of hot carriers. However, any difference in the confining potential of the upper and lower part of the voltage stem leads to a net hot-electron thermopower imposed upon the ballistic signal.
In this work we investigate the influence of the stem width on this two signal contributions.

P-MEMS-58 - SU-8 polymer based pressure sensor adapted passive RFID

Chang Yong Han * [1]; Dong Weon Lee [1]

[1] Department of Mechanical Engineering, Chonnam National University, Korea

This paper presents a novel wireless RF flow/pressure sensor, fabricated using SU-8 polymer to be operate in biomedical applications. To achieve highly simplified fabrication process and designs for high-reliable sensor operation, a passive wireless sensor has been researched. SU-8 polymer-based flow sensor is fabricated by microelectromechenical system(MEMS)-based batch process to reduce cost. The sensor consist of an inductor(L) interconnected with pressure-variable capacitor(C) to form an LC resonant circuit.