



SCIENCE & TECHNOLOGY  
CENTER IN UKRAINE



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Support of infrastructure for the support of innovative development  
centres in Ukraine.

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# Science and Science of Science

#3 2006

## Programs of the Science & Technology Center in Ukraine (STCU) and their Potential Effects on the Development of Prognosticating & Analytical Studies Executive Director, STCU

Today we are discussing how the Ukrainian science community can use S&T forecasting to orient its future activities. If Ukraine seeks to develop an “innovation economy” and integrate with the other modern economies of the world, it must develop a modern, forward-looking strategy in science and technology and a strong capability to turn its research potential into benefits for its national and global economic activity. A critical aspect of science forecasting should be to guide the development of a Ukrainian national science strategy by identifying emerging trends in global science and technology and linking Ukrainian research strengths to those trends.

In other words, S&T forecasting should be seen as identifying one side of a bridge, with the other side begin Ukraine’s science and technology potential. The bridge should bring information on the emerging science needs to Ukraine’s national science leadership, and in this way guide Ukraine’s plans on modernizing and strengthening its science and technology institutions. The bridge should also connect Ukrainian science capabilities to these emerging trends through national programs, international cooperation, and joint research collaboration.

Many existing programs, such as the U.S. Civilian Research and Development Foundation, the European technical assistance programs, and international programs like STCU have provided such bridges for Ukraine. Since the first projects started in 1995, STCU has acted to connect Ukraine to European and North America science communities, to develop partnerships with technology customers and research programs, to bring modern scientific equipment to Ukrainian institutes, and support the research of thousands of Ukrainian scientists, many from the former Soviet military research complexes.

The STCU is focused on preventing former Soviet military scientists from spreading their weapons knowledge, but a key element of its strategy is to emphasis research projects and other activities that help these former weapon scientists build successful avenues of civilian

research employment. In implementing this strategy, the STCU also works with non-military scientists and with the many Ukrainian research institutes that are the foundation of the Ukrainian S&T community. So STCU provides a bridge not only for ex-military scientists, but between Ukraine’s larger science community and the modern science and technology communities around the world.

How can current STCU programs serve to connect emerging global research trends and Ukraine? First, the STCU seeks to integrate Ukrainian scientists into the global science community through collaborative research projects. With over \$140 million US dollars invested in almost 990 STCU projects, there is a great potential for STCU projects to be used by national and local government agencies, universities, and commercial businesses both inside and outside Ukraine. These projects are made more valuable because of the collaboration with scientists from Canada, Europe, and the United States. This collaboration not only helps to improve the quality and relevance of the Ukrainian research to emerging research trends, but it also creates networks for professional information exchanges to better inform Ukrainian scientists about these trends.

STCU projects also help Ukrainian scientists received modern scientific equipment which increase the quality of the Ukrainian scientific research and provides opportunities to participate in emerging global research activities on an equal basis to other scientific communities. Further, STCU projects often represent “proof of concept” studies that provide an entry point for Ukrainian scientists into developing scientific trends.

Second, the STCU manages several programs to help scientists and institutes develop their capabilities and opportunities to work with other research programs and with technology customers, so that Ukraine receives both additional sources of research funding as well as direct connections to future research opportunities.

One example is the STCU program to develop a “tech-

nology transfer officer” within the selected Ukrainian institutes. In cooperation with Ukrainian institutes, western consultants and STCU are developing a targeted training program for a first group of Ukrainian institutes with capabilities and potential to benefit from an STCU-trained technology transfer officer. This Targeted Training activity will help the participating institutes develop their own ability to connect their research to the emerging science needs, and bring the benefits of those emerging trends to Ukraine and to the global science community.

Another important STCU activity is the STCU Targeted R&D Initiatives Program, which focuses STCU project funding on jointly financed projects that contribute directly to national and international science priorities. Through joint development, selection, and financing of specific projects, the STCU hopes to connect Ukrainian scientists directly to specific areas of emerging research interest that will benefit both Ukraine and the world. In 2005, STCU and the National Academy of Sciences of Ukraine conducted a Targeted Initiatives competition where approximately \$1 million US dollars in targeted projects were financed jointly by the Academy and STCU. Each project is focused on a Ukrainian national research priority in nanotechnologies, environmental sciences, biotechnology, and other technology areas. Other national science organizations and ministries, both in Ukraine and in other countries, are eager to have similar Targeted Initiatives, and STCU and the National Academy of Sciences of Ukraine have initiated a second competition for 2006.

Another example, the STCU Patent Support Program, provides funds to scientists to offset the expenses of patent applications, so that their research results can be protected and used in the Ukraine and other national economies without risk of losing any benefits to the scientists. Protection of intellectual property is important not only for financial reasons, but also for communicating to other research communities of the potential contributions Ukrainian science can make to future research

needs. To date, the STCU financially supported over 235 national, foreign, and international patents, helping secure this Ukrainian intellectual property in several important global technology markets.

Finally, the STCU Partners Program brings additional project financing to Ukraine from private companies, academic institutions, and governmental research programs. Beginning in 1997, the STCU Partners Program has attracted over \$40 million US dollars in research funding to Ukraine from European and North American private-sector and governmental agencies. Because of STCU's knowledge of the capabilities of Ukrainian institutes and technical units, STCU can connect Ukrainian scientists to these individual governmental programs and private sector customers that have specific research tasks and funding to fulfill those needs. Obviously, connections to partner organizations that are at the forefront of investigating emerging S&T trends brings direct information to Ukraine on what the future research needs will be in specific sectors, and this can help orient Ukrainian science towards meeting those future needs.

The STCU has developed good relationships with the scientists, institutes and national bodies of Ukraine and in other countries working with STCU. The STCU looks to integrate its nonproliferation mission with the need for Ukraine and other STCU member countries to improve their technological position and activity, economically and within global S&T communities. The STCU sees its projects and supplemental programs as useful ways for scientists and institutes to gain foresight on future global research activities, attract a wider variety of research income, and establish effective, sustainable, and successful long-term commercial and cooperative research partnerships. The STCU hopes to continue being a successful partner with Ukraine in targeting its scientific community toward the future of Ukraine's national development.

Thank you.

[www.maidan.org.ua](http://www.maidan.org.ua)

# STCU and NASU SELECTED PROJECTS FOR FINANCING

<http://www.maidan.org.ua/static/news/2006/1163718345.html>

There was a 23-rd meeting of Governing Board of Science and Technology Center in Ukraine in the capital's hotel "Radisson" on November 16, 2006. On the meeting there was STCU activity report 2006, financing of future STCU activity in 2007, approval of scientific projects financing in Ukraine, Azerbaijan, Georgia, Uzbekistan and Moldova, also there were announced 10 projects winners, which were selected for joint financing under the second phase of STCU and NASU joint project "Targeted R&D Initiative Program".

The total amount of financing of these projects is about \$1mln., half of the sum is paid by NASU and \$500 thousands are financed from STCU sources. It is the first time that the STCU and a recipient party have joined in cooperative partnership.

On October 13 in the Teacher's House during joint STCU and NASU conference were selected 10 R&D projects which were focused in the research areas of nanomaterials/nanotechnologies, energy conversation and industrial safety, information technology.

The STCU is an intergovernmental, non-profit organization created with the goal of aiding unemployed or underemployed scientists in Ukraine, Azerbaijan, Georgia, Moldova, and Uzbekistan who previously worked on the development of weapons of mass destruction for the Soviet Union.

The STCU was created and is governed by the 'Agreement to Establish a Science and Technology

Center in Ukraine', originally signed by Canada, Sweden, Ukraine and the United States. Subsequently, Sweden was replaced by the European Union; Azerbaijan, Georgia, Moldova, and Uzbekistan have also acceded to the agreement. The STCU finances projects that redirect the know how of the scientists, who were formerly involved in military programs, into peaceful sustainable civilian applications.

Other than partnership projects between former soviet scientists and scientists from Europe and North America, STCU manage researches which are financed by government organizations, commercial and non-commercial organizations of Canada, Europe, and USA.

Other than government funded projects, the STCU also works in a number of other spheres of activity: Matchmaking; Promotional Missions; Seminars and Workshops; Partnership Projects; Travel Grants; and Patent Support.

During 11 years of activity STCU financed almost 1000 R&D projects in Ukraine, Azerbaijan, Georgia, and Uzbekistan on a total sum about \$149 mln.

The STCU Secretariat is located in Kyiv and has field offices in Kharkiv, Lviv, Dnipropetrovsk, Tbilisi (Georgia), Baku (Azerbaijan), Chisinau (Moldova), and Tashkent (Uzbekistan).



# НАУКА ТА ІННОВАЦІЇ Science and Innovations

#6 2006

## STCU'S GOVERNING BOARD MEETING. RESULTS OF SECOND PHASE OF STCU AND NASU JOINT PROJECT "TARGET R&D INITIATIVE PROGRAM"

There was a 23-rd meeting of Governing Board of Science and Technology Center in Ukraine in Kyiv on November 16, 2006 and press-conference of its governing body. On the meeting there was STCU activity report 2006, financing of future STCU activity in 2007, approval of scientific projects financing in Ukraine, Azerbaijan, Georgia, Uzbekistan and Moldova, approving twenty-eight (28) new regular, government funded scientific projects and extensions for a total of \$687,869.00 and €2,731,390.00. The Governing Board also confirmed Eleven (11) new Partner Projects valued at \$770,822.00 and €345,488.00; and also confirmed were eleven (11) Partner Project contract extensions valued at a total of \$1,552,709 and €30,000.



There was a press-conference, the press conference participants were Zoran Stancic, Chairmen of the Governing Board (EU), Ann Polack, Governing Board Member (Canada), Victor Alessi, Governing Board Member (USA), Yaroslav Yatskiv, Governing Board Member (Ukraine), Andrew Hood, Executive Director of STCU during Governing Board Meeting.

Also there were announced 10 projects winners, which were selected for join financing under the second phase of STCU and NASU joint project "Targeted R&D Initiative Program". This project started in 2005 year, when STCU and NASU decided to co-finance projects focused on Ukrainian



national S&T priority areas. It is first example of cooperation of STCU and recipient- country as equal partners. The Governing Board approved ten (10) Targeted R&D Initiative projects in the research areas of nanomaterials/nanotechnologies, energy conversation and industrial safety, information technology for a total of USD \$354,076 and €111,995.

On behalf of NASU E. Paton, Anton Naumovets,. academician of NASU congratulated winners of the competition and handed over Certificates to project managers.

Nanomaterial / Nanotechnologies / Nanosystems

1. "Nanotubes production by electronic irradiation of layered superconductors towards insight into charge-density-waves and vortex matter". (Institute of Low-Temperature Physics, Kharkiv Physico-Technical Institute), project manager - Viktor Yeremenko.

2. "New nano-materials for thin-film solar cells based on complex chalco-

genides". (Institute of General & Inorganic Chemistry, Institute of the Physics of Metals), project manager Vasyl Pekhno.

3. "Development of new scintillation detectors based on A2B6-nanostructures for antiterrorist and medical radiation instruments". (Institute of Monocrystals, Scientific-Research Institute of Microsystems), project manager - Volodymyr Semynozhenko.



4. "Nanochemistry: synthesis and physicochemical characteristics of polyfunctional magnetic nanocomposites and their application in biomedical practice". (Institute of Surface Chemistry, Institute of Experimental Pathologies, Oncology, and Radiobiology, Institute of Hematology and Transfusions), project manager - Petro Horbyk.

5. "Development of Nanostructure Materials with High Emission Characteristics for Transformers of Solar Energy into Electric". (Institute of the Physics of Metals, Institute of Materials Science, Institute of Technical Mechanics), project manager - Mykhailo Nyshchenko.

6. "Nanostructural and Nanocomposite Materials for Cryogenic and Aerospace Applications". (Kharkiv Physico-Technical Institute, Institute of Low-Temperature Physics, Donetsk Physico-Technical Institute), project manager – Volodymyr Azhazha.

7. "Novel functional luminescent polymeric and hybrid nanoparticles and nanoassemblies with desired chemical and physical properties". (Institute of Condensed Systems Physics, L'viv National Polytechnic University, Donetsk Physico-Technical Institute), project manager - Myroslav Holovko.

## Energy Conservation & Industrial Safety

8. "Developing the new method of hydrogen accumulation under sunlight exposure". (Institute of Materials Science, Institute of General & Inorganic Chemistry), project manager – Yu. Solonin.

9. "Development of technology and prototypes of equipment for the electrochemical radiological decontamination of industrial equipment". (Institute of General & Inorganic Chemistry, Scientific-Engineering Center for Nuclear Welding of the Paton Institute, Nuclear Research Institute, project manager) - Anatoliy Omelchuk.

## Information Technologies

10. "The Ukrainian synchronous Network of Internet Telescopes (UNIT)". (Main Astronomical Observatory, Kyiv National University, International Center of Astronomical & MedicoEcological Research), project manager - Yaroslav Romaniuk.

It was noted that competition became popular among scientists. The number of proposals increased on 30% during the second phase of Target Initiative Program. Research groups from universities and institutes joined



to representatives of academician organizations. In that way this project assists to inter-departmental and interdisciplinary researches.

Next year it is planned to prolong joint program of STCU and NASU and to add projects connected with biotechnologies to competition theme.

## Silicon valley estimated at one's true worth ukrainian high-tech project

**The contest of technological business projects for venture investment within the framework of “Silicon Valley Open Doors - 2006” (SVOD) conference took place at the Computer Science Museum in the city of Mountain View (California, USA). Exhibitions of technological projects, their presentations to venture investors, as well as seminars on building of successful technological companies, development of hi-tech in the world and venture business in Silicon Valley, Russia and Ukraine, took place in the United States.**

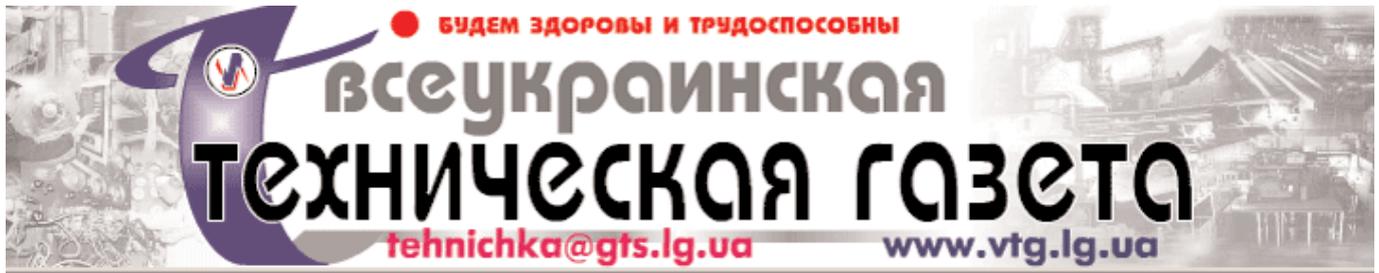
Representatives of the leading international venture companies were a part of jury of the contest. 16 projects from over 60 contenders were selected. Over 300 businessmen and venture investors from the United States and the CIS countries took place in the contest.

American-Ukrainian company ARST, based on Ukrainian technology of production of new sources of nourishment, ranked first in the contest. ARST received the title “The Most Investment Attractive Company of

2006” and the award “Golden Lock”. Projects from Russia ranked second and third.

Six new companies, based on Ukrainian technologies, made presentations to venture investors in the course of the conference. Two of these projects – ARST and “Semetrics” – are finalists of the All-Ukrainian High Technologies Contest. Another finalist of the contest – project Lileya (piezoelectric micromanipulators) was presented at a techno exhibition which took place within the framework of the conference due to the support of the Science and Technology Center in Ukraine (STCU).

ARST company which received initial investments from “Techinvest” was created by a team of Ukrainian scientists in 2006. “Techinvest” also financed the necessary R&D, intellectual property protection, marketing and legal analysis, helped in the elaboration of business strategies and business plan, development of partner network, search of clients and professional management, as well as in the creation of research production.



#48 (204), November 30, 2006.

# EVERY LITTLE HELPS

*Marina Savinova*

There was a 23-rd meeting of Governing Board of Science and Technology Center in Ukraine in Kyiv on November 16, 2006 and press-conference of its governing body. On the meeting there was STCU activity report 2006, financing of future STCU activity in 2007, approval of scientific projects financing in Ukraine, Azerbaijan, Georgia, Uzbekistan and Moldova, also there were announced 10 projects winners, which were selected for joint financing under the second phase of STCU and NASU joint project "Targeted R&D Initiative Program". This project started last year and is unique arrangement, which demonstrates STCU and Ukrainian cooperation as equal partners.

Just to remind, The STCU is an intergovernmental, non-profit organization created with the goal of aiding unemployed or underemployed scientists in Ukraine, Azerbaijan, Georgia, Moldova, and Uzbekistan who previously worked on the development of weapons of mass destruction for the Soviet Union.

The STCU was created and is governed by the 'Agreement to Establish a Science and Technology Center in Ukraine', originally signed by Canada, Sweden, Ukraine and the United States. Subsequently, Sweden was replaced by the European Union; Azerbaijan, Georgia, Moldova, and Uzbekistan have also acceded to the agreement.

STCU works 11 years in Ukraine and finances projects that redirect the know how of the scientists, who were formerly involved in military programs, into peaceful sustainable civilian applications. Scientists obtained grants for researches in next areas: environment protection, renewable energy, biotechnology, materials science, it helped to integrated Ukrainian scientists to world scientific community.

STCU coordinate researches which are financed by government, commercial and not commercial organizations



of Canada, Europe and USA. Other than government funded projects, the STCU also works in a number of other spheres of activity: Matchmaking; Promotional Missions; Seminars and Workshops; Partnership Projects; Travel Grants; and Patent Support.

The total funding to date for 11 years STCU Governing Boards stands at about 1000 Ukrainian, Azerbaijan, Georgian, and Uzbek R&D projects approximately \$149 million.

The Targeted R&D Initiative Program was launched in 2005 by the STCU and National Academy of Sciences (NASU) in co-funding the science projects in S&T areas of national priority. It is the first time that the STCU and a recipient party have joined in cooperative partnership. Selected projects are focused on national S&T priority areas of the Ukrainian government. During this second round, Targeted Initiative projects were focused in the research areas of nanomaterials/nanotechnologies, energy conversation and industrial safety, information technology. Under the second phase of this cooperative Program the STCU and NASU co-finance, about \$ 1 mln will be spend on 10 selected projects. It is very important, that Program is first example of equal partnership of STCU and Ukraine as recipient-country, it was more that once repeated on the STCU press-conference.

- At the Governing Board Meeting we have actively discussed our main future activities directions, - is saying the Head of the Governing Board, representative of the



European Union, Zoran Stancic, - and intend closely to cooperate with the Ukraine in the future, promoting its development. The European Union invested the amount of 180 millions of Euros in 2006 for science and technology development in the Ukraine. Only a part of the money is directed toward the future work of the STCU when the rest of the amount is designated for

resolving other global tasks of the country development. European Union plans to fund the work of the Ukrainian Science and Technology Center further. We took such obligation for the following two years.

In the opinion of the STCU Executive Director Andrew Hood what's most important in the work of the Center is to create conditions for full-fledged work for the scientists of Ukraine, Moldova, Uzbekistan, Georgia and Azerbaijan. From the other hand, Ukraine is in the process of integration into the World's Science Community therefore foreign partners need to practically see potential abilities of Ukrainian specialists.

- We have got specific projects and initiatives, - says Andrew Hood, - helping scientists to conduct researches, protect their intellectual rights for their inventions, search for new sources of financing for their scientific activities.

An appearance of the STCU Governing Board member, USA representative Victor Alessi was accordant:

- Our projects are called to become one such engine which sets in motion science development in the Ukraine. For this reason we complete so called Partners Programs where not only special purpose financing is used designated for STCU but also means from different sources of funding both governmental and non-governmental. For example, we have the Program called IPP which is directed toward partner development between scientists of Ukraine and business representatives from USA. Soon other representatives from Russia and Kazakhstan will also join it. Owing to this project implementation over three thousands steady working places for scientists, technologists and engineers from FWE are created.

About joint financing with NASU of priority Ukrainian spheres I could say that STCU's initiative are aimed on industrial society development and to provide possibility for develop S&T talents in order to find worthy place in society. Among priority spheres I could name – nan-

otechnology.

Ann Pollack (Governing Board member from Canada) said that participation in STCU work is one among four main nonproliferation activities in her country in the framework of global partnership.

Ukraine is represented in Governing Board by NASU academician Yaroslav Yatskiv. During his speech he said that last years Ukraine became one of the Center's financing country.

- I would like to point out few components of STCU activity- said Yaroslav Yatskiv. Help in integration of Ukrainian science to world system is very important beside financial support. Ukraine is equal partner in this Center's activity. We provide taxes benefit and custom courts reduction. Annually Ukrainian party pays \$200 000 for STCU office rent. Beginning from the previous year Ukraine pay about \$500 000 on joint projects financing. Foreign payments comprise less than 10% of total science financing in country that is why I do not want to speak a lot about finances. Our main duty is to control spending of this money in order to Ukrainian innovation development and competitiveness increase.

Other aspect, which I want to illustrate, is big quantity of corporate projects, for example, Ukrainian-Azerbaijan projects, Ukrainian-Georgian projects. Within the projects funded were the first joint projects funded with Moldavian scientists. STCU is ready to provide serious financial and organizational support to such initiatives.

We are grateful for real STCU patent support: all successful regular projects could obtain patents of others countries for STCU money. We are grateful for conference organization, business travel to others countries and matchmaking initiatives. Existing partnership projects are very important for Ukrainian business development. It is also profitable for our foreign colleagues. Foreign partner almost all sum without taxes could spend on project execution, only 5 % is paid to Center for its service. Ukrainian scientist is not only integrating to other country's business, but has unique job experience. Each year number of partner projects is increasing. So we can see who is who in Ukraine and who can really implement own developments assisting to S&T and innovative development of our country.

Of course, not everything is perfect in organization, where I represent Ukraine, we have our own difficulties. Transparency of our organization can be example for other organizations in Ukraine.

Anton Naumovec (NASU vice-president) handed over documents on projects financing to project managers.

In our opinion realization of the project is successful. –said Anton Naumovec. –The main thing is, that general effective mechanisms was created, which combines STCU activities with relatively new for Academy approach for scientific researches financing. Comparing with previous year, quantity of application increased in 3 times. It means that competition became popular. Very important also is that point that this year research groups of universities and institutes jointed to representatives of academician organizations. In that way this project assists to inter-departmental and interdisciplinary

researches.

Simultaneous examination of applications by Ukrainian and Western experts is useful and interesting. Our decisions were not always the same, this illustrates difference of interests of associated parties. Probably for future improvement of the procedure we need not only to provide trainings, but to arrange meeting of experts in order to develop common approach to expertise.

I want to admit, that previous year NASU proposal about program expansion on the former USSR

territory, on countries which are STCU recipient now. For example, we know that such programs are held in Georgia now. We welcome such actions and propose to establish competition of integrated projects in future.

We try to use new developments that are why we pay attention to nanotechnology and energy saving technologies at our joint projects. Academy proposes to

include projects connected with biotechnologies to competition theme.

We believe that Ukrainian scientists' proposals will be supported, because first experience of NASU & STCU was productive. This theme will be developed, by words of Andrew Hood, STCU plans to develop it actively, developing partner projects. With this aim Public Outreach Department was created in the Centre. STCU's Executive Directors hopes that its work will help government and people to understand better potential possibilities of fruitful and mutually beneficial cooperation.



# Retort over the heart

**Ukrainian scientists have created a unique device which can discover cardi-ological diseases at a very early stage.**

*Now problems with the heart can be detected long before the danger of a heart attack has become a reality. A unique laboratory where the thinnest magnet signals of the heart are measured and, therefore, the illness is discovered at the very early stage has opened at the Academician N.D. Strazhesko Kiev Cardiology Institute.*



## They searched for submarines but found a heart attack

Peaceful device for analysis of the heart's work has come into being due to military developments. As early as in the Soviet times the employees of the V.M. Glushkov Cybernetics Institute of the National Academy of Sciences of Ukraine were developing an ultra-sensitive equipment for discovery of anomalies of magnet fields. A device has come into being which can with equal success both find submarines at the depth of 30-40 meters, and measure the magnet field of the heart of a human being.

According to the project of the Science and Technology Center in Ukraine (STCU), the scientists have put the finishing touches on the technical side of the development, and with the support of German company SQUID AG have created an ultra sensitive magnetocardiographic system (MCG-7) - a unique device which has no analogs.

## How to distinguish the heart from a trolley bus

For the first time in the world, Ukrainian scientists have managed to create a magnetocardiographic system

which is able to function in a normal room. In the West, such systems work in screened rooms which push back the outer hindrances. The screens are produced from special sufficiently expensive alloys. Because the signal of the heart is million times weaker than magnet noise in which we are constantly being, it comes from electric outlets , lamps, mobile phones, trolley buses outside... "Imagine a fiddle that sounds near a jet... We should not only have heard the voice but all nuances of the play as well" – tells Vladimir Sosnitsky, one of the authors of the development.

## Microscope instead of a cardiogram

...You lie down a comfortable couch and relax for 10-15 minutes. And at the same time a sensor that looks like a big white retort, is hanging over the heart and catching weak magnetic fluxes which are intensified, filtered and go into a computer.

"Behind the usual electrocardiogram we cannot see what is taking place at the level of aggregate of cells of a certain field of the heart, cannot see local changes. Therefore, I would call magnetocardiographic examination a modern electro-physiological microscope," – tells the head of medical direction of development, Professor Aleksandr Parkhomenko.

“The uniqueness of magnetocardiographic method lies, first of all, in the fact that it detects an illness at a very early stage, when functional disturbances appear – first precursors of possible catastrophes or pathological changes, and clinical manifestations are still lacking”, - head of magnetocardiographic laboratory Vladimir Sosnitsky goes on. By the way, even in the USA (with their level of development of medicine) 70% of people suffering from heart-vascular diseases, die suddenly.

### **Clinical examination for polar explorers and football players**

The scientists think that people of all socially dangerous occupations must definitely undergo the clinical examination with magnetocardiograph. These are pilots of war-planes and high-speed air liners, operators of pow-

erful energetic objects, for instance, nuclear or heat power stations, public transport drivers, and others. This group can also include sportsmen, especially “expensive football players”, who more and more often suffer from the syndrome of a sudden death, as the doctors say. By the way, Ukrainian explorers of the South Pole were the first who were examined with the magnetocardiograph. But total clinical examination with the use of this miraculous device is still far away. Now there exists only one place where one can undergo clinical examination – magnetocardiographic laboratory at the Academician N.D. Strazhesko Kiev Cardiology Institute. Cardiological clinics of Ukraine are supposed to be equipped with these devices. But meanwhile more active interest to this development of Ukrainian cybernetics and medical doctors is displayed abroad, for instance, in China...

# НАУКОВО-ПРАКТИЧНИЙ ЖУРНАЛ ІНТЕЛЕКТУАЛЬНА ВЛАСНІСТЬ

30.11. 2006.

## STCU DETERMINES HOW MUCH AND FOR WHAT TO PAY

Science and Technology Center in Ukraine decided to finance scientific projects on total sum about \$7 mln. In accordance with Center's announcement on November 16 in Kyiv Governing Board funded 28 regular scientific projects and 11 partner projects contracts extensions. Within the projects funded was the first project to be funded in the Republic of Moldova.

In particular, STCU together with National Academy of Sciences selected 10 scientific projects in order to finance about \$100 thousands on each. The Centre and Academy will co finance these projects as equal partners. During this second round, Targeted Initiative projects were focused in the research areas of nanomaterials/nanotechnologies, energy conversation and industrial safety, information technology. The Center's Governing Board also agreed to start third round of joint program.

Governing Board consists of representatives from Canada, EU, Ukraine and USA. The STCU Governing Board meets on a semi-annual basis in order to determine the Center's policies and funding for scientific projects. The total funding to date including all twenty-three (23) STCU Governing Boards stands at approximately \$150 million.

The STCU was created by Canada, Sweden, and the United States initiative in order to redirect the know how of the scientists, who were formerly involved in military programs, into peaceful sustainable civilian applications. During exclusive interview for "Intelektualna vlasnist" representative of EU Zoran Stanchich pointed that there are others reasons for financing STCU's projects to day for EU:

"In our opinion the main reason is the question that

Ukraine play big role as a neighbor of EU and it is stable region, understanding this STCU has to reformulate its mission."

"Science is aimed on future. It is realized in building productive capacity in Ukraine, scientific research for Ukrainian citizens, for improving level of life, environment protection etc. All these are long lasting process. This is the reason of our interest in participating in STCU. Although it is only part of interests of EU in Ukraine"- said chairman of the Governing Board.

Academician Yaroslav Yatskiv, member of Governing Board from Ukraine pointed that beside financial support more important is help in integration of Ukrainian science into world scientific system.

"Foreign investment is less than 10 percent financing of Ukrainian science. We have to think how to use these 90 percent for innovative development and competitiveness of our country"- said academician.

Scientist thanked STCU for financing getting foreign patents, for matchmaking travels, he pointed advantage of STCU partnership projects. "Foreign author or person, which propose project almost all sum use without taxes for performance for him partnership work. STCU takes only 5 percent for service. Ukrainian partner not only integrate to foreign country's business, he get unique experience of cooperation. The amount of these partner projects growth every year. We can see who is who in Ukraine, who really can implement developments. Looking through list of partner projects we can see which institutes can really help scientific-technological and innovative development of our country." added Ya. Yatskiv.



## Comercialization of innovations From Science to business The Science and Technology Center in Ukraine conducted the international seminar “From Science to Business” in Kiev



### Alexey Rybka

Andrew Hood Executive Director of STCU; Zoran Stancic, Chairmen of the Governing Board, Deputy Director General Directorate-General for Ressearch, European Commission; Jean Fournet, Assistant Secretary General for Public Diplomacy; Anton Naumovets, Vice –president of National cademy of Sciences; Andrey Gurjij, Senior Deputy of Minister of Ministry of Education and Science, Victor Alessi; Governing Board Member, President & CEO, United States Industry Coalition, Inc; Yaroslav Yatskiv, Governing Board Member, Academician, National Academy of Sciences of Ukraine spoke on a press-conference, devoted to first in Ukraine such event.

Conduction of the seminar was aimed at reaching two main aims:

- Increasing the level of information of Ukrainian scien-

tists in the questions related to the technology transfer among which the most important are international legislation in the field of intellectual property rights protection, mechanisms of commercialization of the results of scientific research and methods of attraction of funding for scientific research.

- Providing support in the application of the potential of scientists and engineers, formerly engaged in the field of military-industrial complex by means of increasing the commercial attractiveness of their developments, as well as the use of local scientific-research potential of the industry by providing intermediate services in the establishment of relations of local employees with international and Ukrainian industrial enterprises.

193 Ukrainian scientists working on the projects financed by the Science and Technology Center in Ukraine, representatives of 20 Ukrainian industrial and

investment companies and techno parks, as well as 30 companies from the USA, Canada and European Union, took part in the seminar. A number of completed projects were demonstrated in the following directions at the exhibition which took place within the framework of the seminar:

- renewable energy and energy-saving technologies;
- biomedical technology and medical instruments;
- new materials and nanotechnologies;
- nuclear power and safety;
- aerospace industry.

### **One thousand projects**

The STCU is an intergovernmental, non-profit organization created with the goal of aiding unemployed or underemployed scientists in Ukraine, Azerbaijan, Georgia, Moldova, and Uzbekistan who previously worked on the development of weapons of mass destruction for the Soviet Union. The STCU was created and is governed by the 'Agreement to Establish a Science and Technology Center in Ukraine', originally signed by Canada, Sweden, Ukraine and the United States. Subsequently, Sweden was replaced by the European Union; Azerbaijan, Georgia, Moldova, and Uzbekistan have also acceded to the agreement. The STCU finances projects that redirect the know how of the scientists, who were formerly involved in military programs, into peaceful sustainable civilian applications. Other than government funded projects, the STCU also works in a number of other spheres of activity: Matchmaking; Promotional Missions; Seminars and Workshops; Partnership Projects; Travel Grants; and Patent Support.

**During 11 years of its activity Science and Technology Center in Ukraine financed R&D projects with total funding \$150 m**

The STCU Governing Board meets on a semi-annual basis in order to determine the Center's policies and funding for scientific projects. The STCU Secretariat, located in Kyiv, Ukraine, is the main body responsible for fulfilling STCU decisions and policies on a daily basis.

As part of the STCU's Targeted R&D Targeted Initiative Program; originally launched in 2005 by the STCU and the National Academy of Sciences (NASU), with the goal of co-financing, as equal partners, jointly selected projects focused on Ukrainian national S&T priority areas, the Governing Board approved ten (10) Targeted R&D Initiative projects for a total of USD \$354,076 and €111,995.

The Twenty Third Meeting of the Governing Board of the Science and Technology Center in Ukraine (STCU) convened on November 16th, 2006 in Kyiv, Ukraine; approving twenty-eight (28) new regular, government funded scientific projects and extensions for a total of \$687,869.00 and €2,731,390.00 The Governing Board also confirmed Eleven (11) new Partner Projects valued at \$770,822.00 and €345,488.00; and also confirmed were eleven (11) Partner Project contract extensions valued at a total of \$1,552,709 and €30,000.

Within the projects funded was the first project to be funded in the Republic of Moldova as proposed through the new STCU Office in Moldova which has recently been set up and which will be fully operational by the end of the year.

The total funding to date including all twenty-three (23) STCU Governing Boards stands at approximately \$149.8million, with the donor countries contributing the following amounts: Canada - \$3.5m, U.S.A.- \$73.8m, European Union - \$29.0m (€24.3m), Non-Government Partners Sector - \$14.7m, Government Partners Sector - \$27.8m and Other (Japan, CERN) - \$1.0m



## “From Science to Business” – new way forward.

**Kyiv. On 11 and 12 October the Science and Technology Center in Ukraine conducted the international workshop “From Science to Business” in Kyiv.**



Conduction of the workshop was aimed at reaching two main aims:

- Increasing the level of information of Ukrainian scientists in the questions related to the technology transfer among which the most important are international legislation in the field of intellectual property rights protection, mechanisms of commercialization of the results of scientific research and methods of attraction of funding for scientific research.
- Providing support in the application of the potential of scientists and engineers, formerly engaged in the field of military-industrial complex by means of increasing the commercial attractiveness of their developments, as well as the use of local scientific-research potential of the industry by providing intermediate services in the establishment of relations of local employees with international and Ukrainian industrial enterprises.

Conduction of the seminar was aimed at providing knowledge for Ukrainian scientists, which is necessary for collaboration with national and foreign industrial companies, and researches in a sphere of industrial technologies or technology exchange. Workshop makes it

possible to demonstrate already existing technologies.

There were more than 200 representatives, which are connected with technology exchange from governmental, non-governmental, industrial and scientific area and more than 50 national and foreign companies.

STCU cooperates with Ministry of Science and Education of Ukraine to assist former WMD experts in the transition to self-supporting, peaceful activities.

The STCU is an intergovernmental, non-profit organization created with the goal of aiding unemployed or underemployed scientists in Ukraine, Azerbaijan, Georgia, Moldova, and Uzbekistan who previously worked on the development of weapons of mass destruction for the Soviet Union.

The STCU was created and is governed by the 'Agreement to Establish a Science and Technology Center in Ukraine', originally signed by Canada, Sweden, Ukraine and the United States. Subsequently, Sweden was replaced by the European Union; Azerbaijan, Georgia, Moldova, and Uzbekistan have also acceded to the agreement.

Other than government funded projects, the STCU also works in a number of other spheres of activity:

Matchmaking; Promotional Missions; Seminars and Workshops; Partnership Projects; Travel Grants; and Patent Support. From the moment of its foundation in 1993 STCU granted \$ 130 m to research projects with more than 13 000 scientists.

Projects presented at “From Science to Business” workshop

#### ***Environmental and Non-Nuclear Energy Research***

Environmentally friendly technology for municipal solid waste gasification

High pressure hydrogen electrolyzer for auto and industrial application

Piezoelectric valve for real-time and accurate control

Solar array for portable electronic equipment technology

Novel “energetic” materials & laboratory equipment for portable batteries assembling

Low-emission flat-flame burners for industrial furnaces

Facility and technologies of the biogas utilization

#### ***Biotechnologies, Agricultural Sciences and Medicine***

Gold-bearing probiotic drug “okarin-au” for treatment of infectious diseases as anthrax, rabbit-fever and brucellosis

Dynamic cell monitoring using a new fractal microscope system

Cancer autovaccine (CAV) – new specific active antitumor agent

Ultrasonic visualization of visco-elastic properties of soft tissues for diagnostic of pathologies

Super-sensitive magnetocardiographic system for early recognition, precise diagnostics and monitoring of heart diseases

Endoprosthesis with sapphire head for hip joint treatment

Fluorescent probes and labels for biomedical applications

#### ***New materials and nanotechnology***

E-beam production of carbon-based materials with amorphous, nano-structures for industry and medicine

Diamond polycrystal nano-composites for industry

New filmcoating for opto-electronics

Atomically smooth metal surfaces

Oxide nano-powders for advanced medical and industrial application

Nano-ceramic composites for wear-resistive applications

Superconducting nano-materials for cryogen electrical machines

#### ***Nuclear energy and safety***

Borehole siting technique for geological repositories of radioactive waste

Neutron source for neutron capture therapy of cancer tissues at Kyiv research reactor (KRR)

Neutron filtered beam technique at the Kyiv research reactor

Neutron tubes HTF-26 HTF-3

Semiconductor detectors for nuclear radiation spectrometry

Tritium static eliminators (TSET)

Tritium-containing targets for neutron generators

#### ***Aerospace***

Advanced one-stage EB-PVD coating for aerospace and gas-turbine applications

Nanosatellite for electromagnetic measurements

Unmanned transport reusable airborne-space vehicle

Filtered vacuum-ARC plasma source for high quality coating

Micromodules for low-power thermoelectric generators with radioisotope heat source for interplanetary space equipment

Advanced materials and structures for long-term space operations

Space environment simulator

<http://ukrsmb.info/vir-u.htm>

## With a Sapphire Pair in Life

*Even in a hospital, Mariya Vasilyevna contrives to look attractive in her color dressing gown and with a smile on a kind face. She has undergone a unique operation, during which a hip joint, affected by arthritis, was changed into a sapphire endoprosthesis. The patient knew beforehand that a half-precious stone would be working in her organism and did not hesitate in the success of operation – she completely trusted her surgeon Vladimir Akimovich Filippenko. A perspective to lose mobility frightened her much more.*



*Valentya Gatash*

The attempts to change natural joints affected by illness into the artificial ones were undertaken by surgeons already at the end of the 19th century, but artificial limbs that function more or less normally began to appear only in the fifties of the last century. For instance, a native of Ukraine Konstantin Mitrofanovich Sivash, who had both medical and technical education, working in Moscow, for the first time in the USSR created “Sivash artificial limb”, which is still being clinically used. The pioneer abroad was Professor Charnly, who was the first to use artificial limbs with the so-called cement fixation.

But in the course of time, a considerable shortcoming of these in general good constructions appeared – deterioration of the pair of friction, that is, the metal head of the artificial limb and ethylene homopolymer acetabular socket, which embraces it. As a result of deterioration, small parts of these materials were accumulating in the tissue that surrounds endoprosthesis, which led to the violation of function of the artificial limb, feelings of pain and the necessity of repeated operations.

And although the pair of friction “metal – ethylene homopolymer” even now is considered to be “the gold standard” for prosthetics, this shortcoming forces scientists to look for a substitute of these materials. A “metal-metal” variant has been researched – unfortunately, deterioration in this case also takes place, besides, metal is not able to amortize loads. In the pair “ceramics – ceramics” friction practically approaches zero, but there is a considerable defect – the fragility of this material leads to the break of the head or sock-

et. Besides due to the polycrystalline structure of ceramics one cannot achieve the ideal sphere in the joint.

Monocrystal of sapphire as a working material for the creation of endoprosthesis has a whole number of advantages – it is inert, biocompatible with living tissues and does not worsen the immune state of organism. Well polished sapphire surfaces do not splice with osteal structures, organic molecules do not accumulate on them. The coefficient of friction and the coefficient of deterioration of sapphire pairs approach to the corresponding values for a natural limb.

All these considerations served as a foundation for cooperation of specialists of the M. Sitenko Institute of Pathology of Spine and Joints of the Academy of Medical Sciences of Ukraine, the National Technical Company “Institute of Monocrystals” of the National Academy of Sciences of Ukraine and the Institute of Extra-Hard Materials of the National Academy of Sciences of Ukraine. The investigations were carried out within the framework of the state scientific-technical program, and were also supported by a project of the Science and Technology Center in Ukraine. As a result of team-work they managed to create at first a sapphire head, which the Kharkivites have been using for years, and now a complete sapphire pair of friction – the head and the corresponding socket. — How can you explain, that it were precisely the Kharkivites who became pioneers in this field of orthopedics? – I ask the Head of the Department of Pathology of Joints of the Institute of Pathology of Spine and Joints of the Academy of Medical Sciences of Ukraine, Professor V. Filippenko.

— We were lucky – Kharkiv has the only institute in our country where one can create artificial sapphires of a rather big size,- told Vladimir Akimovich. The specialists of STC “Institute of Monocrystals” possess also the technologies that let elaborate the sapphire heads till the parameters which are necessary for bringing the sphere to the ideal state. I'd like to note that such technologies exist also in the United States and Japan, but due to different reasons the value of the sapphire, which is made there, is considerably higher. That is why the use of monocrystals in orthopedics was admitted in those countries as a non-perspective, and, correspondingly, these trends of medicine have not been developed there. In our country the sapphire does not become expensive – the worth of sapphire head in the price equivalent approaches the worth of the same head made from metal. Economic expediency here is obvious.

— Can you say that a sapphire endoprosthesis is eternal?

— The very sapphire pair is really eternal, but there is not a single medical construction in general, that would correctly function in a person all his life. Different biophysical and biochemical processes take place in the organism, which in our case lead to interaction of the artificial limb's leg, cement cloak which surrounds it, and osteal tissue. Cement, for instance, grows old, and because of that the construction becomes “loose”, unstable. A sapphire artificial limb should work rather long – 15-20, even 25 years but then, it seems, it has to be replaced as well.

— Can you say that diseases of the joints are typical mainly for women?

— For elderly women. And for young men who suffer from aseptic necrosis.

— How much will a sapphire artificial joint and the very operation cost for a patient?

— Operations in our country are carried out free of charge, at the expense of the state. As far as the artificial limb is concerned, theoretically it will cost no more that a present-day standard construction. The price of a standard foreign construction is about one thousand dollars. A domestic, Dnipropetrovsk-made one – about 600 dollars

— Are these individual articles?

— In the case with Mariya Vasilievna – yes, because it is still a single operation. Here are cases when we make individual artificial limbs after medical evidence, for instance, after ablation of tumors that destroy osteal tissue in every patient in its own way. We have corresponding production. There are foreign module artificial limbs, their size can be changed in the course of an operation. But both for us and for a patient a domestic individual artificial limb is cheaper than a foreign module one. And in the majority of cases standard artificial limbs of different size and modules are applied.

— And how many patients do need such an operation?

— Five thousand people a year. In fact, about two and a half thousand operations are being carried out during a year – that is, only a half of those who need help receive it. And if to judge according to the criteria which are used in the European countries and the United States, then a number of people who need this operation is several times higher. The matter is that in our country a person

comes to orthopedist when he is feeling a strong pain and cannot walk, that is, as it is called, there is no place to hide. And in the developed countries of the west the criterion is different – quality of life. For instance, a damaged leg hinders a man to get into a car – he comes to the conclusion that he has to be operated, and doctors support him in this. If to use such a criterion, then we have to make at least 15 thousand operations a year. But in fact we are not able to help even those 5 thousand who are in the critical need of it.

-- Do you lack artificial limbs?

--The lack of artificial limbs is only one of the components of the problem. We asked regional specialists-orthopedists a question – “How many artificial limbs do you need?” Only 500 were added to 2,5 thousand. The thing is that our entire infrastructure is not ready yet for the increase of volumes of surgical help – operating rooms should be provided with necessary equipment, personnel should be trained, we should have a rehabilitation system and so forth. All this costs rather expensive. That is why till we settle the questions with finding of the public health, we do not have any perspectives in this aspect. And they can be solved only in the presence of insurance medicine. Still, we must be ready to operate all people in need as soon as such a possibility appears. That is why we prepare specialists at our Institute, and in other cities, where only profile hospitals exist, permanently working courses have been working.

— Under some diseases, several joints suffer simultaneously. How many artificial limbs can be installed simultaneously to a patient?

— Quite often a patient can have two and more artificial limbs. For instance, we admitted a patient who already has two hip joints, now we will install her a knee joint. The history of orthopedics has had a unique case. A woman suffering from polyarthritis has been operated and nearly all joints have been changed – two hip joints, two knee joints, two ankle joints, two shoulder joints, two elbow joints, four on fingers and a wrist joint.

— How quickly does a person recover from an operation?

— In the times of Sivash a plaster was put for three month after an operation. Now an operation lasts for two-three hours, a patient can get up at the second day already and walk on crutches during these three months. At the end of this term we allow to load a leg to the full, including, for instance, running and jumping.

It should be added that the criterion existing in western countries – the quality of life – has led to the fact that a half of operated patients is under fifty. Many lead an active way of life, for instance swim and play big tennis, although the truth is that under an intensive burden the deterioration of the artificial joint begins earlier, for instance, a pair “metal- ethylene homopolymer” wears in five-six years. There are many examples of celebrities with endoprosthesis, including men of politics, sportsmen, actors, and etcetera. This is a rather widespread operation – over a million of such operations is made in the world, half of them – in the United States.



# НАУКА ТА ІННОВАЦІЇ

## Science and Innovations

# 4, 2006.

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SCIENCE AND TECHNOLOGY  
 CENTER IN UKRAINE (STCU)  
 INFORMS:



## TARGETED RESEARCH & DEVELOPMENT INITIATIVES



**Landis Henry**  
*Deputy Executive Director*



The reorganization of the STCU in June 2004 and the resulting new priorities for action made it increasingly important for the Centre to rethink and expand its range of activities. An outcome of the reorganization was the establishment of the Targeted Research & Development Initiatives (TRDI). The assumption was that the greatest progress is likely to come from targeting specific areas of need (or scientific opportunity) that could benefit from the concerted efforts of key stakeholders in the context of targeted Ukrainian priorities.

In attempting to implement this initiative, it was important to build effective partnerships and alliances within and outside Ukraine. Thus, our goal was to establish a nationwide programme that would integrate STCU's non-proliferation objectives with Ukraine's science & technology priorities. Moreover, to use the new programme as a mechanism of bringing the Recipient Parties to the table as active partners in financing research of national priorities.

In such an approach, we engaged stakeholders, in dialogue, in order to establish research areas of distinctive competence within Ukraine. We intend to facilitate development of self-sustainability and research excellence in the applied science and technology development fields. Scientific areas that provide for the possibility of sustainability of technical teams / institutes. In this context sustainability is defined as the ability to attract research and developmental funding from multiple sources as well as the ability to move technology development along the continuum "idea" to "final product", hopefully attracting private sector funding. In implementing the initiative, our activities were guided by the STCU's mandate of engaging scientists that were involved in developing weapons of mass destruction (nuclear, chemical, Biological), during the Soviet era.



Through consultation and engagement of key stakeholders (scientists, government, industry, institutes, Academies etc.), five priority areas were established. It is noteworthy that the areas: nanotechnology / nano-materials; biotechnology; environmental technology; information technology and industrial scale safety and alternative energy technologies are reflected in Ukraine's scientific areas of National priorities.

Next, a priority was placed upon establishing an effective partnership with the National Academy of Science (NASU) and other Ukraine government departments (e.g. Environment) that are important components of the innovation network. The partnership with the NASU had the following characteristics and laid the basis of a pilot TRDI programme in 2005.

- Dependency** STCU and NASU shared risk / responsibility / resources / competencies, during the pilot period (2005).
- **Synergy** – value added ( $1 + 1 = 3$ ), both sides were not simply co-financing the initiative.
- Commitment** A formal agreement on the partnership was signed in June 2005.

- **Work Together** – the agreement was expected to and did allow the partners to work together from design & governance of the initiative through implementation and evaluation.

**Trust based relationship** It was necessary to have a mechanism whereby the partners were able to learn from each other as all stakeholders hoped for a continuation of the programme beyond 2005.

The success of the relationship between the STCU and the NASU is reflected in the historic Agreement that was signed in June 2005. In the Agreement, both sides agreed to equally co-fund research projects (total funding \$1.0 million) within the Targeted technology areas. It is noteworthy that STCU provided additional support for the TRDI with training, travel support, workshops etc.

Whereas "Regular" and "Partner" STCU projects engage FWS, it was quickly realised that these programmes are limited in scope when attempting to enhance innovation in the context of sustainability. As such we introduced the following changes;



All successful grant applications had to be co-funded by the Financing Parties (STCU & NASU).

- Establish a National program emphasising inter-departmental and inter-institutional linkages.

Establish a mechanism to provide constructive feedback from reviewers which was conveyed to the technical teams.

- Reduce the time required from project submission to funding decision. In TRDI, the total time from submission of research proposals to funding decision is less than 6 months as compared to more than one (1) year for Regular STCU projects.

- Focus research within the Targeted areas by organizing technology workshops and technology missions (to and from Ukraine).

Provide training in key areas, including grant writing, industrial partnering, intellectual property protection and commercialization.

Provide possibility for technical teams participating on the TRDI to obtain needed competitive intelligence during the project implementation phase. This possibility was provided through an Agreement involving

Kiev Polytechnic Institute, University of Lyon and STCU.

Projects not funded under the TRDI could be resubmitted to STCU for consideration as "Regular" STCU projects.

During the inaugural year, the STCU and NASU issued a joint call for proposals in February 2005, in all 5 targeted areas. Technical teams were given two weeks to submit a "short form" application to the NASU outlining the proposed project. A total of 62 applications were submitted. Of these, 28 technical teams were requested to submit full research proposals (to the NASU) under the guidelines for the new program. A total of 14 "full form" proposals were transmitted to the STCU for Western review and 7 were selected for funding through the TRDI. Three (3) of the remaining projects received funding through STCU's "Regular" programme funding.

At the December 2005 Governor's Board Meeting, of the STCU, the Western Funding Parties and the NASU reviewed the TRDI and were in agreement that the programme had been a success and agreed to continue the initiative, with some changes, into 2006.



### ***Positive Outcomes of the TRDI in 2005***

- TRDI was shown to positively impact the innovation process within Ukraine.
- Ukrainian scientists appreciated the constructive feedback from Western technical reviewers.  
The review process strengthened the technical quality of the research projects. TRDI was shown to be an effective vehicle linking Ukrainian scientists to their Western counterparts and provided enhanced mechanism of finding collaborators.
- The holistic approach taken by TRDI addressed important issues that are linked to sustainability of technical teams and research institutions.
- The activities of TRDI are consistent with the mission / policies of the STCU with respect to the redirection of former weapon TRDI is consistent with Ukraine's National priorities.
- TRDI has solicited real funding from the Ukrainian government and a commitment to work with the STCU in funding research and technology development.

- TRDI provides a mechanism whereby STCU Senior Specialists are able to provide value-added input to project managers. TRDI provides a mechanism for engaging different ministries within STCU Recipient States.
- TRDI provides mechanism to focus research in Recipient States in ways that are consistent with sustainability.

### ***Negative Aspects***

- Need to avoid sending project proposals to Western reviewers during the summer months. Call for proposals must be initiated in November/December with the funding decision taken at the June STCU's Governors Board Meeting of the following year. Scientists must be cognisant of the need to find scientific collaborators in the "Donor States".
- In any given year focus on a limited number of technical areas.  
Work with NASU to ensure that project proposals submitted to STCU are not totally Kiev centred but reflective of science across Ukraine.

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### ***Targeted Research & Development Initiatives 2006***

Using the lessons learned in 2005, a new call for proposals was issued in February 2006. The number of technical areas was reduced from 5 to 3 (nanotechnology / nanomaterials, information technology and industrial safety / alternative energies technologies). A total of 78 "short forms" were submitted to the NASU and of these a total of 22 "full form" proposals were submitted to the STCU and subsequently the Funding Parties for review at the end of May 2006. At a meeting in Kiev in May 2006, the Funding Parties (Ukraine, Canada, European Union and USA) agreed to undertake simultaneous review of the proposals with final funding decision to be taken in October 2006 at a joint meeting of all the Funding Parties. It was also decided that Ukraine plus at least of the other Funding Parties must co-fund any given proposal. Furthermore, funding from the Parties could be used for any of the activities within a given project (i.e. Western funding was not restricted to salaries).

#### ***Expanding the TRDI***

**Georgia** – In 2006, the STCU has continued to work with the Georgian National Science Foundation (GNSF) regarding the establishment of a TRDI. Discussions were initiated in 2005. Currently the statement of cooperation and the provisions of the agreement have been drafted. The priority areas have been established and the GNSF has committed a budget to the new programme. An important difference between the existing STCU / NASU agreement and the proposed STCU / GNSF agreements is that in the latter, the Georgian funding would be transferred to the STCU and a single project agreement would ensue.

#### **Ukrainian Ministry of Environmental Protection**

– In an attempt to establish research priorities for environmental sciences in Ukraine (one of the targeted priority areas), the STCU in partnership with the NASU and the environmental association "Ecomet" organised a workshop in Lesnoy (Dnepropetrovsk region) in September 2005. The workshop (invitation only) brought together leading scientists, senior governmental officials, senior industrial managers (representatives from 27 of the largest and most important companies from 13 cities within Ukraine's industrial heartland). In addition to establishing research priorities, the workshop was effective in establishing effective linkages with key stakeholders. It also led to the STCU engaging the Ministry of Environmental Protection in discussions regarding the establishment of a TRDI. Both sides are now working on the provisions of an agreement focusing on environmental priorities.

#### **Engagement of Biological Institutions**

In June 2006, the STCU in partnership with the Mechnikov Anti-Plague Research Institute in Odessa and Ecomet" organised a workshop focusing on biological research and manufacturing institutions. The goal of the workshop was to promote and position the institutes to undertake contract services for foreign organizations in order to attract needed financing for project funding and facility upgrades. This initiative is consistent with the goals of the TRDI.

In conclusion the new Targeted Research & Development Initiatives was effective in;

- Successfully engaging two of the STCU Recipient States to work with the Centre in building a stronger more coherent innovation infrastructure whilst engaging FWS
- Strengthen organizations engaged in development of knowledge / expertise that underlie a knowledge based economy

- 
- Using existing mechanisms to attract Ukraine political & financial support in redirecting FWS into Ukraine long-term science and technology development programs  
It is the first time a Recipient Party participated as equal partner with STCU in redirecting the activities of FWS
  - Demonstrate tangible benefits of a holistic approach in areas of science excellence and sustainability

- Focused research to the areas identified as being of distinctive competence & National priorities  
Providing training in key areas
- Organized in-coming & out-going technology missions to facilitate technology development & commercialization

Currently the TRDI is the only mechanism we have for bringing the Recipient Parties in as active and equal partners. It is a new way of doing business and is expected to grow in the coming years.



27, October, 2006.

# Parity priorities

*Valentyyna Gatash*

“Targeted R&D Initiatives” is a name of program of the Science and Technology Center in Ukraine (STCU) and National Academy of Sciences of Ukraine, which was jointly financed by the STCU and NASU (each party committed US \$500,000) in 2005. It is the first time that STCU and Receptient Party joined in an equal, cooperative partnership to competitively select and jointly finance projects focused on national priorities. It's one of the largest (in terms of financing) collaborative science partnerships in Ukraine.

One million dollars was directed on to 7 research projects in the areas of environmental research, IT and material science. Of the seven winning proposals, the largest number three and largest funding total (over US\$340,000) were environmental technology projects. These projects were: a project for monitoring and modeling atmospheric ozone concentrations over Ukraine using standard European Environmental Agency methods; a project to develop rapid and inexpensive methods of perchlorate detection for field-monitoring ground and surface waters; and a project to develop a pyrometallurgical technology for recycling oxidized wastes containing nickel and chromiu.

Success of the Target Initiative Program attracted other organizations to the STCU activities, such as Ministry of Education and Science, Ministry of Environment Protection of Ukraine, NSAU (National Space Agency of Ukraine). In addition to this interest in Targeted Initiatives, STCU has cooperated in other activities. In the beginning of this year, STCU joined with the Ministry of Education and Science and the National Space Agency of Ukraine in sponsoring the International Symposium “Forecasting Scientific, Technological and Innovational Development: the Ukrainian State Program and International Experience”.

At the last STCU Board of Governors meeting in May, over US \$ 7 million in Partner Projects were approved, one of the largest amounts in STCU history and a large increase in the partner funding compared to 2005. In my opinion the partner projects are very important to make first steps in the long-term cooperation with government programs and commercial investors.

In 2005 the large-scale partner project “Renewal Welding and Brazing of the Jet Engines Components and Gas Turbines and Blades” implemented by the Y.O. Paton Electric Welding Institute was completed, US Department of Energy funded one million 260 thousand dollars. Has this development been applied to practice?

Yes, the technology is used by joint Ukrainian- American enterprise “Pratt & Whitney-Paton” and it performs the orders of aerospace and turbine industry of Ukraine. In a near future the enterprise plans to perform international orders, using this technology. I must admit that this project is important not only from the commercialization's point of view but also that new directions of cooperation in the aerospace materials area between Ukraine and USA have been created.

The STCU Executive Director Andrew Hood said that now it os possible to see that Ukraine want to be a part of the World Community. Now Ukrainian scientists are better informed about situation in the world science and they collaborate with foreign colleagues more actively.

[http://www.poisknews.ru/2006/10/27/paritetnye\\_prioritety.html](http://www.poisknews.ru/2006/10/27/paritetnye_prioritety.html)



#43, October, 2006.

# Ukraine is integrating in to the world scientific community

*Science and technology center in Ukraine (STCU) has been working in Ukraine more than 10 years, supporting the transition of WMD research into peaceful civilian application. Due to financial support of the Center former WMD scientists from Ukraine, Georgia, Azerbaijan, Uzbekistan and Moldova have possibility to take part in peaceful R&D projects, scientific conferences, to collaborate with scientists from different countries, to promote their technologies to the world market. STCU has more than 120 partner-organizations from the donor-countries. We're talking with the STCU ED Mr. Hood about the recent achievements of the Center.*

Valentya Gatash

## **Mr. Hood, what is the most significant achievement of the Center in 2005?**

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## **What other governmental and public organizations cooperate with the STCU?**

Success of the Target Initiative Program attracted other organizations to the STCU activities, such as Ministry of Education and Science, Ministry of Environment

Protection of Ukraine, NSAU (National Space Agency of Ukraine). In addition to this interest in Targeted Initiatives, STCU has cooperated in other activities. In the beginning of this year, STCU joined with the Ministry of Education and Science and the National Space Agency of Ukraine in sponsoring the International Symposium "Forecasting Scientific, Technological and Innovational Development: the Ukrainian State Program and International Experience". Also STCU is looking forward to assisting the U.S. Department of Health in developing new partner projects with Ukrainian scientists, so that cooperative research in the areas of health and biology can occur.

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This project just started, called the Chief Technology Commercialization Officer or CTCO. In this project, STCU will assist in the training of technology transfer officers to be established in 13 Institutes of Kyiv, Lviv and Kharkiv. We're planning to engage more Institutes in this initiative in the future. But the project just started and it's too early talking about results.

***Off-budget sources for financing the scientific research are commonly accepted world practice. What is the dynamics of attracting private investors for implementing partner STCU projects?***

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Another significant project in this area is Project, financed by the European Office of Research and Development of the U.S. Air Force. The project will examine the optical properties of a relatively new crystal material, the performers of the project will be scientists of the Institute of Solid State Physics (Uzhgorod, Ukraine) and of the Institute of Physics (Kyiv). This project will bring improved crystal growth technology to ensure better photorefractive properties, important for a broad array of optical and near-infrared laser applications.

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But most probably, thermonuclear fusion energy could be available to the humankind in many-many years so international community need to pay attention to another ways of research and receiving another energy sources. Thought wind and solar energy can't yet completely compete with the gas and nuclear energy, Ukraine has opportunity to develop the mixed sources of energy for its national energy needs. For example STCU has had a couple of projects in the area of developing wind generators, including a recently started project on low wind speed power generation with scientists from the Yuzhnoye SDO, Frantsevich Institute of Problems of Material Sciences and a Georgian Mining Institute in Tbilisi.

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in other countries there is such problem also – for example, because the USA has not built new nuclear power plants in many years, the nuclear science field has not attracted many younger scientists during those years, so the U.S. scientific knowledge base has grown older because of this situation. I do not think that many young scientists work in aerospace – my education is aerospace engineering and I know the situation. Interest of young scientists is driven by the interests and needs of the market. For example, young scientists work in IT, genetic engineering, in the same time some fields of science can get older and even disappear. I think there is a need to create a strategy of attracting and keeping young people in a wider variety of science fields.

***Mr. Hood, thank you very much for the support of all-Ukrainian competition of popular scientific articles and photo "Galiley". As executive director of STCU you have supported the competition from its organization. Its founders also trying to attract the young people to participate. With this purpose we initiated a new nomination - science fiction story, with a scientific idea in a base.***

It's very interesting nomination. We all know that new ideas and fantastic technologies we read in books some years ago became true now. Interest to science and technics, desire to work in this area could be initiated by different ways, including imagination and fantasy.

**<http://www.vtg.lg.ua/index.php?year=2006&id=287>**

МІЖНАРОДНИЙ СУСПІЛЬНО-ПОЛІТИЧНИЙ ТИЖНЕВИК

# ДЗЕРКАЛО ТИЖНЯ

# 40 (619) Saturday, 21 - 27 October, 2006

## There is a proverb: "Nastya could cook but could not serve", translating to English it means "From Science to Business"

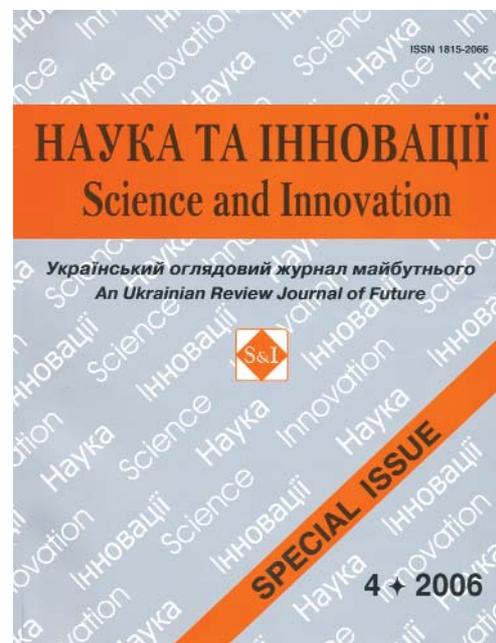
Alexander Rojen

Mr. Gurgiy is oratory person, who can propose a good toast to somebody. May be this proverb about Nastya about the situation with Ukrainian science was defined correctly, as if it exists, this proverb was said at the workshop in the Teacher's House. If it exists, then where are people which want to use its innovation benefits? Since researchers of soviet school have become independent it is impossible to find answer on this question.

Writer Sholohov created beautiful character of blind horse, which all its life went round and turned wheel, which provide water to gutter. When people untied it, the horse continued went round. There is the same situation with our science, which was described by senior deputy of Ministry from Ministry of Education and Science. It appeared that our researchers do not have knowledge about PR, management and business-plan. All these are attributes of modern science in society. Moreover, our scientists are dumb, because most of them can not speak English.

Colleagues from scientific community are ready to help scientist. Their meeting gave disputable results. Recently there was a workshop with promising title "From Science to Business" organized by Science & Technology Center in Ukraine (STCU) and North Atlantic Treaty Organization (NATO) in the Teacher's House . Usually people that are researches do not show enthusiasm to such events. Generally such workshops gather people which want to obtain grants and spread them between colleagues. Moreover, it is not everything clear with Western money distribution. Our scientists had claims to STCU.

Old function of this organization die out, this function was to occupy scientists in order to draw away them from weapon of mass destruction development. The organization has aim to rearrange its work in order that researches work will help to business, in other words work on our economy. STCU management is open and ready for acquaintance of Ukrainian community with results of its work. Probably that is why at the hall of the Teacher's House there was an exhibition of Ukrainian



scientists' achievements, which collaborate with this organization. There were demonstrated different developments: renewable energy and energy saving technologies, biomedical technologies and medical equipment.

A bit earlier special issue of Ukrainian magazine "Science and Innovations" was dedicated to future workshop and works that will be presented there. The issue was really successful and this is merit of academician Yatskiv. The main thing for scientists was the translation of their articles on the language of world science community. Their possibilities and business prospects of each research were clear formulated. Generally rare product was created for our science. It will be very helpful for Ukrainian scientists and pave the way for business. Ukrainian science would not be in the same situation with Nastya, may be if National Academy of Sciences of Ukraine and Ministry of Education and Science had done the same earlier.

<http://www.zerkalo-nedeli.com/ie/show/619/54812/>

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# ДЗЕРКАЛО ТИЖНЯ

# 33 (612) Saturday, 2 - 8 September, 2006

## Million Dollars on financing of joint projects

Valentyna Gatash

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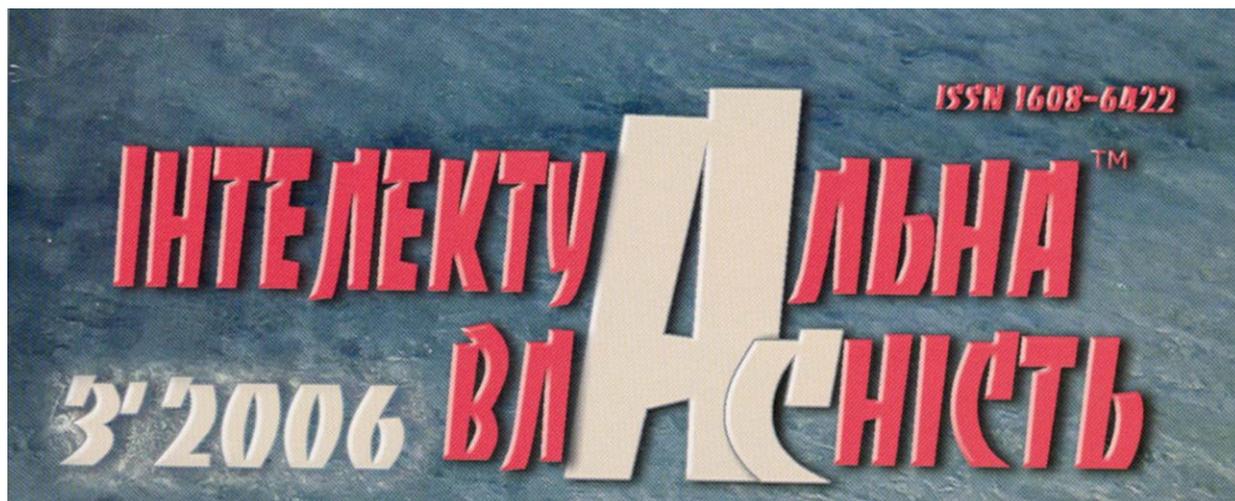
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It's very interesting nomination. We all know that new ideas and fantastic technologies we read in books some years ago became true now. Interest to science and technics, desire to work in this area could be initiated by different ways, including imagination and fantasy.

***Are you ready to award the winner of that nomination?***

It's interesting idea. I'll think about it!

<http://www.zerkalo-nedeli.com/ie/show/612/54349/>



INTELEKTUALNA VLASNIST #03' 2006  
 (INTELLECTUAL PROPERTY)  
 FACTS AND EVENTS

## STCU changes priorities

On March 14, a seminar called "Strategy of Intellectual Property Management: Building a Business on Your Ideas" was held by the Science and Technology Center in Ukraine for representatives of domestic research institutions.

According to Borys Atamanenko, Senior Deputy Executive Director of the Center, the STCU's program is currently in the stage of transformation. "In the beginning, ten years ago, it was direct financing of certain projects in certain institutes, in order that the Western countries — the USA, Canada and the European Union — could have access to the institutes". Today, the Center aims at providing the scientists with the opportunity to look for sources of financing by themselves, including abroad.

The seminar was held within the framework of the Center's training programs promoting self-sufficiency of scientists. During the seminar, patent attorneys told the managers and patent specialists of several dozens of research organizations of Ukraine about the purpose of patenting, its advantages and risks. A representative of Ukrpatent informed those present about the current legislation and draft laws in that field. The STCU specialists introduced the participants of the seminar to the programs and terms of cooperation with the Center.

Oleksandr Slobodyanyuk, a patent attorney, tried to get across to the representatives of research institutions a message describing patent ownership is an instrument for making money: "Patenting of the results of developments and their subsequent use can be an integral part of the general business strategy". According to him, a Ukrainian patent provides the monopoly of use of the results of developments in Ukraine and prevents any third persons abroad from obtaining the monopoly of such use. Furthermore, filing of an application for

Ukrainian patent is a kind of deposit protecting inventors from possible unauthorized disclosure of the information regarding the substance of the invention. O. Slobodyanyuk went on to say: "At the same time, after obtaining a Ukrainian patent, there is no way one can obtain a similar patent in other countries (unless an international application under the PCT system is filed in good time).

Sergiy Petrenko, who represented the Kyiv enterprise "Lileya", told the audience about his first license agreement for his invention made with the STCU's support. The inventor expects to receive royalties at the rate of 8.5% of the amount of license agreements concluded by the owner of patent rights on the territory of the USA — the U.S. Department of Energy. The development of "Lileya" — a nanomechanotronic manipulator — enables control of substance at the molecular level. (A detailed description of the device and the work that was done to commercialize S. Petrenko's development was provided by the "IP" in its issue #10, 2004). Thanks to the STCU's grant, the "Lileya" inventors were able to patent their development in Ukraine, as well as to file an application and obtain a patent in the USA. The first such agreement has been already signed: a U.S. company expressed the wish to use the invention in the field of medicine, electronics and optics.

B. Atamanenko said: "This is a result we are very proud of, and we hope that all of the projects will have the same opportunity. And the STCU will be used as an instrument for achieving results such as this one".

***The presentations made by the speakers are available on the STCU's web site ([www.stcu.int](http://www.stcu.int))***



# НАУКА ТА ІННОВАЦІЇ

## Science and Innovations

# 2, 2006.

SCIENCE AND INNOVATION. 2006. T 2. № 2. C. 96–101.

### SCIENCE AND TECHNOLOGY CENTER IN UKRAINE (STCU) INFORMS:



*Science and Technology Center in Ukraine (STCU) is intergovernmental organization dedicated to the nonproliferation of weapons of mass destruction expertise. The STCU was established under an intergovernmental agreement in 1993, and began operations in 1995. Since then, governmental programs and private sector agencies from Canada, the European Union and the United State have used the STCU to manage nearly 950 R&D projects, worth over US \$135 million.*



### WHO ARE WE?



The Science and Technology Center in Ukraine (STCU) is an intergovernmental, nonprofit organization supported by governments of Canada, the European Union, the United States, and Ukraine with the goal of aiding underemployed scientists previously working on the development of weapons of mass destruction for the Soviet Union. The STCU mission is to assist these former military scientists, technicians, and their institutes in redirecting their S&T talents toward peaceful, successful, self-sustaining civilian research employment. By this transition, the STCU seeks to accomplish its WMD non-proliferation mission, contribute to national, regional, and global security, while at the same time supporting the integration of these former military scientists and institutes into their domestic economies and into the international science and commercial technology communities. The STCU provides tax-free grants for cooperative science research and technology development projects, as well as provides supplemental support activities. Because the STCU is a multilateral organization, it operates with diplomatic status, using international financial and procurement standards, and providing professional management and oversight of its activities. Thus, STCU attempts to promote national, regional and global security.





Meeting with representatives from Founder Countries of STCU



STCU Governing Board Meeting

## SCIENCE AND TECHNOLOGY WORK

For over 10 years, the Science and Technology Center in Ukraine (STCU) has worked to assist former weapon scientists and institutes in Ukraine and in other Beneficiary countries (Azerbaijan, Georgia, Moldova, Uzbekistan) to redirect their talents toward peaceful, self-supporting research employment. STCU project activity has taken place in the following disciplines: nuclear Energy & Safety, Environmental & Energy Conservation Biotechnology, Agriculture, and Medicine, Chemistry, Physics, Sensors, Aerospace & Aeronautics, Industrial and Communications Technologies, Material Science.

As former military scientists attract more research work from commercial customers or from national/international research programs, their future in long-term, non-weapons S&T employment becomes more secure. Therefore, enabling former weapon scientists and institutes to benefit fully from their research and development work helps the STCU to accomplish its non-proliferation mission as well as contributes to national economic and technological growth.

This is why the STCU and its Governing Parties (Canada, the European Union, Ukraine,

and the United States of America) are placing more emphasis on selecting projects and other activities that help former weapon scientists and institute build strong, successful, and self-sustaining avenues of civilian research employment.

## REGULAR SCIENCE STCU PROJECTS

Regular Projects are selected for funding by by the STCU Financing (Canada, EU, United States) after the project is evaluated by experts and considered valuable for funding based on multiple considerations e.g., technical merit, contribution to WMD nonproliferation aims, policy priorities, potential for integration of scientists into global science community, commercial potential, etc. Regular Project proposals compete on an equal basis for project financing, are are selected during the semiannual STCU Governing Board meetings.

The STCU accomplishes its mission in two ways. First, the STCU seeks to integrate former weapon scientists into the global science community through collaborative research projects with scientists from Europe and North America. Second, the STCU manages several programs to help former weapons scientists and institutes develop skills, capabilities, and presentation



**STCU Governing Board Meeting**



opportunities that will attract other sources of research funding, independent of the STCU. By having a well-deserved reputation in the global S&T community and a diverse set of research income sources, scientists and institutes from Ukraine and the other Beneficiary countries can sustain their level of research, improve the quality of that research, and establish a sustainable, long-term position within the global commercial and S&T communities.

The STCU is proud of its financial and technical support to over 930 science projects since 1995 (the majority of which involve Ukrainian scientists) which have built professional connections to scientists and institutions of Europe, Canada, and the United States. These projects have helped to sustain the scientific base of Ukraine and the other STCU Beneficiary Parties. With over \$134 million USD invested in these 930 STCU projects, there is a great potential for these projects to be used by national and local government agencies, ministries, and commercial businesses both inside and outside Ukraine and the other Beneficiary Parties. STCU project results often represent the "proof of concept" stage of development, and the STCU can bring in western expertise to help Ukrainian and other beneficiary scientists advance their results further across the continuum of technology development.

Any STCU recipient country organization (institute, university, state enterprise, design office, or other legally registered entity) may submit an STCU project proposal, however each project team must have a minimally acceptable number of former weapon scientists on it. Several organizations, in one or more STCU recipient countries, may submit a 'joint proposal.' Project teams, led by a project manager or by project managers, develop proposals for submittal to the STCU for funding. All grant recipients must be citizens of an STCU recipient country. Young scientists may participate, they can even form and lead their own teams, so

long as the resultant project team meets STCU guidelines on minimum numbers of former weapon scientists on the project team.

### **PARTNER SCIENCE STCU PROJECTS**

Partner Projects differ from the previous type, because they are funded from the budgets of governmental agencies, nongovernmental organizations, or private companies and institutes that are approved as "Partners" to the STCU by the STCU Governing Parties.

Scientists and institutes enter into STCU Partner Project agreements with those STCU Partners, which provide their own financing to the project through STCU's administrative management structure. Over 120 organizations and companies, such as U.S. Department of Energy, Max Plank Institute, Lawrence Livermore National Laboratory (USA), Michelin, Chalk River Laboratories (Canada), DuPont Company, and General Electric Corporation have financed STCU Partner Projects to meet their specific research needs or objectives. Because of STCU's knowledge of the research capabilities of the former weapon scientists and institutes in Ukraine and elsewhere, STCU can connect Ukrainian and other Beneficiary scientists to individual governmental programs and private sector customers that have specific research needs and funding to fulfill those needs.

The STCU Partners Program began in 1997, and has attracted over \$35 million USD in funding from European and North American commercial companies, academic institutions, and governmental research programs. These customer-specific projects and activities are critical to advertising the science research potential of Ukrainian and other Beneficiary Party scientists and to building successful and beneficial long-term relationships that establish positive technology transfer channels to a larger customer base.

### **BECOMING A PARTNER**

The STCU's Research Partnership Program is recognized as a convenient and reliable means by which to meet members of the scientific business community of the former Military Industrial Complexes of Azerbaijan, Georgia, Moldova, Ukraine, and Uzbekistan, as well as a tool to minimize costs while obtaining hitech R&D results. The more than 120 organizations from various STCU Donor Countries who have become STCU Partners, trust the STCU to deliver worldclass services, and gain breakthrough results from their Partnership projects thanks to the work of toplevel scientists from the newly independent states. Since the establishment of the Partnership Program in 1997, STCU Partners have contributed over US \$34 million and received a total R&D return valued at approximately 10 times their initial investments.

Private companies, industry organizations, government agencies and programs from Canada, European Union, and the USA can apply for Partner Status. You may find a sample letter for applying for STCU Partner at the STCU website following link:  
<http://www.stcu.int/offer/commercialcontr-res/index.php>

### **NONGOVERNMENTAL PARTNERSHIPS PROGRAM (NGP)**

In the year 2005, sixteen new partners have joint NonGovernmental Partnerships (NGP) Program:

- Medteknostics Inc. (Canada, January, 2005);
- Tetra Sies Inc. (Canada, January, 2005);
- Michigan State University (U. S. A., March, 2005);
- Photon Control Inc. (Canada, March, 2005);
- Intel Corporation (U. S. A., March, 2005);

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- University of Stuttgart, Institute of Physical Chemistry (Germany, June, 2005);
  - PM Recovery, Inc. (U. S. A., June, 2005);
  - Golden Tan (Canada, July, 2005);
  - Northwest Agricultural Products (NAP) (U. S. A., August, 2005);
  - Chair of Circuit Design at the Brandenburgische Technische Universität Cottbus (Germany, September, 2005);
  - RBR Ltd. (Canada, September, 2005);
  - Scionix Holland B.V. (Netherlands, October, 2005);
  - SCHOTT AG (Germany, December, 2005);
  - College of Veterinary Medicine and Biomedical Sciences, Department of Microbiology, Immunology and Pathology, of the Colorado State University (U. S. A., December, 2005);
  - Liteflex, LLC (U. S. A., December, 2005);
  - WLS Technical Services, Inc. (U. S. A., December, 2005).
- Patent Support to assist former military scientists and institutes in protecting and benefiting from the use of their research and technology;
  - Seminars, Workshops, and Training Activities to provide opportunities for former weapon scientists to build their capability to attract professional interest and research funding from a variety of sources.

Patent Support Program provides funds to scientists to pay for patent applications, so that their intellectual property is protected and can be transferred without risk of losing any benefits. To date, the STCU has given funds to help scientists apply for over 200 national, foreign, and international (PCT) patents, helping secure this intellectual property in within several important technology markets.

Seminars, Workshops, and Training Activities, which assists scientists and institutes in developing their abilities to successfully make their technical knowledge and research services available to their science peers and to paying technology customers. This includes specific training programs in intellectual property protection and commercialization of science, in competitive proposal writing, technology transfer and market planning, and in presentation skills.

Another important STCU activity is the STCU Targeted R&D Initiatives Program. This program seeks to join with national-level science authorities, such as the National Academy of Sciences of Ukraine, to help former weapon scientists target their talents towards the long-term development and national priorities of their country. The STCU and NASU completed a Targeted Initiative competition in 2005 where approximately \$1 million USD in research projects were financed, focusing on Ukrainian national research priorities in nanotechnologies, environmental sciences, biotechnology, and other technology areas.

This bring total to date number of NGP Partners to 109 (US: 40, EU: 23, CA: 46)

### SCOPE OF STCU ACTIVITIES

Besides direct funding R&D Projects STCU also works in many other supplementary fields as it follows:

- Partnership Matchmaking services to connect western firms and organizations willing to finance specific research with former weapon scientists through STCU;
- Sustainability Development which provides specialized technology transfer, business and market plan analysis, and similar services to selected project teams and institutes;
- Travel Support Grants to assist former military scientists in meeting their peers, partners and collaborators, industry representatives around the world;

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The STCU has developed good relationships with the scientists, institutes and national bodies of Ukraine and in other countries working with STCU. The STCU looks to integrate its nonproliferation mission with the need for Ukraine and other STCU member countries to improve their technological position and activity, economically and within global S&T communities. The STCU sees its projects and supplemental programs as useful ways for scientists

and institutes to attract a wide variety of research income and establish effective, sustainable, and successful long-term commercial and cooperative research partnerships. The STCU hopes to be seen as a partner with Ukraine and other countries in targeting the talents of its former weapons scientific community toward making valuable contributions to its national development and international position.



# НАУКА ТА ІННОВАЦІЇ

## Science and Innovations

# 1, 2006.

# Ukraine's Former Weapons Scientists: A Resource for National Development

**Andrew A. Hood**

*Executive Director*

*Science and Technology Center in Ukraine*

## Abstract

There is an opportunity for Ukraine and the former weapon scientist nonproliferation programs to join forces as never before, because today there is a unique confluence of interests between the two. Ukraine wants to develop a competitive, innovation-based economy with a strong technology sector, but it needs help in bringing its scientific capability to bear on this goal. Nonproliferation programs are focusing on redirecting former weapon scientists into self-sustaining civilian employment, and national development initiatives provide opportunities to fulfill this focus. However, time is running out to make effective use of the nonproliferation programs, therefore Ukraine must take the lead now by implementing a well-developed national S&T strategy that integrates the nonproliferation programs in ways that bring the former weapon scientists' talents to bear on Ukrainian development priorities.

## Background

For 10 years, several bilateral and multilateral programs, like the U.S. Civilian Research and Development Foundation (CRDF) and the multilateral Science and Technology Center in Ukraine (STCU), have successfully helped ex-military scientists and institutes in Ukraine stabilize their financial and professional situation during the 1990s. In the current decade, these "former weapon scientist (FWS)" programs have been in transition, moving from providing grant funding to individual scientists toward building their capacity to find successful and beneficial applications for their research results. This is the logical next phase of the nonproliferation mission of

these FWS programs: from engagement and stabilization of the FWS situation to their permanent redirection into self-sustaining, non-weapons research employment. Activities such as CRDF's Industry programs, STCU's Partners Program, and the joint CRDF-STCU sponsored S&T Entrepreneurship Program (STEP) events are some of the tools being used to move scientists to the next level of self-sustainability and integration into developing market economies.

At the same time, Ukraine is an emerging economy taking its development to the next level. The civil-societal and economic reforms being undertaken today hold the promise of a new era for Ukraine as a market economy and as a significant source of S&T capability. Ukraine always has had a strong scientific base, having inherited a significant portion of the former Soviet military S&T complex. But even though Ukraine has this strong S&T supply-one study ranked Ukraine within the top 25% of major countries in terms of the proportion of scientists to its general population-Ukraine has yet to bring that capacity to bear on its economic and social developmental needs. Ukraine has a goal of becoming a Euro-Atlantic style innovation economy, yet Ukraine finances less than 1% of its GDP toward science and technology development. Ukraine also lags in competitiveness: only about 4-5% of its GDP activity results from technology exports.

## Discussion

Today, there is confluence of Ukrainian interests and the interests of the FWS programs. Ukraine needs assistance in creating the kind of "knowledge-based" econo-

my that developed Euro-Atlantic countries have, and the FWS programs need guidance in targeting their programmatic efforts and financial resources so as to effectively place FWS and their institutes into productive, self-sustaining civilian research positions. Ukraine needs to use its entire scientific base to achieve its S&T development goals; FWS and their institutes make up a large portion of Ukraine's existing scientific base and probably its strongest S&T capability. So clearly, a synergy can exist between Ukraine and the FWS programs in moving former weapon scientists and institutes into a productive role in Ukraine's national development.

Already there are small examples of this synergy in practice. CRDF has much experience in designing thematic calls for research proposals that address specific problem sets, such as HIV/AIDS research. The Ukrainian government assists in financing these kinds of CRDF activities through contributions from its state budget (totaling over \$1.8 million USD since 1995). The STCU and National Academy of Sciences of Ukraine began a Targeted R&D Initiative for 2005, where both agencies will share equally in the financing of \$1 million USD in projects focused on national science priority areas identified for Ukrainian state budget financing.

What obstacles exist toward expanding on these examples and building on this synergy? First, Ukraine lacks a credible, long-term national science strategy, as well as sufficient political, legislative, and state financial support to implement such a strategy. Ukraine currently allocates state budget funds towards identified national science priorities, but it is not clear if those priority areas really focus Ukrainian S&T capability on its broader socio-economic development goals. Under a clear, multi-year national science strategy, Ukrainian leaders can link national development objectives to S&T priorities areas and funding levels, so as to more effectively develop a vibrant innovation technology sector in its economy. With Ukraine spending less than 1% of its GDP to support science (unlike the 2-3% GDP spent by U.S. and European governments), defining a national science strategy and then targeting priority research areas within that strategy seems a necessary, cost-effective first step.

Another obstacle is the tendency for Ukrainian national leaders to overlook the former military science complex as a domestic tool to achieve Ukrainian national development objectives. This former weapons S&T complex enjoyed a large share of the Soviet support in science development, and hence that complex possesses some of the best S&T research and development capability in

Ukraine. It is an under-utilized supply of domestic expertise that is a valuable national asset. Here, the current focus of the FWS nonproliferation programs on integration and self-sustainability could be used to assist Ukraine in focusing both the capabilities of its former weapon scientists as well act as a bridge to the international science and business communities, bringing specific outside expertise together with Ukrainian national science leadership, former military scientists, and civilian and academic research entities to promote a dialogue and perhaps direct assistance to Ukraine as it develops this national science strategy.

There is not much time, however, to make effective use of the current FWS programs. Programs like CRDF and STCU are beginning to see the twilight of their nonproliferation mandate and funding, due to competing global security needs and the general perception that the ex-Soviet FWS programs created during the 1990s are coming closer to reaching their nonproliferation objectives. Ukraine must take a stronger leadership role now, both over its own political processes and among its bilateral and multilateral partners in the FWS nonproliferation programs. For 10 years, Ukraine has played a relatively minor role in guiding the FWS programs, never providing concrete suggestions on how the FWS programs could contribute to Ukraine's long-term national S&T needs. Ukraine must become more a active player in defining a strategy that provides directions to target the FWS programs more effectively toward Ukrainian developmental objectives.

## Recommendations

1. Ukrainian government and national science organizations must take the political lead in developing a comprehensive, multi-year national science and technology strategy that focuses Ukraine's S&T capability on developing Ukraine as an innovation economy, with a robust technology sector and an improved level of competitiveness. Ukrainian national leaders should also firmly commit to implement and support that strategy (politically and financially) as part of Ukrainian civil, social, and economic reforms.
2. Ukrainian national authorities must take the lead in working with its international partners to integrate the bilateral and multilateral former weapon scientist programs into Ukraine's national S&T strategy, leveraging those programs while they are still viable and using them to bring the FWS capabilities to bear on Ukrainian national S&T development priorities.

МІЖНАРОДНИЙ СУСПІЛЬНО-ПОЛІТИЧНИЙ ТИЖНЕВИК

# ДЗЕРКАЛО ТИЖНЯ

# 20 Saturday 27 May - 2 June (599), 2006

## WHO ARE THE WINNERS?

*Valentyna Gatash*

Organizers and partners of the competition will award the winners and people who ranked second and third in the competition-2006, who have presented scientific-popular articles about the developments of Ukrainian scientists, as well as photos on scientific subjects at the verdict of the jury. Besides the participants of the competition, the number of guests will include representatives of the National Academy of Sciences of Ukraine,

the Ministry of Education and Science, the Science and Technology Center in Ukraine, the British Council, innovative enterprises and organizations, scientists and journalists. All people willing to take part are welcome. The names of winners and people who ranked second and third in the competition 2006, their articles and photos, as well as ratings of the jury will be published on the site of the competition.

<http://www.zerkalo-nedeli.com/ie/razdel/599/3100/>

## Popularity Studies: Regress or stagnation?

*Valentyna Gatash*

The All-Ukrainian competition of scientific-popular articles and photos “Science and Innovations to Society” starts for the third time already. The aim of organizers and partners of this project has remained the same – to induce scientists and journalists to tell the society about the things scientists do today and what discoveries and new technologies one can be await from them in the nearest years to come. The task has remained the same as well – to increase the circle of authors who can interestingly and clearly tell about the most complicated research and to demonstrate the importance of science in the modern world to the readers.

69 scientific-popular articles, written mainly by scientists and journalists, as well as 71 photos, whose authors were the representatives of various specialties, basically the youth, including pupils and students, were accepted to the competition in 2005. The interest to the project was not a small one – about 10 thousand visitors from 46 countries visited the site of the competition. Even if taking into account the fact that the overwhelming majority of the visitors were Ukrainian citizens, this is a rather significant fact. Works of the winners – both articles and photos – were published in different periodicals. That is, the competition-2005 has obviously demonstrated that there is science in Ukraine and there are people who can write about its achievements, there is an interest of the readers to this theme.

At the same time one cannot but note that the Ukrainian popular studies now go through if not regress, but obvious stagnation. While in the whole world new forms are being added to the known ones of transfer of scientific information to the masses– scientific cafes, clubs for children, interactive scientific museums, activity of the so-called communicators of science, et cetera – in Ukraine, a large European country, even its traditional forms still are not developed. The country does not have any modern mass scientific-popular journal, news of domestic science, as a rule, are not included into the news broadcasts of TV channels, are published not even in all public-scientific newspapers and journals, and in the bookstores one cannot find scientific-popular books, published in Ukraine, both by domestic authors and in translation. The very mechanism of information transfer from scientific institutes and higher educational institu-

tions into mass media also does not exist.

As a result of this, citizens of Ukraine not only do not see practical results of the scientific work in their everyday lives, but also know nothing about them. In a sociological research, conducted by a Kharkiv school-girl Polina Vlasenko, present-day teenagers did not name a single name which had any connection to science of education, no one even remembered our only one astronaut among the names-symbols of modern Ukraine. More than significant is another fact: the main financial sponsors of Ukrainian competitions of scientific-popular articles and photos are now international organizations – the Science and Technology Center in Ukraine and the British Council. The only one large scientific domestic sponsor is corporation “Kvazar-Micro”, but the Ukrainian technoparks, which took an active part in the organization and funding of the project and supported the competition in 2004, quit the number of donors against their will.

What forces the organizers and partners to continue the competition? First, faithful partners, sponsors and associates. Second, the participants, who become more and more “younger” – if in 2004 only 2% of the total number were included into the column “under 20 years old”, then in 2005 the young people counted for 16%. Third, the consciousness of the indisputable circumstances that Ukraine is destined to become a neocolonial country without the development of science and technologies. There is no alternative. All this taken together impelled the Organizing Committee to declare the beginning of the III All-Ukrainian Competition of scientific-popular articles and photos of 2006. Its conditions are published on the site [www.nauka-info.com.ua](http://www.nauka-info.com.ua). There one can also find all accepted texts and photos, as well as the information about the results of the past competitions, including snapshots of the happy winners, who received monetary prizes and presents. The electronic address of the Organizing Committee is: [konkurs@nauka-info.com.ua](mailto:konkurs@nauka-info.com.ua). The results of competition-2006 will probably be the very moment of truth, which will show what will supersede the stagnation of the Ukrainian popular studies

<http://www.zerkalo-nedeli.com/ie/show/599/53450/>



<http://www.nauka-info.com.ua/eng/index.php>

## UKRAINIAN COMPETITION IN POPULAR SCIENTIFIC ARTICLES

# AUTHORS - WHAT IS THE PUBLIC DEMAND FOR THEIR WORKS?

### CONGRATULATIONS TO WINNERS

The winner sign and the premium in 5000 hrivnas received a journalist Olga Boglyavska from Zaporozia who took first place for best popular scientific article. Her material was "Our knee won't rust" and dedicated to development of knee prosthetics by specialists from Zaporozia Plant "Motor Sych". It that was previously published in "National Technical Newspaper".

Second place and the premium in 2500 hrivnas awarded to journalists of "NTN" to Sergiy Prasolov and Marina Savinova for an article "avalanche" from "Provincial Science" series. It tells about developments of scientists from Donbas State Machine-building Academy.

Third place and the premium in 1250 hrivnas received a scientist from Kiev Vladislav Shumlyavskiy for an article "Degradation". It describes degradation process in plant and animal world influenced by technological pollution.

Best article award in physics took to Crimea a radio-astronomer Oleksander Volvach who wrote a material "Is it possible to foresee?" about problems of space garbage in near-earth orbit.

Oleksandr Kozin, a schoolboy from Kryvoy Rig was awarded by "Kvazr-Mikro" Corporation with PC for being the youngest enterprising participant of the article competition.

"National Technical Newspaper" became prize-winner of National Academy of Sciences and Agency of Scientific News "Inform-science" (Russia) award.

Scientific photos prize-winner is a student from Kiev Polytechnic Institute, Oleksander Tyhostup. He was awarded for a picture "In internecine embrace" where you can see spider meeting bumblebee. He was awarded by photo camera "Olimpus E-300" by British Council. Second place took Sergiy Skalozub from Kremenchuk for "Best scrutiny".



Third place took a scientist from Kharkov, Oleg Gorbulin for a photo called "Mircojungle".

Diversity of authors of photos and articles received special prizes from sponsors and partners of the competition.

All the Competition materials you can find following the link: [www.nauka-info.com.ua](http://www.nauka-info.com.ua)

Significant Statistics

69 articles were accepted for the Competition. Majority of them were sent from Kiev — 30, from Kharkov — 14, from Lvov — 5. Out of which 57 were written in Russian, 30 — in Ukrainian, and 7 — in English. The humanities attracted most of the writers — 29, technologies — 25, biology, medicine and chemistry — 20, astronomy, physics and math — 13, ecology — 12. The lion's share of participants is taught life: 35 year of age and older were 52 persons. Under 20 years of age — 9 participants. Among the participants majority were scientists — 33 persons, less were journalists — 21, and other — 28. Out of them 12 persons took part in the Competition 2004.

For the Scientific Photo Competition were accepted 71 photos. Majority were sent from Kiev — 27, then Odessa — 11, and Kharkov — 8. In this category "biology, medicine and chemistry" theme were chosen by over a half

of all participants, and at the same time whilst the humanities risked to visually present only four persons. Majority photo authors — 60 — haven't crossed 35 years barrier. At that 16 participants haven't even turned 20 years old. There were just a few journalists — 6, a little bit more were scientists — 15, and majorities were "other professions" — 54 people.

Competition web site was attended nearly by 10 thousands of visitors from 46 countries. It is more than the last year. Even if to consider that 75% made up people from Ukraine it still is a considerable fact.

Translation from Scholastic to Natural

Unfortunately, the number of articles meeting the requirements and accepted by the Jury has not been so great as the public interest to the Competition. Though one cannot say that we have nothing to write about. According to the official statistics, there are more than 1500 scientific and technological organizations, design offices and research institutions in Ukraine. Let a half of them have themes of public interest! I even wouldn't like to mention that state prizes for achievements in science and engineering are awarded annually. But maybe just few of them have information of such competition? One cannot say that — we have published the appropriate information in four national newspapers and two magazines which total circulation makes almost one million copies.

Sure, there are well-written and interesting texts which have been already published in mass media or about to come out after the competition. They have become winners. But, first of all, some articles are shockingly pseudo-scientific. Secondly, most of them address very important and interesting topics but require thorough editing or rewriting. Generally speaking, that is clear. Just a few journalists have degrees in science and others are not so experienced in popular scientific texts.

We try to be a part of educated Europe where a great number of such newspapers, magazines and books come out, there are a lot of science news agencies and TV channels but the Ukrainian popular scientific literature is likely to fall into stagnation — we can even say that it is about to die at all.

— What is the reason of such paradoxical phenomenon? — this question is addressed to one of the Members of Jury, Editor of Science column in 'Today' (Segodnya) Newspaper, Ms. Ganna Khomenko, — You know, there are a lot of excellent popular scientific magazines in other former Soviet republics, both Russian and international brands — 'Science & Technology', 'Science & Technology News', 'World of Science', 'Popular Mechanics', etc.

— I was very pleased when I was proposed to become a Member of Jury. I wondered that I would be able to read a great many excellent articles and find hundreds of professional young authors. Mostly materials presented to the Jury were written by scientists who were indif-

ferent whether their articles would be read by regular people or not. They just wrote of subjects interesting for them. Some of those articles were really interesting. But those written for newspapers were bad at all. Some materials were interviews, even sent from abroad, but almost all of them had one common defect — they expressed narrow ideas and sometimes simply promoted certain products. But only those journalists who 'live' in these fields and love their work could be successful! They should be united and be able to exchange their experience, including such events as our competition. Traditions of scientific journalism should not be forgotten, new generation should not discover America again. I'm absolutely sure that we will see the time when this kind of periodicals will be in great demand. Even in the nearest future. That is why I would like to wish all the participants to devote themselves to popularization of science and improve their skills. Even to those who received no awards this time. Trust me, it is a really hard work to write a clear, interesting and serious scientific article — each phrase should worth its weight in gold. You should look for and find those people who are gifted at such things in order that when journalists-scientists will be demanded by our society we would be proud to say that science is still alive in Ukraine and we, journalists, are ready to translate it from scholastic to natural language.

#### **WHETHER WE COULD CATCH UP VISIONS OF SCIENCE OR NOT?**

It was already the second Popular Scientific Article Competition and situation with that genre was already clear, but competition for the Ukrainian scientific photos became a real 'minefield' for its organizers. How many people will send their works? Will they meet competition idea and quality requirements? To be brief, shall we be able to award anybody at all?

Now we may say that our apprehensions have been groundless. The Organizing Committee accepted 71 photos. It is interesting to note that only two participants positioned themselves as professional photographers. And only six journalists and fifteen scientists took participation, other participants were referred to Category 'Others'. It was clear that scientific photography was not considered a profession in our country. It's just a hobby for schoolchildren and students, programmers and engineers, football players and lawyers, bankers and chemists, teachers and designers, unemployed and housewives. Iryna Osypova introduced herself just in that way — 'a housewife', she presented a beautiful photo named 'Let's love each other!' — she headed the list of winners. Sergiy Skalozub from Kremenchuk, a chemical engineer at UKRNAFTA, ranked the second for his photo and Oleg Gorbulin, a scientist, Doctor of Biology, Kharkiv National University, won the third place.

Our scientific photographers are able to make very interesting pictures, including by use of light and electron microscope and other devices.

I'd like to say that development of national scientific photography greatly depends upon demand of the Ukrainian mass media. They already know the difference in prices for such photos at domestic and international markets, but prefer to publish pictures produced by foreign agencies mostly.

***THE 2005 COMPETITION HAS FINISHED. LET'S WAIT FOR THE 2006 COMPETITION!***

One of the strategic aims for our 'Science and Innovations — to Society' project is mentioned above. The task for 2004 and 2005 Competitions was to make certain review of abilities — to find professional photographers, interesting and important scientific topics, partners and sponsors, and to make these conducted on regular basis. These tasks have been certainly performed.

Now we have every reason to be optimists. First of all, a certain circle of devoted partners and sponsors who sup-

ported our competitions in 2004 and 2005 has been formed — we can even say that those competitions should not be held without their assistance. The Organizing Committee would like to thank all those people who supported us and appropriated certain funds for awards. They are — Science & Technology Center in Ukraine, British Council, Quasar-Micro Corporation, National Academy of Sciences of Ukraine, Ministry of Education and Science of Ukraine, State Fundamental Research Foundation, Digital Photographer Magazine, popular scientific magazine University, All-Ukrainian Technology Newspaper, Tekhnomist International Charitable Foundation.

I would also thank the Executive Director of the Science & Technology Center in Ukraine, Mr. Andrew Hood, who was one of the first persons to support our idea, British Council and especially Messrs. Terry Sendel and Viktor Kyrylenko who initiated such nomination as a 'Scientific Photo'.



## UKRAINIAN COMPETITION "Science and Innovations for Society"

### COMPETITION 2005 RESULTS Competition 2005 winners are announced

Award ceremony in photographs

Ukrainian Popular Scientific Article and Scientific Photograph "Science and Innovations for Society" of the year 2005 is over. Its results were summed up on December 8th in Kiev in the Big Conference Hall of the National Academy of Sciences. Competition Committee announced the names of winners and laureates.

First place for the popular scientific article, the prize-symbol and prize-money in the amount of UAH 5,000 were awarded to Olga Boglevskaya, a journalist from Zaporozhye. Her article "Our Knee Won't Rust" is dedicated to development of knee-prosthetic devices by specialists of the Zaporozhye "Motor-Sich" plant and medical men from Zaporozhye and Dnepropetrovsk.

Second place and prize-money in the amount of UAH 2,500 were awarded to Sergey Prasolov, a journalist from Donetsk, for the article called "Avalanche", which is one of the series of "Provincial Science" articles and which narrates about unique developments of Donbass scientists. The article is written in co-authorship with Marina Savinova.



*Olga Boglevskaya - 1st prize winner - holds the main prize-symb of the Popular Scientific Article Competition*

Third place and prize-money in the amount of UAH 1,250 were awarded to Vladislav Shumlyanskiy, a scientist from Kiev, for the article called "Degradation", which describes degradation of the flora and fauna under man-caused pollution influence.



Award for the best article about physical sciences in the Year of Physics was taken by a radio-astronomer Alexander Volvach from Crimea, who wrote the article "Is It Possible to Foresee?" about problems of space rubbish in the near-earth orbit.

"Kvazar-Micro" Corporation awarded Alexander Kozin, a schoolboy from Krivoy Rog, as one of the youngest and most enterprising participants of the article competition, with a personal computer.

Alexander Tikhostup, a student from Kiev Polytechnic Institute, became the winner of the Science Photograph Competition. His work is called "Fatal Embrace" and depicts a meeting of a spider and bumblebee. "British Council" awarded him with a picture-camera.



A number of authors of articles and photographs were awarded with special prizes from Competition organizers and partners.



<http://www.nauka-info.com.ua/eng/index.php>

## Project

# SCIENCE FOR SOCIETY RESEARCH, TECHNOLOGIES, INNOVATIONS

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is intended to:

- popularise achievements of the domestic science, attract public attention to its problems and prospects of further development, promotion of prestige of science in the Ukrainian society;
- promote wider implementation of scientific developments and innovations into practice;
- reveal talented popularizers of science of various professions that can speak about significant achievements and results of science and technology development in Ukraine in a simple and clear, interesting and correct manner;
- involve youth into scientific and innovation activity.

Initiators of the project that formed a public organisation "SCIENCE-INNOVATIONS-ENTREPRENEURSHIP", will inform you here about all events, competitions and other activities, which are held within the project framework. Pay attention to the following site sections: "Academic Council", "Interesting, useful, topical...".

### **ABOUT THE POPULAR SCIENTIFIC ARTICLE AND SCIENTIFIC PHOTO COMPETITION**

Popular science articles and photographs on the topics of science and innovation dedicated to specific achievements of the Ukrainian science of the recent years are accepted for the competition. Works, sent for the competition, should be those created during the current year, both unpublished and published. Articles and captions of photographs could be written in one of the three languages: Ukrainian, Russian and English.

Competition works should reflect interesting research, technologies and successful innovation projects of Ukrainian scientists or foreign scientists that worked in co-operation with Ukrainian ones, which were performed or developed in the past few years in the interests of society.

Articles should be concise and contain interesting facts and written in a decent literary language. They should not contain excessive technical details, terminology and formulas that could be unclear for ordinary readers, but they should clearly state the problems, the solution of which is undertaken by research, its history, idea and result and how it could be used and what results could be achieved.

Photographs should be non-trivial, vivid and artistic and made at a decent technical level and reflect both scien-

tific objects and processes of scientific research.

Results of the competition are summed up by a jury of journalists, scientists and independent experts. Members of the jury will not know the names of the authors before the awarding procedure.

### **ABOUT THE BEST SHORT SCIENCE-FICTION STORY COMPETITION**

Ways of the civilisation in the XXIst century would be determined by rapid development of science and technology. Is our society ready to accept both positive and negative consequences of new discoveries? What will their implementation give to society? Could the science and new technologies turn out to be a sui generis Trojan horse for the Earth's civilisation? Or, maybe, humanity is heading towards its golden age and successful settlement on other planets of the Universe? How will a man or woman react, when he or she comes across unknown technologies or laws of nature? Answer is not obvious. We invite all persons interested to answer these and other questions in a belles-lettres form through participating in Best Short Science-Fiction Story Competition called "Galilei", in the basis of which lies a scientific idea, hypothesis, research, or discovery. Remember that positivism, rationalism and humanism are the moral basis of science fiction all over the world.



Міністерство України з питань надзвичайних ситуацій та у справах захисту населення від наслідків Чорнобильської катастрофи



Частково Відкрита Угода  
Ради Європи



<http://www.tesec-int.org/Ukrainian.htm>

## International Conference

# "20 years since Chernobyl Disaster. A look into past"

*Kyiv, Ukraine, April 24-26 2006  
Report Extract*

## Dependency of I37Cs Contents in Plants from Soil Solution Parameters

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The Problem of accumulating of I37Cs by plants has been investigated during half of the century. Recently great numbers of investigations of the issue were conducted. Many of the investigators today agree that accumulation of I37Cs by plants is defined by Soil solution parameters.

Today we have not a reasonably good method for prediction of transfer of radionuclides from soil to plants. On this reason agriculture of Ukraine and Belarus have enormous losses. Often contamination of radionuclides in plants from cultivating lands exceeds allowed normative. And on the contrary, often the lands, can yield plant with little contamination of radionuclides, are withdrawn from agriculture circulation. It is necessary to have reliable method of prediction. This is actual for all countries, because never is ensured from an accident "a la Chernobyl". Moreover, soil may be polluted with radionuclides in another ways, too.

The target of the project - elaboration of available method of prediction of transfer of Sr-90 and Cs-137 to plants.

The famous English scientist Scott Russel affirms, that "...Sr-90 and Ca are absorbed by plant in proportion to their concentrations in the equilibrium soil solution)). This statement means for practices the next. For prediction of transfer of Sr-90 from the soil to the plant we can measure the ratio  $^{90}\text{Sr}/\text{Ca}$  in the soil solution and then calculate the contamination of Sr-90 in the plant on data from reference book on Ca content of this plant. But, unfortunately, a number of scientists disagree with the opinion of Scott Russel.

We want to clear the matter up, who is right? We will use up-to-date direct precise methods for determination of Sr/Ca ratio in the soil solution and in the plant. An similar investigations will be carried out and for ratio Cs/Ca. We will measure specimens with high concentration of radionuclides from Chernobyl zone from the arable lands with soil of different types.

And then we are planning to elaborate and to probe in practice the reliable method of prediction of transfer of Sr-90 and Cs-137 from soil to plants.

The work was conducted under financing coming from STCU (Project #2390)

### Literature

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#1 (157), January 5, 2006.

UKRAINIAN COMPETITION IN POPULAR SCIENTIFIC ARTICLES

# AUTHORS — WHAT IS THE PUBLIC DEMAND FOR THEIR WORKS?

## Congratulations to Winners

The winner sign and the premium in 5000 hryvnas received a journalist Olga Boglyavska from Zaporozhia who took first place for best popular scientific article. Her material was "Our knee won't rust" and dedicated to development of knee prosthetics by specialists from Zaporozhia Plant "Motor Sych". It that was previously published in "National Technical Newspaper".

Second place and the premium in 2500 hryvnas awarded to journalists of "NTN" to Sergiy Prasolov and Marina Savinova for an article "avalanche" from "Provincial Science" series. It tells about developments of scientists from Donbas State Machine-building Academy.

Third place and the premium in 1250 hryvnas received a scientist from Kiev Vladislav Shumlyavskiy for an article "Degradation". It describes degradation process in plant and animal world influenced by technological pollution.

Best article award in physics took to Crimea a radio-astronomer Oleksander Volvach who wrote a material "Is it possible to foresee?" about problems of space garbage in near-earth orbit.

Oleksandr Kozin, a schoolboy from Kryvoy Rig was awarded by "Kvazr-Mikro" Corporation with PC for being the youngest enterprising participant of the article competition.

"National Technical Newspaper" became prize-winner of National Academy of Sciences and Agency of Scientific News "Inform-science" (Russia) award.

Scientific photos prize-winner is a student from Kiev Polytechnic Institute, Oleksander Tyhostup. He was awarded for a picture "In internecine embrace" where you can see spider meeting bumblebee. He was awarded by photo camera "Olimpus E-300" by British Council. Second place took Sergiy Skalozub from Kremenchuk for "Best scrutiny".

Third place took a scientist from Kharkov, Oleg Gorbulin

for a photo called "Mircojungle".

Diversity of authors of photos and articles received special prizes from sponsors and partners of the competition.

All the Competition materials you can find following the link: [www.nauka-info.com.ua](http://www.nauka-info.com.ua).

## Significant Statistics

69 articles were accepted for the Competition. Majority of them were sent from Kiev — 30, from Kharkov — 14, from Lvov — 5. Out of which 57 were written in Russian, 30 — in Ukrainian, and 7 — in English. The humanities attracted most of the writers — 29, technologies — 25, biology, medicine and chemistry — 20, astronomy, physics and math — 13, ecology — 12. The lion's share of participants is taught life: 35 year of age and older were 52 persons. Under 20 years of age — 9 participants. Among the participants majority were scientists — 33 persons, less were journalists — 21, and other — 28. Out of them 12 persons took part in the Competition 2004.

For the Scientific Photo Competition were accepted 71 photos. Majority were sent from Kiev — 27, then Odessa — 11, and Kharkov — 8. In this category "biology, medicine and chemistry" theme were chosen by over a half of all participants, and at the same time whilst the humanities risked to visually present only four persons. Majority photo authors — 60 — haven't crossed 35 years barrier. At that 16 participants haven't even turned 20 years old. There were just a few journalists — 6, a little bit more were scientists — 15, and majorities were "other professions" — 54 people.

Competition web site was attended nearly by 10 thousands of visitors from 46 countries. It is more than the last year. Even if to consider that 75% made up people from Ukraine it still is a considerable fact.

## Translation from Scholastic to Natural

Unfortunately, the number of articles meeting the requirements and accepted by the Jury has not been so great as the public interest to the Competition. Though one cannot say that we have nothing to write about. According to the official statistics, there are more than 1500 scientific and technological organizations, design offices and research institutions in Ukraine. Let a half of them have themes of public interest! I even wouldn't like to mention that state prizes for achievements in science and engineering are awarded annually. But maybe just few of them have information of such competition? One cannot say that — we have published the appropriate information in four national newspapers and two magazines which total circulation makes almost one million copies.

Sure, there are well-written and interesting texts which have been already published in mass media or about to come out after the competition. They have become winners. But, first of all, some articles are shockingly pseudo-scientific. Secondly, most of them address very important and interesting topics but require thorough editing or rewriting. Generally speaking, that is clear. Just a few journalists have degrees in science and others are not so experienced in popular scientific texts.

We try to be a part of educated Europe where a great number of such newspapers, magazines and books come out, there are a lot of science news agencies and TV channels but the Ukrainian popular scientific literature is likely to fall into stagnation — we can even say that it is about to die at all.

— What is the reason of such paradoxical phenomenon? — this question is addressed to one of the Members of Jury, Editor of Science column in 'Today' (Segodnya) Newspaper, Ms. Ganna Khomenko, — You know, there are a lot of excellent popular scientific magazines in other former Soviet republics, both Russian and international brands — 'Science & Technology', 'Science & Technology News', 'World of Science', 'Popular Mechanics', etc.

— I was very pleased when I was proposed to become a Member of Jury. I wondered that I would be able to read a great many excellent articles and find hundreds of professional young authors. Mostly materials presented to the Jury were written by scientists who were indifferent whether their articles would be read by regular people or not. They just wrote of subjects interesting for them. Some of those articles were really interesting. But those written for newspapers were bad at all. Some materials were interviews, even sent from abroad, but almost all of them had one common defect — they expressed narrow ideas and sometimes simply promoted certain products. But only those journalists who 'live' in these fields and love their work could be successful! They should be united and be able to exchange their experience, including such events as our competition. Traditions of scientific journalism should not be forgotten, new generation should not discover America again. I'm absolutely sure that we will see the time when this kind of periodicals will be in great demand. Even in the

nearest future. That is why I would like to wish all the participants to devote themselves to popularization of science and improve their skills. Even to those who received no awards this time. Trust me, it is a really hard work to write a clear, interesting and serious scientific article — each phrase should worth its weight in gold. You should look for and find those people who are gifted at such things in order that when journalists-scientists will be demanded by our society we would be proud to say that science is still alive in Ukraine and we, journalists, are ready to translate it from scholastic to natural language.

## WHETHER WE COULD CATCH UP VISIONS OF SCIENCE OR NOT?

It was already the second Popular Scientific Article Competition and situation with that genre was already clear, but competition for the Ukrainian scientific photos became a real 'minefield' for its organizers. How many people will send their works? Will they meet competition idea and quality requirements? To be brief, shall we be able to award anybody at all?

Now we may say that our apprehensions have been groundless. The Organizing Committee accepted 71 photos. It is interesting to note that only two participants positioned themselves as professional photographers. And only six journalists and fifteen scientists took participation, other participants were referred to Category 'Others'. It was clear that scientific photography was not considered a profession in our country. It's just a hobby for schoolchildren and students, programmers and engineers, football players and lawyers, bankers and chemists, teachers and designers, unemployed and housewives. Iryna Osypova introduced herself just in that way — 'a housewife', she presented a beautiful photo named 'Let's love each other!' — she headed the list of winners. Sergiy Skalozub from Kremenchuk, a chemical engineer at UKRNAFTA, ranked the second for his photo and Oleg Gorbulin, a scientist, Doctor of Biology, Kharkiv National University, won the third place. Our scientific photographers are able to make very interesting pictures, including by use of light and electron microscope and other devices.

I'd like to say that development of national scientific photography greatly depends upon demand of the Ukrainian mass media. They already know the difference in prices for such photos at domestic and international markets, but prefer to publish pictures produced by foreign agencies mostly.

## THE 2005 COMPETITION HAS FINISHED. LET'S WAIT FOR THE 2006 COMPETITION!

One of the strategic aims for our 'Science and Innovations — to Society' project is mentioned above. The task for 2004 and 2005 Competitions was to make certain review of abilities — to find professional photographers, interesting and important scientific topics, partners and sponsors, and to make these conducted on regular basis. These tasks have been certainly performed.

Now we have every reason to be optimists. First of all, a certain circle of devoted partners and sponsors who supported our competitions in 2004 and 2005 has been formed — we can even say that those competitions should not be held without their assistance. The Organizing Committee would like to thank all those people who supported us and appropriated certain funds for awards. They are — Science & Technology Center in Ukraine, British Council, Quasar-Micro Corporation, National Academy of Sciences of Ukraine, Ministry of Education and Science of Ukraine, State Fundamental

Research Foundation, Digital Photographer Magazine, popular scientific magazine University, All-Ukrainian Technology Newspaper, Tekhnomist International Charitable Foundation.

I would also thank the Executive Director of the Science & Technology Center in Ukraine, Mr. Andrew Hood, who was one of the first persons to support our idea, British Council and especially Messrs. Terry Sendel and Viktor Kyrylenko who initiated such nomination as a 'Scientific Photo'.