PROGRAMME GUIDE

MNE

MNE 2010

36th International Conference on

Micro & Nano Engineering

GENOA (Italy), 19-22 September 2010

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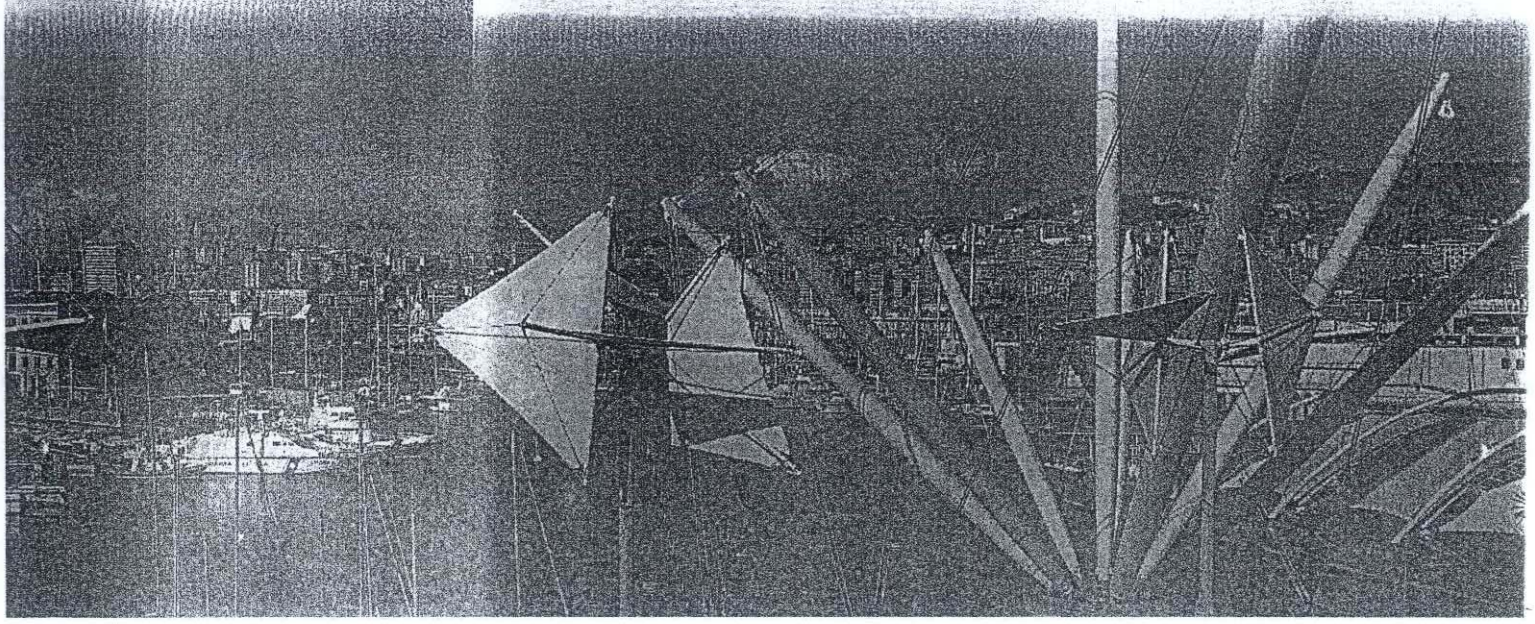

Sun 19 September

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 II (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 II (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 (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)

CNTS, GRAPHENE & DIAMOND APPLICATIONS

P-NANO-144 - Cu-MWCNT Composite Films Formed by an Electroless Plating Technique

Taishi Kanazawa * [1]; Susumu Arai [1]; Morinobu Endo [2]

[1] Department of Chemistry and Material Engineering, Faculty of Engineering, Shinshu University, Japan; [2] Department of Electrical and Electronic Engineering, Faculty of Engineering, Shinshu University, Japan

Cu-carbon nanotube (CNT) composite films were fabricated using an electroless plating technique. Commercially available multiwalled carbon nanotubes (MWCNTs) were used. Microstructures of the Cu-CNT composite films were examined by scanning electron microscopy. The electrical conductivity, the adhesion strength, and the friction properties of the Cu-CNT composite films were evaluated. The electrical conductivity of the composite films was lower than that of a copper film. The adhesion strengths of the composite films were almost the same as that of the copper film. The friction coefficients of the composite films were lower than that of the copper film.

P-NANO-145 - Dense high aspect ratio diamond nanostructures for X-ray microscopy and photonics

Sergey Gorelick * [1]; Joan Vila-comamala [1]; Vitaliy A. Guzenko [1]; Birgit Päivänranta [1]; Ray Barrett [2]; Christian David [1]

[1] Paul Scherrer Institut, CH-5232 Villigen, Switzerland; [2] ESRF, 6 rue Jules Horowitz, BP220, F-38043 Grenoble Cedex, France

We investigate high aspect ratio nanopatterning of diamond layers for applications in X-ray optics and photonics. We produced Fresnel zone plates made from diamond with diameters up to 500 micrometres and outermost zones of 100-200 nm with heights up 1.5-2 micrometres. Some of these first ever fabricated diamond zone plates were tested showing good diffraction efficiencies for hard X-rays focusing, as well as a good resolution performance. In addition we fabricated arrays of high aspect ratio nanorods and pyramids, and high aspect ratio diamond gratings with periods down to 200 nm.

P-NANO-146 - Carbon Nanotube Tipped Cantilevers Applied to Nanometrology in Dynamic Mode Atomic Force Microscopy

James Su * [1]; N. N. Chu [1]; M. H. Shiao [1]

[1] ITRC, NARL, Taiwan

Carbon nanotubes (CNTs) have attracted much interest in nanometrology. In this study, we analyze the statistical average grain size and uncertainty of measurement of Au grains measured by adopting focused ion beam (FIB) modified silicon tips and CNT tip. The statistical average grain size measured by adopting CNT tip remains consistent within 15% while by applying FIB modified silicon tips show large variations. The systematic analysis accorded to ISO/IEC 98-1:2009 and ASTM E 2382-04 indicates that the tip geometry effect is the key parameter and by applying the CNT tip in nanometrology will reduce the uncertainty of measurement effectively.

P-NANO-147 - A simple and versatile method for statistical analysis of the electrical properties of individual double walled carbon nanotubes

Florent Seichepine * [1,2,3]; Emmanuel Flahaut [1,3]; Christophe Vieu [2,3]

[1] Université de Toulouse ; UPS, INP ; Institut Carnot Cirimat ; 118, route de Narbonne, F-31062 Toulouse cedex 9, France; [2] CNRS-LAAS, 7avenue du colonel Roche,F-31077 Toulouse, France.; [3] Université de Toulouse,UPS, INSA, INP, ISAE, LAAS F-31059, France

Double-walled carbon nanotubes are potential candidates for new generation of on chip interconnections due to their metallic behavior. For large scale integration purpose it is mandatory to qualify their electrical properties in a statistical way. We thus propose a new methodology for characterizing in one step, the electrical properties of a large population of nanotubes. The method enables to obtain histograms of the conductance and maximum current density of individual nano-objects. The method has been applied on several type of DWNT. We finally obtain an accurate measurement on the effects of various post-synthesis treatments of these DWNT

P-NANO-148 - Graphene as a sensing element in pressure sensors

Ji-kwan Kim * [1]; Xiaohu Zheng [1]; Dong-weon Lee [1]

[1] Chonnam National University(Korea)

In this paper, we descried a design and fabrication of a graphene-based pressure sensor. Graphene films were successfully obtained by a mechanically exfoliating technique from graphite on silicon wafer with a thin oxide layer. Electrodes were formed using a lift-off process with a transparent photoresist such as SU-8. Shapes and thicknesses for the graphene layer were experimentally confirmed using an optical microscope and an atomic force microscope, respectively. Mechanical and electrical properties of various graphene films were observed using the micromachined pressures.

P-NANO-149 - Artificial tailoring of a carbon nanotube and its electrical properties under high-resolution transmission electron microscope

Takuya Nishijima * [1]; Ryuichi Ueki [1]; Yosuke Miyazawa [1]; Jun-ichi Fujita [1,2]

[1] Institute of Applied Physiscs, University of Tsukuba, Japan; [2] PRESTO JST, Japan Science and Technology Agency, Japan

Introducing an artificial structure into a carbon hexagonal network should realize new functionalities in its electrical properties, such as on-site two and/or three terminal molecular transistor and metal free catalyst. It is well known that Joule heating of a carbon tube (CNT) induces defect repair and local regrowth of the CNT; this has been observed with high-resolution transmission electron microscopy (HR-TEM). In this paper, we report the details of such a deformation process, coinciding with the changes in electric properties, observed under HR-TEM (JEOL JEM2100) utilizing a homemade nano-manipulator.

P-NANO-150 - The Role of pH in the Density Control of Ferritin-based Iron Oxide Catalyst Nanoparticles for Scalable Individual Single-walled Carbon Nanotube Growth

Kiran Chikkadi * [1]; Moritz Mattmann [1]; Matthias Mouth [1]; Lukas Durrer [1]; Christofer Hierold [1]

[1] Micro and Nanosystems, Department of Mechanical and Process Engineering, ETH Zurich, 8092 Zurich, Switzerland

We present a study on the influence of pH in the control of the surface density of ferritin-based iron oxide nanoparticles. At low pH, high coverage has been achieved, enabling very low ferritin solution concentrations, or equivalently, large solution volumes to be used for adsorption, thus making the individual carbon nanotube growth process scalable to wafer level.

P-NANO-151 - Dielectrophoretic assembly of carbon nanotube-based NEMS devices using floating electrodes

Didi Xu * [1]; Kaiyu Shou [1]; Simone Schürle [1]; Bradley Nelson [1]

[1] Institute of Robotics and Intelligent Systems, ETH Zurich, CH-8092 Zurich, Switzerland

We have investigated the floating-electrode dielectrophoretic assembly to achieve the desirable positioning and assembly of carbon nanotubes for NEMS devices. A hybrid electrode system with floating