

**ERA-WIDE  
FP7-INCO-2011-6**

**NANOTWINNING  
PROJECT  
#294952**



## **Project full title:**

*Increase in opportunities for strategic collaboration in the field of nanotechnology via twinning of IOP with institutions of European Research Area*

# **NANOTWINNING Project Consortium**

## **Project Coordinator**

Institute of Physics of National  
Academy of Sciences of Ukraine

## **Project Partners**

University of Tartu

Estonia

University of Turin

Italy

Pierre and Marie Curie University

France

European Profiles A.E.

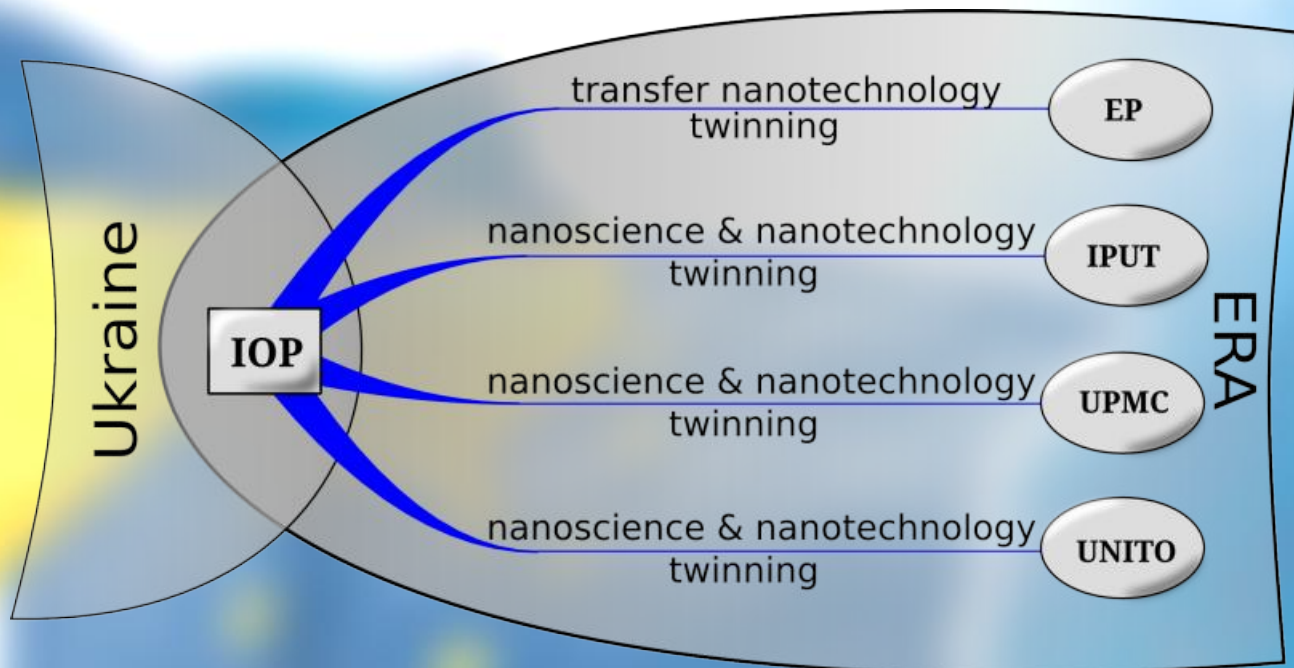
Greece



*The Nanotwinning project is funded by the European Commission under the FP7 Programme*

# Vision of Nanotwinning Project

To create new opportunities for collaboration in the field of nanotechnology via twinning of the Institute of Physics of NAS of Ukraine (IOP) with institutions of the European Research Area, such as European Profiles A.E. (EP), Institute of Physics of University of Tartu (IPUT), Pierre and Marie Curie University (UPMC), University of Turin (UNITO).



# International "Surface Enhanced Spectroscopy" Laboratory

The Institute of Physics assigned 3 rooms for the Joint Laboratory. Costs for repairs are own contribution of the Institute of Physics into implementation of Nano-twinning project.

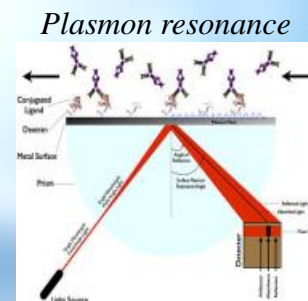
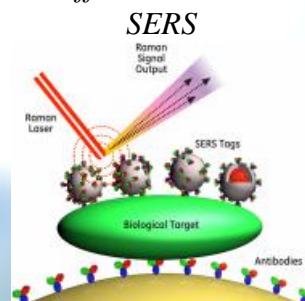
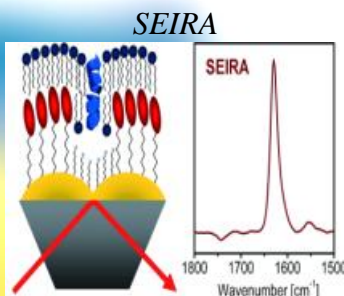
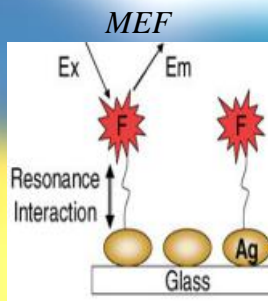


*Rooms of Joint SES Laboratory before repairs*

International SES Laboratory was created in 2012. This laboratory is established on a cluster principle and includes scientific groups from four Partners: IOP, IPUT, UPMC and UNITO. The laboratory is aimed at development and stimulation of different effects' investigation: Surface enhanced infrared absorption (SEIRA), Surface enhanced Raman scattering (SERS), Metal Enhanced Fluorescence (MEF) etc.

Activities of the Laboratory consolidate old contacts and create new relations with other scientific groups in the world working in similar directions.

*Main investigated effects:*



*Rooms of Joint SES Laboratory after repairs*

## Mission of the Joint Laboratory is as follows:

- Creation of conditions for the intensification of joint research in the field of infrared and optical spectroscopy;
- Coordination and integration of scientific research in different countries and accession to international scientific information space;
- Promotion of innovation and technology transfer on the basis of new knowledge use.

## Goals of the Joint Laboratory:

- Intensification of research, development of new technologies and materials based on research results, development of innovation and tech-



*International SES laboratory is equipped with Renishaw inVia Raman spectrometer. Purchase of this hi-tech device was made for the funds of Nanotwinning Project*

nology transfer;

- Involvement of young scientists, post-graduates and students in research.



*Researcher of the Laboratory in the process of measurement of SERS*

# International conferences NANOTECHNOLOGY AND NANOMATERIALS



International research and practice conferences “Nanotechnology and nanomaterials” NANO-2013 and NANO-2014 was held in Bukovel and Lviv, Ukraine in 2013 and 2014.

This conferences was held as large-scale international events, first three days of which were held in the format of International summer school for young scientists “NANO-TECHNOLOGY: from fundamental research to innovations” and next 4 days were continued in the format of International research and practice conferences NANO-2013 and NANO-2014.

The conferences focused on the latest advances in nanoscience and nanotechnologies and promoted profound scientific discussions between scientists and researchers from different disciplines and more than 16 countries.

Conferences gathered about 500 scientists working in the field of nanotechnology and nanomaterials, also in the fields that are on sidelines of scientific directions, among them many representatives of leading research institutes and higher educational establishments of Ukraine and Europe.



*Report of Prof. Francesco Bonaccorso, leading specialist in graphene investigations*



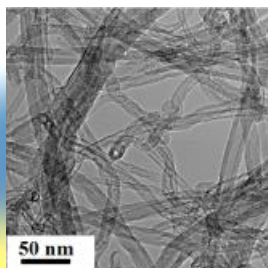
*Scientific discussion with audience*

# Outcomes of Scientific Cooperation

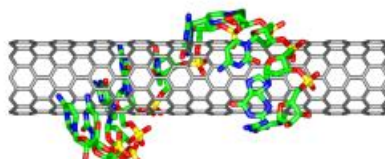
Scientific cooperation within the frame of Nanotwinning Project activities was implemented also in development of international project proposals. IOP for the last year participated in development of proposal within the following programs:

- Tempus IV Sixth Call for Proposals (EACEA/35/2012);
- FP7-INCO-2013-9 R2I-ENP;
- FP7-PEOPLE-2013-IRSES within the frame of Marie Curie actions;
- FP7-ICT-2013-X (FET Open Xtrack);
- NATO program “Science for Peace”.

Proposal submitted within the frame of FP7-PEOPLE-2013-IRSES was supported by European Commission and is on initial stage of its implementation.

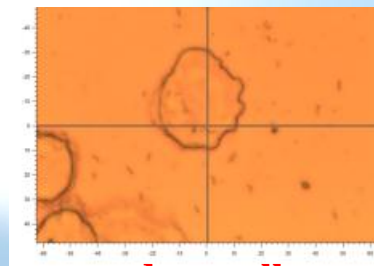


**MWCNT**



**SWCNT**

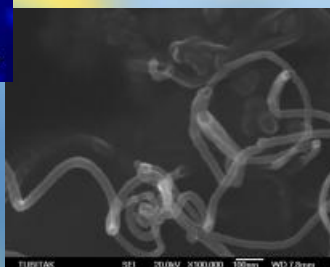
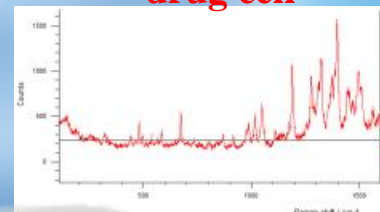
*Objects which we propose to investigate*



**drug cell**



**leukocyte cells**



**SWCNT**



**Graphene Oxide (GO)**

# Ukrainian - Latvian business forum

On May 14-15 2013, Institute of Physics of Academy of Sciences of Ukraine, which is the official partner of the Europe Enterprise Network (EEN), along with other partners of EEN-Ukraine consortium held Ukrainian-Latvian business Innovation Forum at the Great Conference Hall of the Ukrainian Chamber of Commerce and Industry. The purpose of the forum was to establish and deepen scientific and business contacts

between Latvia and Ukraine

Innovation Forum was attended by 25 Latvian organizations and more than 40 Ukrainian companies representing different areas of science and industry. The Opening of the Forum was attended by representatives of central executive power bodies of Ukraine. Forum was opened by representative of EU delegation to Ukraine, Mr. Enzo Damiani.



*Ukrainian - Latvian business forum was held in S2S and S2B formats*



## Within the activities of Nanotwinning Project Institute of Physics of NAS of Ukraine attended the following international events:

Manager and Expert of Nanotwinning Project took part in the Meeting of the Article 21.5 Partners of the Enterprise Europe Network (EEN) on 2-5 July 2012 in Brussels. They established there new contacts with scientists and innovation managers from Europe, Asia, USA etc, received new skills in stimulation and support of innovations, attraction of investments and development of effective system of technology transfer, listened to a series of lectures and trainings devoted to FP7 and its successor Horizon 2020. Also they discussed experience of participation in FP7 and opportunities for future collaboration within FP7 with representatives of different countries, including countries participating in the European Neighbourhood Policy.

From 31 October till 2 November 2012 Manager and two Experts of Nanotwinning Project made a visit to Latvian Technological Centre where they attended several trainings within activities of Enterprise European Network. Representatives of Latvian Technology Centre shared their experience on participation in FP5/FP6/FP7 projects, as well as on technology transfer, partnership establishment with high-tech enterprises, industrial associations and scientific institutions. In addition to trainings there were organized several meetings with Latvian institutes and associations, among them meeting with scientists of Latvian Institute of Atomic Physics and Spectroscopy.

*Manager and Expert of Nanotwinning Project, representatives of science and business from Russia, expert Dr. Gundega Lapina (Latvia) and Thomas Steiert - officer of European Commission, Executive Agency for Competitiveness and Innovation (Belgium) at the International Meeting, Brussels, 2011*



# Participation in International trade fair “Laser World of Photonics” in Munich

In 2013 IOP participated in International trade fair “Laser World of Photonics” in Munich.

As result of participation in this Fair cooperation two cooperation agreements were signed with German and Israel companies which are interested in joint production of laser energy meters. During the exhibition stand of IOP was visited by more than 70 representatives of various companies and R&D centers, including Kvant, Newport Corporation, Ophir, Coherent and others. Also Nobel Laureate in Physics Theodor W. Hansch visited the booth. IOP was the only organization from Ukraine, which participated in this event and exhibited its innovative products, that was the reason for raising of the Ukrainian flag together with other countries - exhibitors.

innovation cooperation



*Pyroelectric USB ALL-in-One Detector and  
Energy Meter: VEP-1*



*Participation at International trade fair “Laser World of Photonics”, Munich 2013*

# Broker technology meetings

In 2012 at the Institute of Physics of NAS of Ukraine the International Technology Meeting was held which was aimed at enhancement of cooperation between Ukrainian and European scientists in the field of nanotechnology; the study of the experience of technology transfer and strengthening of connections between science and industry.

## Target groups:

- Research and development organisations.
- Ministry of Science and Education of Ukraine.
- The Ukrainian State Agency for Science, Innovation and Informatization.
- Ukrainian Foundation for Entrepreneurship Support.



*Samples measurement Workshop from  
Expert of Renishaw plc*



*Prof. Andreas Otto (Germany) at  
Technology meeting, Kyiv, Ukraine*



*Main participants of the Technology meeting*

# Staff exchanges for young scientists

Nanotwinning Project provides 12 short-term scientific visits (1 week duration) for young researchers for training and exchange of good practices in nanotechnology at laboratories of the Project partners.



*PhD. Serhii Tomylko (Ukraine) with researchers of Laboratory of Laser Spectroscopy of Institute of Physics, University of Tartu, Estonia*

The conditions of granting are the following: Ukrainian scientists go to Europe and European delegates come to Ukraine; the age of applicants is not higher than 35 years; reasonability and effectiveness of training in the field of nanotechnology in the target institution is argued by applicant; permission for the work is provided by the target institution (it is possible in case of previous collaboration); grantee reports about the results of his or her scientific visit on the scientific seminar and shares experience with colleagues. Training in different European institutions extends the network of scientific contacts.



*PhD. Gabriele Alberto of Department of chemistry (University of Turin) received grant for short-term visit to Institute of Physics, Ukraine*

*PhD. Federico Catalano (Italy) doing the experiment in International SES laboratory (Ukraine)*



# International Summer Schools for young scientists

Institute of Physics of NAS of Ukraine together with other partners of Nanotwinning project organized International Summer School “NANOTECHNOLOGY: from fundamental research to innovations” in Ukraine. Such Summer Schools were held in 2012, 2013 and in 2014. Organizers provide 30 grants that can be won on a competitive basis; they cover participation in the Summer School and accommodation. In these Summer Schools more than 100 young researchers from Poland, France, Italy, Estonia, Belarus, Russia, Czech Republic, Hungary, Moldova, Ukraine and other countries have already participated.

Participation in the summer school opens the opportunity for young scientists to listen to a series of lectures on the fields of Nanosciences & Nanotechnologies. Scientists of worldwide reputation from universities and research centres

from Ukraine and Europe share their knowledge and experience.



# Science Festivals



Science Festivals were successfully held in 2012 and 2013. Ukrainian students from different physical, technical and mathematical lyceums, schools, gymnasiums, universities of Ukraine attended lectures that were presented in conference hall of the Institute of Physics of NAS of Ukraine. Lectures were delivered by scientists of the Institute and by young scientists of Nanotwinning project Partners (representatives of the University of Tartu (Estonia) and Pierre and Marie Curie University (France) in 2012 and of University of Turin (Italy) and the University of Tartu (Estonia) in 2013). Also there were organized excursions for students in the laboratories of the Institute of Physics such as cryogenic laboratory, laboratory of laser spectroscopy, femto-second laser center, department of coherent and quantum optics etc. In total the Institute of Physics within the Science Festivals received about 450 students in 2012 and about 400 students in 2013.

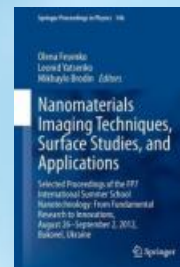
*Dr. Gabriele Alberto (Italy) and Dr. Vladimir Churmanov (Estonia) at the Science Festival April 2013, Kyiv*

# Publications

*Nanomaterials Imaging atechniques, Surface Studies, and Applications.*

*Selected Proceedings of the FP7 International Summer School Nanotechnology: From Fundamental Research to Innovations, August 26– September 2, 2012, Bukovel, Ukraine*  
DOI: 10.1007/978-1-4614-7675-7,

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*Nanocomposites, Nanophotonics, Nanobiotechnology, and Applications*

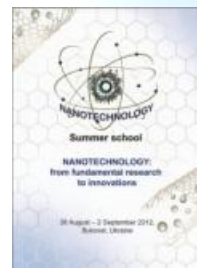
*Selected Proceedings of the Second FP7 Conference and International Summer School Nanotechnology: From Fundamental Research to Innovations, August 25– September 1, 2013, Bukovel, Ukraine*  
DOI: 10.1007/978-3-319-0661-0,

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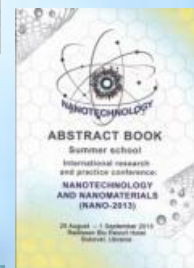
*Abstracts Book of the 1-st International Summer School*

*"NANOTECHNOLOGY: from fundamental research to innovations"*



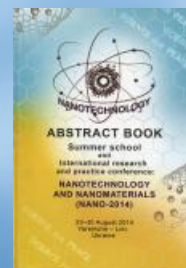
*Abstracts Book of the 2-nd International Summer School*

*"NANOTECHNOLOGY: from fundamental research to innovations" and International Conference "Nanotechnology and nanomaterials" (NANO 2013)*



*Abstracts Book of the 3-rd International Summer School*

*"NANOTECHNOLOGY: from fundamental research to innovations" and 2nd International Conference "Nanotechnology and nanomaterials" (NANO 2014)*



- Information about 1-st International Summer School was published at Eurobulletin - information issue of the EU Delegation to Ukraine.
- General information about Nanotwinning Project was published in article "From idea to its

implementation?.." in the newspaper "World".

- Information about SES Laboratory was published in article about SES laboratory in the newspaper "World" and journal "World of Physics".

# Mass media



Events organized within the frame of implementation of Nanotwinning Project aroused interest of mass media, they were covered by Ukrainian national TV channels.

International Summer School was covered by following TV programs: «Window to Europe» and «Intellect.UA» on 5<sup>th</sup> Ukrainian national channel.

At International Conferences "Nanotechnology and Nanomaterials" newsmen of "Window to Europe" and "Intellect.UA" Programs of 5<sup>th</sup> Ukrainian national channel were present, "Today" Program of TBi channel and "Social Pulse" of Tonis national TV channel, also Viche magazine.

Technology Meeting was also covered by the 5<sup>th</sup> channel of Ukrainian national television.

Other records you can find at websites of Nanotwinning Project, International Summer School and Conference (see contact information).





# Contact information

**Nanotwinning Project Website:** [www.iop.kiev.ua/~nanotwinning/](http://www.iop.kiev.ua/~nanotwinning/)

**NANO-2014 Conference website:** [www.iop.kiev.ua/~nanotwinning/conference2/](http://www.iop.kiev.ua/~nanotwinning/conference2/)

**International Summer School website:** [www.iop.kiev.ua/~nanotwinning/iss3/](http://www.iop.kiev.ua/~nanotwinning/iss3/)

**International SES Laboratory website:** [www.iop.kiev.ua/~nanotwinning/ses%20lab/](http://www.iop.kiev.ua/~nanotwinning/ses%20lab/)

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