



## Associazione nazionale di imprese e titolari di impresa per lo sviluppo delle scienze, l'istruzione e la cultura

February 1, 2013

St. Petersburg , Russia

# Report on the visit of the European scientific delegation to St. Petersburg from January 27 to February 1, 2013

## I) Participants

The delegation was comprised of the following members:

- 1) **Michael Grätzel** a professor at the École Polytechnique Fédérale de Lausanne where he directs the Laboratory of Photonics and Interfaces. He pioneered research on energy and electron transfer reactions in mesoscopic-materials and their optoelectronic applications. He discovered a new type of solar cell based on dye sensitized mesoscopic oxide particles and pioneered the use of nanomaterials in lithium ion batteries. Author of over 900 publications, two books and inventor or co-inventor of over 50 patents, he has been the Mary Upton Visiting Professor at Cornell University and a Distinguished Visiting Professor at the National University of Singapore. He was an Invited Professor at the University of Berkeley, the Ecole Nationale de Cachan (Paris) and Delft University of Technology. He is the Member of the European Academy of Sciences.

**2) Bernhard Kräutler**, Head of the Institute of Organic Chemistry at the University of Innsbruck, He was awarded silver medal of the ETH, Werner-Award of the Swiss Chemical Society, Ernst-Späth-Award of the Austrian Academy of Sciences, Erwin Schrödinger Award of the Austrian Academy of Sciences, Joseph Loschmidt Medal of the Austrian Chemical Society. He is the Member of the European Academy of Sciences.

**3) Gabriele Centi** is as full professor of Industrial Chemistry of the University of Messina and President of the European Federation of Catalysis Societies (EFCATS). He is also Director of the European Laboratory of Surface Science and Catalysis (ELCASS) created in 2001 by CNRS and University of Strasbourg (France), MPG and Fritz-Haber Institute of Berlin (Germany) and the University of Messina (Italy). He is coordinator of the Network of Excellence IDECAT (Integrated design of catalytic nanomaterials for a sustainable production) financed from the European Community (5 years project, starting from April 2005) which has the aim to create an European Research Institute on Catalysis to be the reference institute for catalysis research in Europe.

**4) Antonio Bianconi**- Director of the Rome International Center for Materials Science Superstripes RICMASS and full professor of the University of Rome. He has received world recognition for discovery of local structural features pertinent to cuprate superconductors, manganites, vanadium oxides, valence fluctuating compounds, cerium oxide, graphite and catalysts and metallo-proteins. He has published 320 papers in international journals receiving 8500 citations, with a Hirsh factor 49. He chaired series of workshops on high Tc superconductivity held in Erice (Sicily). He is the chairman of the series of conferences on "Stripes and high temperature superconductivity" held in Rome since 1996 and is the Member of the European Academy of Sciences.

**5) Paul Lecoq-** educated at the Polytechnic Engineer school in Grenoble (France), where he obtained his diploma with honors in 1972 and in parallel at the University Joseph Fourier in Grenoble, where he got his PhD with highest honors in 1974. Part of his thesis work has been accomplished in the Nuclear Physics department of the University of Montreal (Canada). Just after his PhD he was engaged at CERN as a fellow in 1974, then as a staff in 1977. During all his career at CERN Paul Lecoq has been involved in at least 5 large international experiments, in which he played a major role at the detector design and implementation as well as at the overall technical coordination level. Paul Lecoq has become in the last 20 years a worldwide recognized expert in the domain of heavy scintillating crystals. This collaboration has been instrumental in understanding the fundamental role of  $Ce^{3+}$  as an activator in many hosts, as well as in developing the high quality mass production of Cerium Fluoride ( $CeF_3$ ), Lead Tungstate ( $PbWO_4$ ) and Lutetium Aluminum Perovskite (LuAP) crystals, on which Paul Lecoq owns a patent. In order to support this research effort at the international level Paul Lecoq has initiated and chaired the SCINT series of international conferences on inorganic scintillators for physics and industrial applications: Chamonix, FR (1991), San Francisco, USA (1993), Delft, NL (1995), Shanghai, CN (1997), Moscow, RU (1999), Chamonix, FR (2001), Valencia, SP (2003), Alushta, Ukraine (2005), Winston Salem, USA (2007). The next one is scheduled in 2009 in South Korea. Around 1997 Paul Lecoq started to work on the translational aspect of his research in the field of ionization detectors for calorimetry. He tried in particular to promote technology transfer activities from particle physics to medical imaging. This was going first to a reorientation of the Crystal Clear program opening the fundamental research on new scintillators to the construction of medical imaging prototypes such as the ClearPET small animal PET scanner with a LuAP/LSO phosphor and the ClearPEM dedicated positron emission tomography for functional breast imaging. The next step was to organize a series of workshops and conferences, such as EuroMedIm2006, the first European conference on molecular imaging technologies. In parallel Paul Lecoq has been tirelessly trying to setup a European Centre for Research in Medical Imaging

(Cerimed) and to promote it at the European level. This centre, seen as an environment of synergistic exchange between all the disciplines involved in medical imaging and industry is now an approved project, which received funding from the French central and regional government to build a 2700m<sup>2</sup> infrastructure on the site of the university hospital La Timone in Marseilles. Paul Lecoq is now acting as technical director of this Centre.

- 6) Yanusz Lewinski**-Professor of Chemistry, Warsaw University of Technology, Poland Janusz Lewiński was born in 1956 in Poland. He did his undergraduate and doctoral studies at Warsaw University of Technology, and received Ph.D. degree in 1989 under the supervision of Professor S. Pasykiewicz. Then he joined the Department of Homogeneous Catalysis and Organometallics at the same University, where he first developed his interest in organometallic chemistry. Awards: Award of the Scientific Secretary of the Polish Academy of Science, 1989 Kemula Prize of the Polish Chemical Society, 2000, member of the European Academy of Sciences.
- 7) **Paolo Pizzichemi**- influential voice of the Italian industry, Vice-President of the Association representing more than 150 leading manufacturers, along with a supplier base of nearly 200 associate members – one of the largest membership in Italy. He became the eighth full-time chief executive of the association in 2007. Before that, he served a five-year term as administrator of the National Industrial Administration. As administrator, he regulated the nation's SMEs system managing 44,000 employees and a \$14 billion budget. During his tenure, he is recognized as a tireless safety advocate internationally. Pizzichemi instituted solid business practices at the agency that resulted in more than 97 percent of the agency's major programs coming in on time and on budget. Under his leadership, he launched the Next Generation Industrial Safety System. Born in Reggio, Pizzichemi received his bachelor's degree with honors in international studies from the University of Rome. He also attended Johns Hopkins University

School of Advanced International Studies for graduate work in Middle East Affairs.

**8) Luca Mazzotti-** oversees all financial operations for ASPI and focuses on global financial strategy and planning. He ensures that all offices practice fiscal responsibility in business dealings, and that we are fully accountable to shareholders, investors and governing bodies. He has over 15 years of experience in finance, primarily working with technology and technology-related services organizations. Prior to joining ASPI, he was Senior Vice President and CFO at the enterprise software and services company. Mazzotti has also contributed his financial and technology sector expertise to the Ministry of Finances as administrative general advisor. Earlier in his career, at Price Waterhouse LLP (now PricewaterhouseCoopers LLP), Mazzotti built a 15-year track record of success that included responsibilities as an audit partner and national director of the firm's auditing group. He holds a bachelor's degree from the University of Milano in business administration.

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## **II) Detailed evaluation:**

1) **Anti-Stokes Compounds and their Applications.** The author has developed and patented the technologies of anti-Stokes compounds synthesis of different colors that exhibit anti-Stokes properties after the excitation in the ultraviolet range. The drugs protection process has been proposed wherein the protection by means of anti-Stokes compounds is performed by the producer and the identification is directly conducted by the consumer.

Drugs protection against forgery and other objects is of a great importance presented on the market, for example in medical prescriptions, is one of the main problems of the European healthcare. The advantage of the developed by Petrik's technology is evident and may be regarded as a major breakthrough. Author's presentation stirs a substantial interest among the visitors who

expressed their willingness to start wide international collaboration on this subject in Europe and elsewhere.

**2) Cold destruction of carbon materials.** Petrik has reported on his discovery regarding manufacturing of Carbonic Materials, in particular, graphenes. An industrial production technology of graphenes has been elaborated, using the method of cold destruction used for the first time in history. The discovery of cold destruction may be viewed as pioneering. The technical solution of the method is based on the graphite restructuring using in highly reactive chemical compounds enabling the graphite decomposition into infinitesimally thin sheets. The discovery of graphite cold destruction may lead to a large number applications. By the same token the European delegation urges the author to carefully examine the presented applications using scientifically sound protocols. Author's presentation has also called for a wide international collaboration on this subject. The visitors manifested their interest in proving help for the testing of new materials especially for the purpose of their use in water cleaning.

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### **3) Platinum group metals extraction**

Petrik has also demonstrated his recent discoveries related to the extraction of platinum group metals using the gas-phase method. Petrik has demonstrated his discovery on the ability of platinum elements to form compounds under certain conditions leading to a complete separation of platinum metals. The delegation has underscored its interest in the demonstrated methods related to the extraction of the platinum groups metals and the production of catalysts underscoring the necessity of further elaborate studies aiming at the evaluation of the dispersion of metals and the toxicity of chemical substances used. The delegation stressed that the inventor's claim on the advantage of using special preparation of noble metal catalysts have to be sustained from data on the characteristics of the

materials and their reactivity in comparison with industrial standards.

#### **4) Other discoveries**

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Petrik has demonstrated other discoveries such as gamma-laser, extraction of osmium 187, etc... The delegation has examined these technologies and came to the following conclusion:

### **III) Overall results of the evaluation:**

V.I. Petrik is full Member of the Russian Academy of natural sciences, Russian technological academy, Petrovskaya academy of sciences and arts, International academy of sciences, ecology and nature, Honoured member of European university. The author of a number of scientific discoveries:

V.I. Petrik has established the following research centres in Russia: 1. In 1991 he established a private research laboratory being the first private research laboratory in new Russia. 2. In 1997 the Research institute of physics of fullerenes and new materials has been established being a limited liability company (LLC) and the first Russian private research institute, which founders are Russian Academy of natural sciences, The Fund's presidency program and V.I. Petrik, a natural person. 3. In 2007 the second private research institute has been established in Russia, Research institute of supramolecular systems and nanotechnologies LLC. V.I. Petrik is the author of two scientific monographs: «Optical armoured ceramics. Spinel. Published by Regional printing house», «Anti-Stokes compounds and technologies based thereon. Published by» Regional printing house No.1, Irkutsk, 2012. Victor Petrik is a creative inventor, the claims and conclusions that he derived from his experiments need to be substantiated by applying state of the arts scientific evaluation. His inventions may have a great impact in practical and academic



domain. The delegation has also underscored that Petrik's inventions may have an important commercial value and a strong economic effect. The European delegation recognizes that some of his inventions (for example, carbonaceous filter materials to improve the water quality) require further quantitative laboratory analysis following the internationally adopted protocols to convincingly substantiate claims. The European delegation expressed its interest in establishing collaboration on some of Petrik's discoveries and further exploitation of the results to large communities of European industries.

On behalf of the European delegation

Paolo Pizzichemi

Vice-President

Luca Mazzotti

Auditor



A handwritten signature in blue ink, which appears to be "Luca Mazzotti", written in a cursive style.