



**Boosting EU-Ukraine cooperation in the field of Superhard Materials**

# NEWSLETTER No1

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## Boosting EU-Ukraine cooperation in the field of Superhard Materials

### About the Project

**START** is a Support Action initiative aiming at reinforcing the collaboration among research teams from the EU and Ukraine that are active in the domain of High Pressure Physics and Technology and its application areas in the various thematic areas of FP7/HORIZON2020, with special focus on the field of Superhard Materials.

To do so, START will orient its activities in supporting the V. Bakul Institute for Superhard Materials (ISM) of the National Academy of Sciences of Ukraine (NASU) to:

- ⇒ Analyse its research competencies, suggest actions to address the emerging scientific and socio-economic challenges in order to transform the Institute into the “flagship institute” in international cooperation
- ⇒ Build long-term collaborations with leading EU research teams towards:
  - the design and initiation of joint research activities and
  - the scientific knowledge and good practices exchange
- ⇒ Enhance its capacity towards the participation in EU-funded collaborative research activities

The Action Plan:

1. Analysis of ISM’s research competencies, scientific and technological developments
2. Examination of the EU/Ukraine’s collaboration framework in order to develop ISM’s long-term Research Strategy
3. Organization of variety training activities adjusted to the Institute’s support needs building ISM’s competencies towards its participation in future FP7/HORIZON2020 collaborative research activities
4. Twinning activities, to significantly increase ISM’s networking level as well as to facilitate the exchange of knowledge and good practices
5. Support of joint research activities implementation between ISM and leading EU research centres in the field of Superhard Materials
6. Facilitation of the research staff exchange between ISM and EU research centres, enabling them to carry out joint experiments

START is coordinated by ISM, which is the targeted leading research institute of Ukraine in the field of Superhard Materials, and mobilise a multi-disciplinary consortium of 4 partners (1 from Ukraine and 3 from EU countries), while its duration will be 30 months.



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### Expected results

The overall aim of the START project is to reinforce the cooperation between the EU and Ukraine in the context of the European Research Area (ERA). To do so, START focuses on the leading Ukrainian research institute in the field of Superhard Materials, *V. Bakul Institute for Superhard Materials of the National Academy of Sciences of Ukraine (ISM)*, and the project's diversified activities are aiming to strengthen ISM's international cooperation with EU leading research centres, advance its participation in collaborative research activities under FP7/HORIZON2020 and, eventually, transform it to a '*flagship institute*' for the country improving its cooperation capacity towards FP7/HORIZON2020.

To achieve this objective, a wide range of activities will be implemented, namely:

- Development of the Institute's medium-to-long term "Research Strategy" (including a concrete action plan for the next 2-3 years), by assessing the research competencies and networking level of ISM (its research strengths and weaknesses), as well as the existing international collaboration framework between EU and Ukraine (emerging opportunities and threats).
- Design and organisation of a number of well focused "FP7 training activities" in order to advance the Institute's competitiveness towards its participation in EU funded research activities under FP7/HORIZON2020.
- Implementation of a twinning activities set with EU research centres (networking, exchange of knowledge, best practices and scientific staff) to increase the ISM's visibility among EU leading research actors; agree and set up joint experiments with EU actors and facilitate discussion on scientific developments and industrial application areas in the field of Superhard Materials. The overall objective is to boost the production of scientific knowledge and have a positive influence on the global science and technology agenda, while addressing Ukraine's as well as the Eastern Europe and South Caucasus region's emerging socio-economic needs and challenges.



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### Passed events under START

The first meeting «Kick-off» meeting within the project “START” has been placed in the V. Bakul Institute for Superhard Materials on 5-6 December 2011.

This meeting was devoted to the planning of the START project in the near future, each partner role discussion, responsibilities and contributions of the various project tasks. Also, the EU representative, Thierry Devars expressed the viewpoint of the EU and his expectations from the project that is coordinated by V. Bakul Institute for Superhard Materials. The meeting was attended by:

**ISM Ukraine:** prof. N. Novikov, prof. Y. Nikitin, prof. B. Turkevich, prof. T. Prikhna, pgs. O. Ievdokymova, head division B. Lushpenko.

**UNIPRESS, Poland:** prof. S. Porowsky, prof. B. Pałosz

**CNRS-PPRIME, France:** prof. T. Cabioc’h, prof. J. Rabier.

**Q-PLAN, Greece:** Mr. J. Delioglanis.

The representative of the EU Commission - Thierry Devars.

Meeting with the participants from UNIPRESS (prof. S. Porowsky, prof. B. Pałosz, Poland) took place on 13-16 February 2012 at the V. Bakul Institute for Superhard Materials. Research topics for young scientists exchange were discussed and chosen.

The meeting was attended by:

**ISM Ukraine:** prof. N. Novikov, prof. Y. Nikitin, prof. B. Turkevich, prof. T. Prikhna, pgs. O. Ievdokymova, head division B. Lushpen, Dr. T. Basyuk, Dr. A.V.Kozyrev, Dr. D.V. Turkevich, Ph.D. Student A.A. Osadchiy, Ph.D. student T.B. Serbenyuk Ph.D. student A. Starostina, Ph.D. student A. Shaternik.

**UNIPRESS, Poland:** prof. S. Porowsky, prof. B. Pałosz



## Partners / Consortium

The international consortium of START project consist of several partners:

### 1) V.N. Bakul Institute for Superhard Materials of the National Academy of Sciences, Ukraine

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Country: Ukraine

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#### Short description:

V. Bakul Institute for Superhard Materials of the National Academy of Sciences of Ukraine - is a large science and technology centre. The Institute produces and applies synthetic diamond, cubic boron nitride and other superhard materials, high-density high-tech ceramics, and cemented carbides. It deals also with structural products and tools manufacturing of the above materials.

The ISM performs fundamental researches, science and technology developments in the following directions:

- investigations into physicochemical processes of making monocrystalline, disperse and film-like superhard materials over a wide range of temperatures and pressures, development of novel process of production ceramic and composite materials and products made of them;
- studies of physical, chemical and mechanical properties of new superhard materials;
- development of efficient tools, wear-resistant coatings and components of superhard materials and processes of their production;
- advancement of scientific principles of the development of efficient processes of machining metals and non-metallic materials with SHM tools as well as methods and processes of applications of SHM, including the use in designs of machine components and devices of a new generation;
- development of optimization process methods and controlling quality and performance of workplaces.



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### 2) National Centre For Scientific Research, Pprime Institute: Research and Engineering in Materials, Mechanics and Energetics, France

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#### Short description:

The Centre National de la Recherche Scientifique (National Center for Scientific Research) is a government-funded research organization, under the administrative authority of France's Ministry of Research. CNRS encourages collaboration between specialists from different disciplines in particular with the university. CNRS laboratories (or research units) are located throughout France, and employ a large body of tenured researchers, engineers, and support staff.

Laboratories are all on renewable four-year contracts, with bi-annual evaluation by the National Center for Scientific Research.

CNRS has the following missions:

- To evaluate and carry out all research capable of advancing knowledge and bringing social, cultural, and economic benefits for society.
- To contribute to the application and promotion of research results.
- To develop scientific information.
- To support research training.
- To participate in the analysis of the national and international scientific climate and its potential for evolution in order to develop a national policy.

CNRS's annual budget represents a quarter of French public spending on civilian research.

### 3) Institute of High Pressure Physics (IHPP), Poland

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#### Short description:

Institute of High Pressure Physics (IHPP, Instytut Wysokich Cisnien Polskiej Akademii Nauk), also known as "Unipress", was founded in 1972 by Polish Academy of Sciences. The Institute is directed by Prof. Izabella Grzegory. For the outline of Unipress history please see "history of Unipress" page.

Although the original focus of Unipress was on high-pressure studies of semiconductors, the present field of research activities also covers ceramics, HTc superconductors biological materials (high-pressure studies of protein folding, and high pressure food processing) and the plasticity of metals (hydroextrusion). The common axis of these studies is the use of high pressure, both as a research tool (a perturbation like temperature or magnetic field) and also as a technological method (high-pressure sintering, high-pressure growth of crystals).



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### 4) International Environment and Quality Services North Greece LTD Q-PLAN N.G., Greece

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#### Short description:

Q-PLAN North Greece Ltd focuses its activities on the field of management consulting and, particularly, the development and implementation of management systems, in which the company is the market leader in Greece. In addition, Q-PLAN possesses a vast experience with respect to the implementation of EU policy studies and to the design and coordination of SSA/RTD projects.

Q-PLAN offers:

- reliable high quality services for the implementation of Management Systems and their further certification in accordance with international standards, covering the whole relevant range
- a set of integrated business development services to enterprises and institutions of both public and private sectors
- Q-PLAN mainly undertakes the coordination and administration of these international projects utilizing its technical expertise on project management.



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### About ISM

The Institute's intellectual property is compounded by 125 monographies, more than 7 thousand scientific articles and more than 3 thousand authorship certificates and patents, 198 of which are received over the last 5 years. The Institute concludes and executes 20 license agreements. Employees advocated 49 doctoral and 289 master's theses. The Institute for Superhard Materials of National Academy of Sciences of Ukraine annually takes active part in international scientific projects, which are directed to the development and application of technologies for high pressure synthesis and sintering of structured materials in a broad range of pressures above 5 GPa and heating temperatures 500-2000 K.

Annually the Institute carries out, on the average, up to 60 - 80 research projects, more than 350 technical developments under agreements and contracts with institutions and companies of NIS and other countries. For the years of the Institute's activity, the members of its staff have been granted 2743 USSR and Ukrainian as well as 380 foreign patents, 27 licenses for the Institute's developments have been sold abroad. More than 100 books and 5500 papers have been published in the world leading journals by the researchers of the Institute. Monographs of the scientists are published in Japan, China, USA, and France.

ISM organized the NATO Workshop "Innovative Superhard Materials and Sustainable Coatings" in Kiev (2004). The proceedings of Workshop were published in NATO Science Series Book by SPRINGER in 2005. Furthermore, ISM carries out active international cooperation during many years on the development of new superhard and structural materials, within joint international projects with leading European research centers, such as the CNRSPPRIME (UPR 3346 CNRS Université de Poitiers) (FR), the Institute of High Pressure Physics Polish Academy Science (PL), the Institute of Photon Technologies (DE), the Consortium of High Technologies Researchers (CRETA/CNRS) (FR), the lab CRYSMAT/CNRS (FR), the Materials Technology Institute of Instituto de Cienciade Materiales de Barcelona (ES), the Atomic Institute of Technological University of the Technische Universität Wien (AT), etc



## Boosting EU-Ukraine cooperation in the field of Superhard Materials

### Contacts

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