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## PROJECT EVENTS

### Training Courses in nano-bioengineering, biomaterials and biocompatibility – first round finished

Chisinau, Republic of Moldova

September 15, 2011 – April 20, 2012



The first round of the „Training Courses in nano-bioengineering, biomaterials and biocompatibility” finished in April 2012.

This Training Course of 250 hours addressed 26 young researchers, PhD and MSc students who study solid state physics and electronics, microelectronics and nanoelectronics, biomedical engineering, biology, medicine and related fields, coming from universities, academic laboratories, SMEs and industrial companies.

The course started on September 15, 2011 and lasted 6 months till April 2012. The lectures were organised on Wednesday (17:00-20:00) and Saturday (9:00-14:00) at

the premises of the Technical University of Moldova, Department of Microelectronics and Biomedical Engineering.

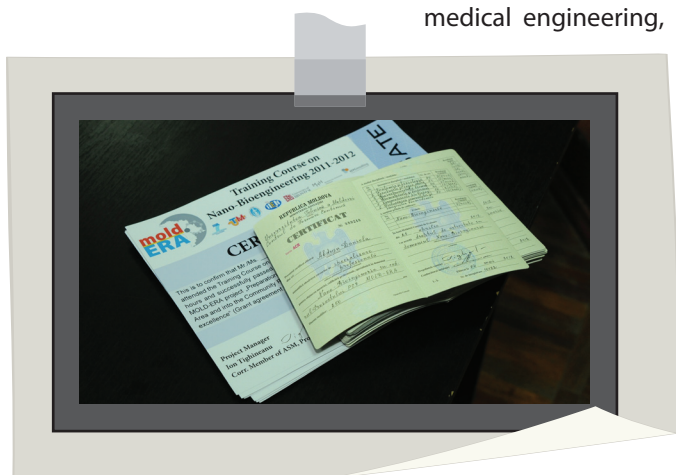
The lectures were presented by professors and researchers from the partner-institutions including: Hannover Medical School (Germany), Center for Device Thermography and Reliability (Bristol, UK), Technical University of Moldova, State University of Medicine and

Pharmaceutics of Moldova and Institute of Electronic Engineering and Nanotechnologies of the Academy of Sciences of Moldova. Several lectures were delivered online by professors from the UK, via the Great Western Research Post-Graduate Training Network in Materials. The training room was equipped with a multimedia system, including a PC, video projector, smart table, video conferencing system POLYCOM.

For every course, the students were presented paper handouts containing PPTs developed by professors. All courses in PDF format were placed on the MOLD-ERA project website.

The subjects delivered during the course included:

- Introduction to Biomedical Engineering
- Basics of Human Physiology
- Tissues and Molecular Engineering
- Medical Bioinstrumentation
- Digital Signal and Image Processing
- Biomaterials, Biocompatibility and Biosensors
- Methods of Functionalising Biological Objects with Nanomaterials
- Nanotechnologies in Medicine
- Spectroscopic Methods for the Study of Nanostructured Organic, Inorganic and Biological Materials
- Contemporary Methods of Study of Biological Objects and Nanomaterials





- Methods of Preparing Biological Samples for Microscopy Investigations
- Methods of Nanomaterials Fabrication for Bioengineering Applications

## Marie Curie Financial Workshop - more than useful

Chisinau, Republic of Moldova

February 28, 2012

An FP7 Marie Curie Financial Workshop was organised on February 28, 2012 in the framework of the MOLD-ERA project. The event was attended by 20 researchers from the State Medical and Pharmaceutical University "N. Testemitanu", Institute of Electronic Engineering and Nanotechnologies, Information Society Development Institute.

This one-day event provided a thorough overview of the Marie Curie Actions, details on funding and eligibility, financial and application procedure, as well as other useful resources and hands-on support to researchers. The feedback of participants was very positive and proved that there is much interest towards the mobility of researchers.

The workshop was delivered by Michael Remes from EFPC. EFPC manages the Financial Helpdesk ([www.finance-helpdesk.org](http://www.finance-helpdesk.org)), a helpdesk for the latest FP financial information.

The graduates of the training course have been awarded the Certificate of the Ministry of Education of Moldova, indicating the studied subjects, number of hours and the final exam mark.



## Webinars on FP7 issues

Webinars produced and presented by EFPC enable real-time remote training and support with full audiovisual and action features. This includes PowerPoint presentations, virtual "white board", co-browsing, polling and practical exercises.

Three rounds of webinars on FP7 issues have so far been organised in the framework of the MOLD-ERA project since April 2012. These events target researchers preparing FP7 project proposals, project managers and financial managers from various institutions and organisations in the Republic of Moldova. The modules are interactive and last between 1 and 1.5 hours.

The 3 rounds of webinars provided so far have focused on "Budgeting for FP7 Proposals" and "Eligible and Ineligible Costs".

For more information please visit

<http://mold-era.eu/10-04-12/webinar-budgeting-fp7-proposals>

<http://mold-era.eu/21-05-12/second-round-webinars-0>

<http://mold-era.eu/28-06-12/upcoming-webinar-eligible-and-ineligible-costs>



## 2<sup>nd</sup> Summer School in Nano-Bioengineering

Chisinau, Republic of Moldova

July 2-6, 2012

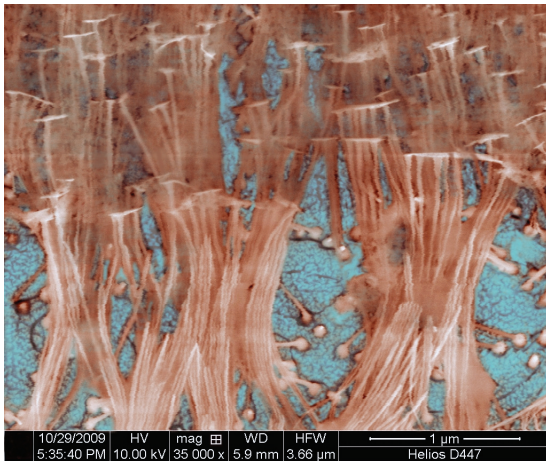
This was a unique opportunity for junior researchers, MSc and PhD students to update their knowledge. Lectures were presented by professors and researchers from consortium partners, including: Hannover Medical School (Germany), Center for Device Thermography and Reliability (Bristol), Technical University of Moldova, University of Medicine and Pharmaceuticals of Moldova and Institute of Electronic Engineering and Nanotechnologies.

This Summer School addressed PhD and MSc students, studying solid state physics and electronics, microelectronics and nanoelectronics, biomedical engineering, biology, medicine and related fields, coming both from academic laboratories and from the SMEs and industrial companies.

The main topics covered during the Summer School included:







- Introduction in bioengineering
- Nanotechnologies in biomedicine
- Human Anatomy and Physiology
- Bioengineering of tissues and organs
- Medical bio-instrumentation
- Modern biosensors
- Semiconductor-based bio-chemical sensors

The event gathered 34 junior researchers, MSc and PhD students. For more information, please visit <http://mold-era.eu/summerschool2012>



## FP7 Financial Issues workshop

Chisinau, Republic of Moldova

July 3, 2012

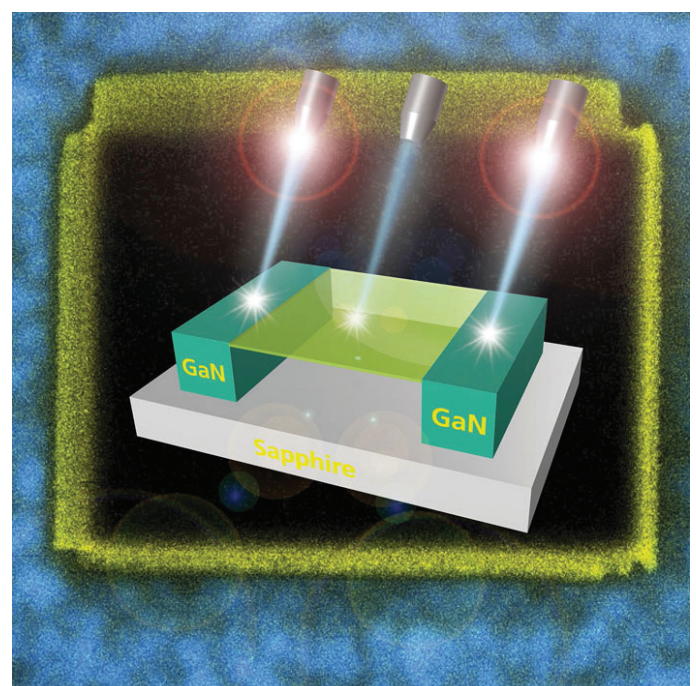
A training workshop on FP7 Financial Issues was organised in Moldova in July 2012. The training focused on funding schemes and regimes, eligible and ineligible costs, bookkeeping and financial reporting as well as other related topics. The aim of this one-day workshop is to ensure a more efficient and practical understanding of FP7 rules and regulations, mainly with regards to financial aspects and to increase success in submitting FP7 proposals.

## PROJECT NEWS

### Surface writing produces designer nanostructures

A new way to fabricate 3D nanostructures from gallium nitride using a focused ion beam (FIB) has been developed by researchers in Moldova, Australia, Germany and France. The technique, which involves directly writing a negative charge on the surface of GaN with the FIB and then photoelectrochemically etching the sample, allows ultrathin membranes and supporting nanocolumns to be fashioned in a controlled way. GaN is a large-bandgap semiconductor widely used in electronics applications such as high-temperature, high-power electronics and optoelectronics for light-emitting diodes and lasers. The material is also piezoelectric, so bridge-like GaN membranes might even find use in applications like nanoelectromechanical systems (NEMS).

Ion Tiginyanu and colleagues from the Academy of Sciences of Moldova and Technical University of Moldova recently put forward a new way to make nanometre-thin membranes of gallium nitride hanging over a network of GaN threading-dislocation "whiskers" that act as a support. Their fabrication technique was based on etching away highly crystalline material from the GaN bulk epilayers, leaving behind only the negatively charged dislocation networks and a thin surface film to which the dislocations remain attached.





The team has now found that ultraviolet light can be used to etch away the whiskers themselves, leaving the ultrathin membrane hanging in free space without any support. To reproduce support structures, the researchers looked at subjecting selected areas of the top surface of the sample to a FIB treatment at relatively high fluences. "Our goal here was to introduce more lattice defects into the material making some of the FIB-treated top regions opaque to ultraviolet light," explains Tiginyanu.

### High and low doses

To test their technique, the researchers subjected selected areas of a GaN sample to a focused beam of 30 keV Ga<sup>+</sup> ions at a dose of around 10<sup>13</sup> cm<sup>-2</sup>. They subjected the remaining surface regions to a gentler treatment with a lower fluence ion beam that induces trapped negative charges that then effectively shield the treated surface films against subsequent photoelectrochemical (PEC) etching. This part of the material remains transparent to ultraviolet light, however, so it can still be etched in depth.

As expected, the high-dose treated surface regions became opaque, so shielding the material underneath against subse-

quent photoelectrochemical treatment that produces nanostructures in form of nanowalls and columns. "These structures provide physical support for the ultrathin membranes above that emerge in the areas preliminarily subjected to the low-dose FIB treatment" says Tiginyanu.

### Different thicknesses possible

The researchers estimate that the thickness of the nanomembranes is about 15 nm, which is around the distance that the 30 keV Ga<sup>+</sup> ion beam can penetrate the GaN matrix. "Such maskless fabrication of ultrathin GaN membranes suspended on GaN nanostructures is fascinating, and we can produce membranes with different thicknesses by controlling the energy of the FIB too", he told nanotechweb.org.

The technique could be employed to make 3D nanostructures based on GaN and help make NEMS and photonic devices from this technologically important material, he added.

The work was reported in *Physica Status Solidi – Rapid Research Letters*.



## MOLD-NANONET – FP7 project aimed at integration of Moldova in ERA

MOLD-NANONET (Enhancing the capacities of the ELIRI Research Institute

in applied research to enable the integration of Moldova in the European Research Area on the basis of scientific excellence) is the second FP7 project in Moldova targeting the area of nanotechnologies.

The objective of MOLD-NANONET is to assist the ELIRI Research Institute to develop and implement a research strategy that will expand its activities and increase its level of excellence in micro-nano-electronics related to the development of intelligent systems, so that it can compete and collaborate with leading research institutions in Europe.

MOLD-NANONET will create a unified infrastructure in Moldova by integrating the R&D capabilities of the city

of Balti with those of the capital city Chisinau. Training activities will be opened up and integrate with activities in other relevant research institutions in Moldova and with the new Technological Park affiliated to ELIRI. MOLD-NANONET will stimulate the creation of a bridge between applied research and innovative business. Focus is on a new research and training program for young researchers at ELIRI and Balti in integrated nanostructure networks for implementation in intelligent systems.

The MOLD-NANONET project was launched in Chisinau, Moldova in December 2011, with a kick-off meeting in which representatives from all partner countries (Moldova, Romania, Germany, Portugal and Israel) participated. More information about the project and its activities is available at [www.mold-nanonet.eu](http://www.mold-nanonet.eu)

## Regional Project Joint Call announced in South-Eastern Europe

On May 15, 2012 the Regional Project Joint Call for proposals in Research and Skill Building in Cloud Computing was announced in 6 South-Eastern European countries.

Bulgaria, Greece, Moldova, Romania, Serbia and Turkey can apply for joint collaborative research projects to promote multilateral cooperation among universities, research organizations and enterprises with focus on several topics such as: studies on requirements for federated cloud computing infrastructures for R&E, joint dissemination and training activities in cloud computing, workshops and intensive trainings, study

on leveraging and combining e-Government and e-Science cloud solutions, data protection, security and confidentiality etc.

This call aims at projects with duration of one to two years. The maximum grant for projects will be 150,000 Euro and organizations from at least three eligible countries can participate in a project. Grant applications must be drawn up in English, using the eForm specifically designed for this purpose. More information about the call is available at [www.seera-ei-pjc.asm.md](http://www.seera-ei-pjc.asm.md).



## MOLD-ERA partners



**Institute of Electronic Engineering and Nanotechnologies, Republic of Moldova**  
[www.iieti.asm.md](http://www.iieti.asm.md)

The Institute of Electronic Engineering and Nanotechnologies (IEEN) is a leading research institution of the Republic of Moldova in the fields of nanotechnologies and electronics for medicine. It edits two scientific journals, namely Moldavian Journal of the Physical Sciences (in English) and Physics and Modern Technologies (in Romanian). The Institute collaborates closely with universities and research centres from Germany, UK, France, Poland, Romania, USA, Russia, Ukraine etc., and currently is involved in 5 international and 12 national projects.



**Technical University of Moldova, Republic of Moldova**  
[www.utm.md](http://www.utm.md)

The Technical University of Moldova is the only higher technical educational institution in the Republic of Moldova. At present, the University comprises 10 faculties, the teaching-didactic and engineering staff which adds up to over 1000 lecturers. The six research centres of TUM successfully apply into practice the University's research strategy, within numerous grants and research programmes.

The National Centre of Material Study and Testing (NCMST) within the Technical University of Moldova is a leading research centre in the fields of material science and nanotechnologies. The Centre's activity is focused on the development of novel nanomaterials and nanodevices for various applications, including electronics, photonics, plasmonics, bio-medicine etc. The centre plays a major role in education of a new generation of young specialists in materials science and nanotechnologies.

Department of Microelectronics and Biomedical Engineering offers learning programs modeled on: License degree, Master's degree, Doctor degree, compatible with the European accreditation system and adjusted to the requirements of the European learning process in following domains: Microelectronics, Nanotechnologies and Biomedical Engineering. One of department's priorities is the maintenance of ex-

cellence in research, while the scientific research is oriented towards projects in national, European and international programs.



**EFPC Ltd, Israel**  
<http://www.efpcgroup.com>

EFPC staff have strong technical backgrounds in areas including NMP, Health, ICT, Security and Ethical Management. They have considerable Framework Program experience covering the technical, financial and project management aspects, and in particular are experienced in introducing the Framework Program to countries and organisations outside the older established Member States by advising and assisting on how best to become successfully involved. EFPC were coordinators of the IST project Finance-NMS-IST which setup the Finance Helpdesk ([www.finance-helpdesk.org](http://www.finance-helpdesk.org)). They are partners in the Idealist FP7 project responsible for Quality Management and are also key players in several ongoing and recent projects such as LOG-SEC, INSEC and MOLD-NANONET.



**Academy of Sciences of Moldova, Republic of Moldova**  
[www.asm.md](http://www.asm.md)

The Academy of Sciences of Moldova (ASM) is authorised with the Government's competence in the RDI field. ASM collaborates on the basis of bilateral scientific agreements with various research institutions from all over the world, as well as develops relations with international organizations such as ALLEA, NATO, BSEC, CEI, U.S. CRDF, STCU, COST and others. During FP6, and now in FP7, ASM acts as NCPs hosting institution, thus having the responsibility for coordination and promotion of Moldovan participation in the Framework Programs, for a gradual integration into the European Research Area. ASM is presently involved in several FP7 projects.



**University of Bristol, United Kingdom**  
[www.bris.ac.uk](http://www.bris.ac.uk)

The University of Bristol has a declared commitment to excellence in teaching and learning within an environment of internationally recognised research. The University has become a major force in the region's knowledge economy and is a key player in Bristol being announced a "Science City" in the Chancellor's 2005 Budget statement.

The Applied Spectroscopy Group and Centre for Device Thermography and Reliability (CDTR) in Bristol is leading research on properties of semiconductor materials and devices on the mesoscopic and nano scale. This work has led to a number of successful collaborations with industrial and university partners and resulted in many scientific publications and conference contributions. Research in the CDTR is supported by grants from EC FP7, UK EPSRC, EC EDA, ONR Global, DARPA and others, also by various UK, German, French and US companies.



**Medizinische Hochschule Hannover, Germany**  
[www.mh-hannover.de](http://www.mh-hannover.de)

The Hannover Medical School (Medizinische Hochschule Hannover, MHH), founded in 1965, is one of the world's leading university medical centres. Due to its interdisciplinary research MHH has strong collaborative links with many academic and industrial research organizations worldwide.

MHH concentrates its research activities to unravel basic mechanisms which will be, in close collaboration with clinical facilities, translated into clinical research. The main research activities focus on Transplantation and Stem Cell Research, Infection Biology and Immunology as well as Biomedical Technology.

Research from the Department of Cardio-Thoracic, Transplantation and Vascular Surgery, Hannover Medical School has been awarded multiple prizes for achievements and innovations, thus representing one of the leading institutions in the field of cardiovascular tissue engineering and regeneration worldwide.