International Science & Technology Center

Biotechnology, Public Health, Agriculture
Sustainable Nuclear Energy with Enhanced Safeguards, Safety and Security
Environmental Remediation and Climate Change Mitigation
Renewable and Environmentally Friendly Energy Technologies
Counter-Terrorism and Global Security

annual report '08

Table of Contents

Governing Board Chairman Statement

Dr. Ronald F. Lehman II

The International Science and Technology Center (ISTC) set for itself two principle challenges for 2008. First, the ISTC worked to enhance genuine science partnerships in furthering international scientific cooperation. Second, the ISTC worked to be more responsive, in a changing world, to the needs of its Governing Parties, member states and many commercial and private Partners.

The arrival in May 2008 of the ISTC's new Executive Director, Adriaan van der Meer, marked an important event in the Center's evolution. Priority has been given to restructuring the Center. This has required better communication at all levels. Programs and personnel have been refocused to keep pace with the demands of ISTC's member governments, cooperating institutes, and partners in industry and academia. This work continues in 2009. The Center is positioning itself well as the changing political, economic, and social climate continues to offer new opportunities and challenges to the organization.

The experience accumulated by the ISTC over nearly 15 years of operation should prove valuable in the times ahead. Counting all the Parties including those countries that are members of the EU, one in five of the nations of the world are represented in the Center and more are seeking ways to participate. Canada and the EU have made clear financial commitments ahead to 2012. The new US Administration is already working closely with Russia and other countries in nonproliferation and international science cooperation and engagement. Whether related to biological, chemical or nuclear technologies, the reinforcement of programs guaranteeing international partnerships for peaceful scientific development is important to economic growth and greater security for everyone. The ISTC is central in the network of global programs active in this vital work and is ready to offer its experience to other countries taking into account emerging challenges.

The Center continues to develop its programs and initiatives to support scientific cooperation, commercialization and sustainability efforts. Institutes work in partnership with the Center to implement plans that will take the institutes toward self-sustainability. Also, the Parties have highlighted five areas of scientific and programmatic development. These have received priority attention, and we have sought to document the actual scientific results achieved. Creating real and sustainable jobs and bringing new, peaceful technologies to the marketplace are not our only goals, but they should be a key criteria of success.

New initiatives and slimmed down procedures that increase ISTC responsiveness are in the pipeline. In 2008, for example, the ISTC introduced a new funding support initiative to encourage Canadian private companies to begin R&D projects. Canadian companies can now apply for matched funding up to $40,000 CND toward a first project. Other such initiatives are under discussion as the Center seeks to broaden the use of its services to the private sector.

On behalf of the Board, I would like to thank all the staff of the ISTC Secretariat, those based in the Moscow Headquarters and the 6 Branch Offices in Armenia, Belarus, Georgia, Kazakhstan, Kyrgyzstan and Tajikistan, for their dedication and contribution to the Center throughout 2008. In particular, significant efforts have been made to increase ISTC's public profile and a broader awareness of the services that the Center can offer. The ISTC has completely redesigned its website and developed a new quarterly newsletter; and has undertaken a number of promotional events on the territories of its Governing members and with various Business Associations active in Russia.

In 2009, the ISTC celebrates its 15th anniversary. Events throughout the year will reflect this important milestone, culminating in an anniversary conference to be held in Moscow in December '09. The Conference, befitting the innovative history of the Center, will be predominantly about the future, not the past. We can all be proud of the achievements of ISTC over the last 15 years, but the real focus will be on today's and tomorrow's global security concerns, with an emphasis on how ISTC will best continue its evolution to ensure contributions to addressing urgent scientific opportunities.

Dr. Ronald F. Lehman II
Chairman of the ISTC Governing Board

ISTC – Pursuing Our Objectives

Redirection promoting innovation, science and job creation

The objectives of the ISTC are to:

- Foster the integration of former weapons scientists and engineers from Russia, Georgia and CIS countries into the global scientific community
- Contribute to the transition to market-based economies
- Provide former weapons scientists in Russia, Georgia and other countries of the Commonwealth of Independent States (CIS) the opportunity to redirect their knowledge and skills to peaceful activities
- Contribute to solving national and international technical problems
- Support basic and applied research and technology development

The ISTC coordinates the efforts of numerous governments, international organizations, and private sector industry, providing former weapons scientists from Russia, Georgia and the CIS new opportunities in international partnership. The ISTC is central in the management of these science partnerships. Through its political, legal, and financial frameworks, the ISTC contributes to fundamental research, international nonproliferation programs, and innovation and commercialization by linking the demands of international markets with the exceptional pool of scientific talent available in Russian, Georgian and CIS institutes.

2008 Highlights

Memorandums of Understanding signed with:

- International Atomic Energy Agency (IAEA)
- All Russian Institute of Experimental Physics (VNIIEF) Sarov and OKBM Afrikantov Nuclear Power Engineering Enterprise (OKBM)
- All Russian Scientific Research Institute of Technical Physics (VNIITF) Snezhinsk
- National Academy of Sciences of Belarus
- US Graham Commission visits ISTC HQ

ISTC Executive Committee

Tim Murray	Waclaw Gudowski	Adriaan van der Meer	Leo Owsiacki	Yasuhiro Yukimatsu	Sergey Vorobiev
Acting Deputy Executive Director (United States)	Deputy Executive Director (European Union)	Executive Director	Deputy Executive Director (Canada)	Deputy Executive Director (Japan)	Principal Deputy Executive Director (Russian Federation)

Executive Director Statement

Adriaan van der Meer

ISTC is an effective organization that promotes international science cooperation and open innovation around the world. It forges new international scientific partnerships. This Annual Report gives a comprehensive overview of the achievements of the Center structured around a number of thematic areas.

The Report profiles the many success stories resulting from the efforts of the Center and its many partners, from breakthrough research in physics through to the development of new nuclear medicines and alternative forms of energy such as hydrogen fuel cells.

ISTC has helped the implementation of international and national policies in the nuclear and non-nuclear energy fields as well as in areas related to health and environment. It has contributed to the economic diversification policy of Russia and other countries. In 2008, ISTC funded 79 Regular projects for a total value of $26.2 million USD. As a result of our efforts, I am proud to mention concrete results such as the creation of new job opportunities, new nuclear technologies, compounds for new medicines as well as new materials for aircraft. ISTC has brought Russian expertise to the Large Hadron Collider of CERN experimenting on the theory of the 'big bang'.

ISTC is also a matchmaking organization that assists private industry in technology search, connecting international industry with high quality institutes in Russia and beyond. Various privileges exist to contribute to a policy of open innovation. In 2008, ISTC funded 21 private partner projects representing $6.7 million USD.

The total number of projects funded since the inception of ISTC is 2,646 ($814.5 million USD). The number of beneficiary scientists since the start of ISTC is around 71,400.

One of the highlights in 2008 was the conclusion of a Memorandum of Understanding between ISTC and the International Atomic Energy Agency (IAEA). ISTC looks forward to closer cooperation with the IAEA to contribute to the international policy of nuclear non-proliferation via technical means.

2008 saw a number of arrivals and departures of senior personnel. I would like to thank Laura Schmidt Williams, former US Deputy Executive Director for her dedicated service to the ISTC. Irene Tabach, Chief Financial Officer, and Eckhard Sawatzki, Chief Procurement Officer, also completed their terms of service with the Center in 2008. ISTC has indeed been fortunate to have been able to count such individuals amongst our staff. The Board wishes them well with future endeavours, and welcomes their successors to the organization.

The world has changed since the establishment of ISTC in 1994. It is now our prime task to transform the Center to today's realities both with respect to threat reduction and new scientific challenges. I expect that in 2009, discussion on the transformation of ISTC will accelerate.

The Secretariat is willing to make its accumulated know-how available to other regions in the world. At the international level, few programs exist to ensure the promotion of a 'culture of responsibility' among scientists. The Center has built up a wealth of experience creating genuine scientific partnerships and scientist engagement.

A challenging agenda before the celebration of the 15th anniversary of ISTC is ahead of us. I look forward to working closely with all the international organizations and countries as well as individual scientists directly involved in the Center's many programs and initiatives.

Adriaan van der Meer
ISTC Executive Director

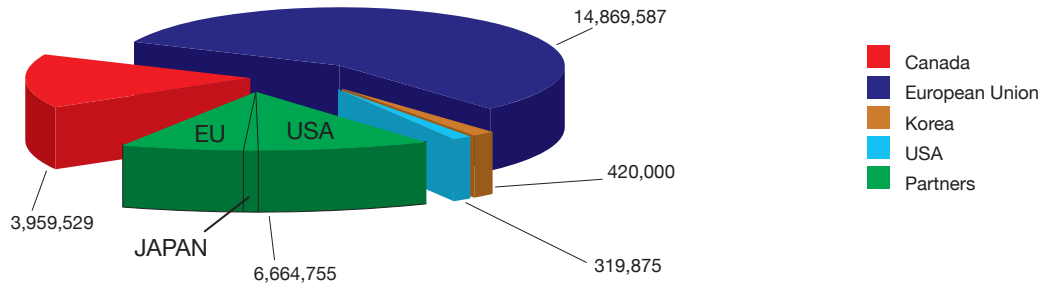
Overview of ISTC Activities in 2008

To fulfill its nonproliferation mission, the ISTC Parties, Partners and Project Collaborators contribute financial, in-kind, and human resources to the Center. These resources are used to engage former weapons scientists and technical team members in peaceful science projects through ISTC.

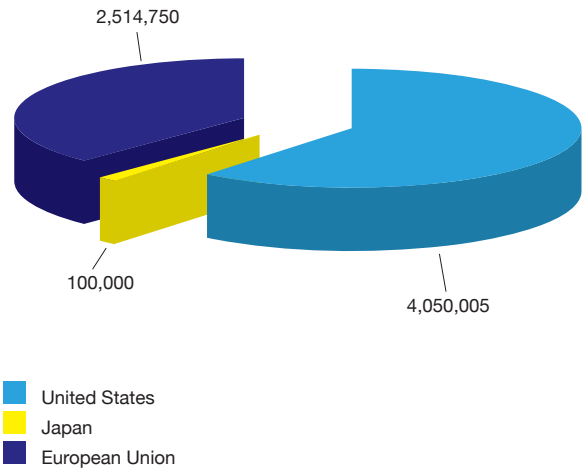
In 2008, the ISTC accomplished:

- New project funding for 79 projects in the amount of $26.2 million USD, of which ISTC Partners provided $6.7 million USD for 21 projects;
- Addition of 29 new Partner organizations, to the existing 380 Partners, who have provided $244.1 million USD in project funding since program inception

Total New Project Funding ($) in 2008 by Source



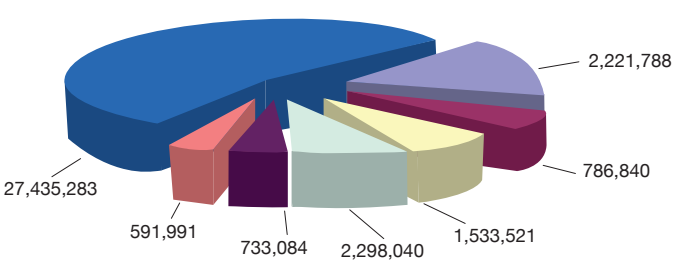
ISTC Partner Project Funding ($) by Party in 2008



Party	Type	No. of projects, Funded in 2008	Amount 2008
United States	**Total**	**11**	**4,050,005**
	G	11	4,050,005
	NG	0	0
Japan	**Total**	**1**	**100,000**
	G	0	0
	NG	1	100,000
European Union	**Total**	**9**	**2,514,750**
	G	7	2,288,768
	NG	2	225,982
Total:	**Total**	**21**	**6,664,755**
	G	18	6,338,773
	NG	3	325,982

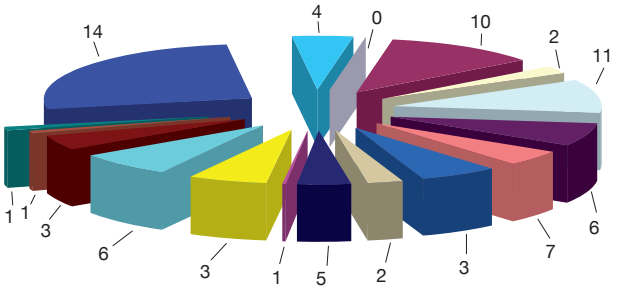
G = Government Organizations
NG = Non-Government Organizations

Grants Paid in 2008 by the ISTC to CIS Beneficiary Scientists ($)



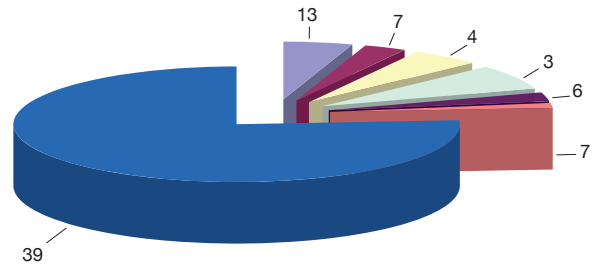
Direct grant payments to 17,162 scientists and their team members, amounting to $35,6 million USD

2008 Project Funding by Technology Area



Tech area	№ of projects 2008	Allocated funds 2008 ($)
Agriculture	0	0
Biotechnology	10	3,102,419
Biotechnology and Life Sciences	2	593,645
Chemistry	11	2,634,734
Environment	6	1,824,416
Fission Reactors	7	1,274,112
Fusion	3	1,556,364
Information and Communications	2	758,160
Instrumentation	5	1,111,102
Manufacturing Technology	1	30,108
Materials	3	1,627,250
Medicine	6	1,989,106
Non-Nuclear Energy	3	1,159,093
Other	1	170,730
Other Basic Sciences	1	334,646
Physics	14	6,835,370
Space, Aircraft and Surface Transportation	4	1,232,491
Total	79	26,233,746

2008 Project Funding Received by Beneficiary Country



Countries	№. of projects	Allocated Funds 2008 ($)
Armenia	13	4,422,503
Belarus	7	1,629,511
Georgia	4	959,775
Kazakhstan	3	1,132,148
Kyrgyzstan	6	2,025,778
Russia	39	14,228,337
Tajikistan	7	1,835,695
Total	79	26,233,746

ISTC Programmatic Directions

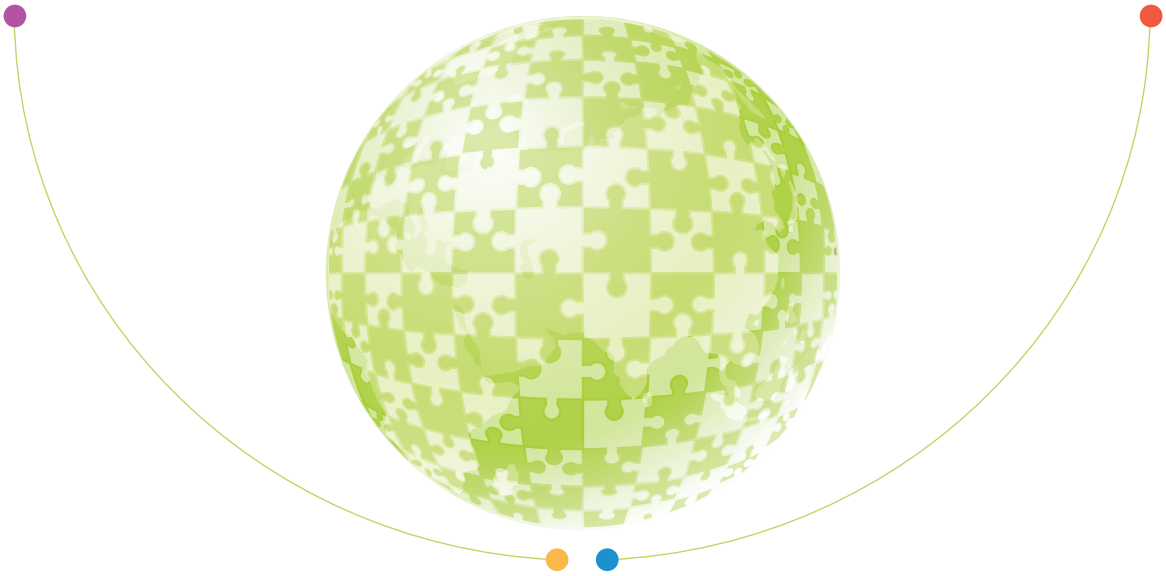
Biotechnology, Public Health and Agriculture

Sustainable Nuclear Energy with Enhanced Safeguards, Safety and Security

Environmental Remediation and Climate Change Mitigation

Renewable and Environmentally Friendly Energy Technologies
(non nuclear energy technologies)

Counter-Terrorism and Global Security



Biotechnology, Public Health and Agriculture

The drive to prevent and cure diseases that affect human beings, animals and food supply is a global enterprise with pharmaceutical research experiencing significant change and growth over recent years. Demand for new and innovative drug therapies continues to push pharmaceutical companies and biotechnology institutes to increase their productivity and efficiency.

Biotechnology and life sciences is now one of the most dynamically evolving areas of ISTC activity. Over 550 projects have been funded in this field, reaching more than $200 million USD since 1994. ISTC projects cover a variety of scientific directions in hi-tech biotechnology, medicine and agriculture, all of which are designed to bring an improvement to both human quality of life and animal health.

In drug design and development, one of ISTC's targeted initiatives area, the Center supports innovative projects and new drug developments with commercial potential, integrating cutting-edge R&D projects with preparatory support and commercialization activities. This approach fosters collaboration between technology users and technology suppliers.

Key focus areas for ISTC projects are:

- Development and implementation of new treatment methods in Nuclear and Radiation Medicine; in particular, to address very difficult cancer cases (brain, eye) and novel diagnostic/investigation methods
- International accreditation and certification of Russian institutes to quality standards
- Work towards integration of disease surveillance models, with a focus on Central Asia
- Integration of Russian institutions in the international healthcare and animal care research and service industry
- Enhancing security at key biological institutes
- Establishing strategic partnership with international organizations and further developing co-operation with Russian and CIS organizations and access to funding sources

In 2008, ISTC funding for Biotechnology, Public Health and Agriculture reached $200 million USD and 550 projects

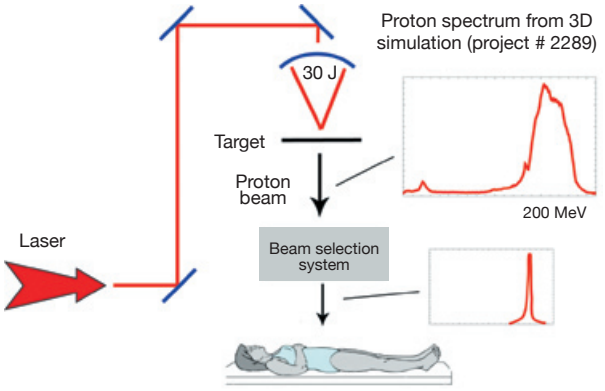
Development of New Forms of Cancer Therapy

The most predominant treatments for cancer today are chemotherapy, surgery, X-ray radiation therapy or a combination of these three methods. All existing treatments have various disadvantages, but the general drawback of each treatment method is the risk of killing healthy cells alongside cancer cells. Therefore, there is a need for more precise treatment methodologies that eliminate cancer cells from organisms, while leaving the healthy cells unaffected.

In principle, proton-beam therapy has the potential to be a more accurate treatment of cancer, especially in comparison to X-ray radiation treatment. Proton beams can be targeted at a smaller area than X-ray, resulting in a significantly smaller treatment area. Additionally, protons can be given a range of energies that result in different penetration depths into live tissue, with only the tissue above the targeted area affected. In comparison, X-rays penetrate through whole bodies, affecting more live tissue during treatment. Up to now, the generation of proton beams requires a proton accelerator, which is an expensive, complicated, and very large piece of equipment requiring special dedicated facilities.

Project # 2289, from **Russian Federal Nuclear Center – All Russian Scientific Research Institute of Technical Physics (RFNC-VNIITF) named after acad. E.I. Zababakhin, Snezhinsk, Russia** and the **Lebedev Physics Institute in Moscow**, with funding from the Canadian Government, is developing a new system that generates a proton beam generated using laser technology. The advantages of this approach are that the equipment will be much cheaper, smaller (each hospital could in principal have one), and less complicated to use.

This new approach is made possible due to a recent revolution in laser technology that has opened the door to a generation of pulses of light that can produce high-energy protons. There are various theoretical and practical issues to be resolved and these were addressed by the project team during the course of the project. The research was performed in close collaboration with Canadian collaborators from the University of Alberta in Edmonton and results of the project will be taken forward at the largest Canadian laser facility, the Advanced Laser Light Source.



Outcome:
Development of ideas to create laser generated proton beams for the treatment of cancer

Production of Radiopharmaceuticals for Cancer Treatment

The growth of demand in Russia for diagnostic and therapeutic radiopharmaceuticals is one of the results of the modernization of radio-diagnostic centers, particularly within the 'Healthcare' National Project, an initiative of the Russian government. ISTC, through its Commercialization Support Program, assisted with the upgrade and modernization of radiopharmaceuticals production lines in accordance with General Manufacturing Practices (GMP) requirements in several Russian Institutes.

In particular, ISTC support was essential to the start of an upgrade of radiopharmaceuticals at **Khlopin Radium Institute (KRI), St. Petersburg**. This support will allow the institute to prepare the facility to ultimately gain GMP certification and acquire the latest technology advancements for generating radioisotopes and synthesis of radiopharmaceuticals which will be used for early stage cancer and cardio diagnostics in hospitals and clinics of St. Petersburg.

The Khlopin Institute became involved in the development of medical radioisotope production and synthesis of radiopharmaceuticals in 1989. By 1995, the Institute, the Russian Ministry responsible in this area, Rosatom, and the St. Petersburg Healthcare Department invested approximately $5 million USD into the development of technology and equipping of the production lines. Further, these organizations teamed up in support of certification of the production facility. Khlopin Institute was the first in the Russian Federation to introduce iodine-123 labeled RPH into medical applications and the first institution that developed centrifugal extraction of technetium-99m.

Product quality (radionuclide and radiochemical purity) is on the level of the best foreign analogs but significantly cheaper to produce, which means that more people will be able to receive proper treatment. More than one million investigations have already been carried out using KRI preparations since 1995.

A similar project was supported by ISTC in 2008 in **Obninsk, Moscow Region, at the Federal State unitary enterprise 'State Research Center of the Russian Federation – Institute for Physics and Power Engineering named after A.I. Leypunsky' (IPPE)**. The project assisted the reconstruction of the existing production facilities producing radioisotopes for nuclear application and GMP-certification of activities on the production of medicines for medical radiology. IPPE has twenty years of experience in production and sales of radioisotope products to the Russian Federation, other countries of the CIS and foreign markets. IPPE has shipped radiopharmaceuticals to Russian hospitals for the last 20 years, with about five million cancer patients having had diagnostics and treatment using radiopharmaceuticals produced by IPPE.

ISTC support is critical for the Institutes, enabling them to maintain their market share in Russia but also to considerably expand the volume of sales of radiopharmaceuticals for existing international customers worldwide, in particular Canada, the EU and US. There are now plans being implemented in Russia for the creation of a number of regional nuclear medicine centers and nuclear medicine divisions in high-tech medical clinics that will provide significant growth potential for the consumption of medical radioisotope products in Russia.

Outcome:
Upgrades of radiopharmaceutical facilities to international standards

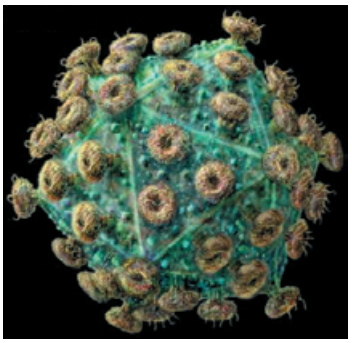
Effective Novel HIV Inhibitors

The World Health Organization (WHO) has estimated that since AIDS was first recognized in 1981, it has killed more than 25 million people worldwide and that about 0.6 percent of the world's population is currently infected with HIV. About one third of the deaths caused by AIDS annually are in sub-Saharan Africa. Currently, there is no vaccine against HIV. There are some retroviral drugs that are effective against HIV, which in general are given in a cocktail of multiple anti-HIV drugs. However, these retroviral drugs have many side effects and are expensive to administer and over time become ineffective due to mutations of the virus. Consequently, there is an urgent need for new drug therapies, with minimal side-effects, and that are cheap to produce.

The **Belarussian State University and the Belarussian Research Institute for Epidemiology and Microbiology (both located in Minsk, Belarus),** under **project # B-984**, searched for new effective HIV-inhibitors, with low toxicity, based on compounds of the polydisulphide group and related sulphur-containing compounds.

The project participants synthesized over 120 different compounds, of various sub-categories, which were tested on human cell lines that were infected with HIV. From this collection of compounds, 2 are active HIV inhibitors and 19 weakly active compounds were identified. The inhibitory activity of the 2 active samples is comparable to that of azidothymidine (or AZT, the first approved anti-HIV drug), confirming the potential of these discovered HIV inhibitors for novel anti-HIV drugs.

The project team is currently looking for industrial partners to further test these compounds and to develop them into viable anti-HIV drugs.



Structure of the Human Immunodeficiency Virus (HIV)

Outcome:
Two active and nineteen weakly active HIV inhibitors were discovered, which potentially can be developed into novel anti-HIV drugs

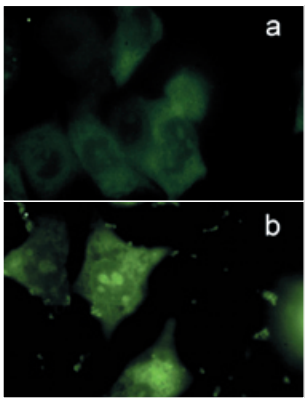
New Approaches to Drug Delivery

Most of the commonly used drugs in use today can be simply administered, taken either orally (as pills, powders or liquids) or injected directly. However, over the last few decades, new drugs have been developed that require more complex delivery systems as they are targeted to specific parts of the body. One of the difficulties is that many highly-effective new drug compounds do not cross the cell membrane (the 'wall' around cells) easily. This is also true for DNA/RNA vaccines, which is a novel method to immunize humans against bacterial, viral or parasitical infections. The basic principle of this concept is that vaccine DNA/RNA is inserted into the host cells, after which this small strain of genetic information is expressed in the host, which subsequently immunizes the host body. However, DNA/RNA is not easily transferred through the cell membrane.

To address this specific issue of transporting drug compounds or DNA/RNA into living cells, the **Mendeleev Chemical Technological University (Moscow) and the Department of Chemistry of Moscow State University**, under **Project # 3175**, funded by the European Union, have developed special molecules that assist in the transportation into cells.

Outcome:
Multiple novel amphiphilic co-polymers were developed that transfer drug compounds or DNA/RNA fragments into living cells

The project team developed and synthesized amphiphilic co-polymers, which are partly hydrophobic (non-water soluble) and partly hydrophilic (water soluble). The project team has successfully formulated several types of amphiphilic co-polymers that work with either drug compounds or DNA/RNA fragments. Currently, the project participants are looking for industrial partners to develop these co-polymers into commercial products.



Pictures of human breast cancer cells incubated with fluorescence labeled DNA. In the absence of co-polymers (a) DNA hardly penetrates into the cells. However, in the presence of positively charged co-polymers DNA penetration into the cells is significantly increased (b).

Pandemic Flu Threat Reduction

Outbreaks of influenza in animals, especially if occurring simultaneously with annual outbreaks of seasonal influenza in humans, increase the chances of a pandemic through the merging of animal and human influenza viruses. During the last few years, the world has faced several threats with pandemic potential, making the occurrence of the next pandemic only a matter of time.

In this situation, improved surveillance and rapid, precise diagnostics of circulating influenza strains are of critical importance.

Project # 3070 is funded by the US Department of Health and Human Services. Its main goal is to strengthen influenza surveillance in Russia as a fully integrated part of a global surveillance system. This will improve Russia's ability to monitor and respond to annual epidemics of influenza. The improvement of the influenza surveillance system will also lead to better pandemic preparedness for control of a pandemic virus that could arise naturally or as the result of a bioterrorist attack.

The aim of the project is the integration and timely analysis of virologic and epidemiological surveillance data. Virus isolation, typing, and testing for rimantadine resistance is performed as part of the surveillance efforts, combined with the collection of morbidity data on flu-like illnesses. Analysis of all data will be combined to determine if early recognition of influenza activity can be improved by integration of rapid diagnostic tests (RDT), virus isolation (VI) results, and epidemiological surveillance system data (based on registration and analysis of morbidity data).

Significant improvements of epidemiological surveillance and laboratory diagnosis of influenza were noted in the network of 14 regional laboratories headed by **Research Institute of Influenza, St Petersburg**. As a result of project implementation, virus isolation and identification were enhanced 2.8 times in comparison with the season 2004-2005. More than 8,000 clinical samples were investigated per year to determine the resistance to antivirals.

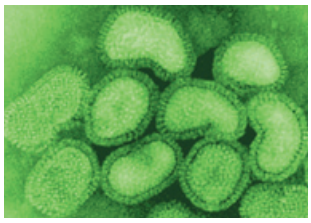
Outcome:
Presentation of influenza isolates to WHO Coordination Center (CDC, Atlanta, Ga) contributed significantly to the global influenza surveillance system. Computer based e-mail system of data reporting was installed for weekly communication between 14 regional Russian laboratories, Federal Influenza Center (St-Petersburg) and WHO on a weekly basis. A new method was developed and introduced to specifically determine the influenza A (H5N1) virus

Technologies for Detecting an Emerging Pandemic Influenza Virus

The US Department of Health and Human Services funded **project # 3803** at the **Institute of Chemical Biology and Fundamental Medicine, Novosibirsk**. The project is to create a microchip that can distinguish Influenza A viruses from different sources and of different genotypes. There are signature patterns in nucleotide sequences that can identify hemagglutinin and neiraminidase serotypes, discriminate within each serotype, and distinguish human, bird, swine, and other types of flu. Traditionally genotyping is done by either serology or by nucleotide sequencing.

The project team proposed a rapid method suitable for high-throughput implementation that could potentially provide the same information, but in a shorter timeframe and cheaper than conventional methods. The microchip will include several hundred oligonucleotide probes that will be hybridized with genetic material of selected influenza viruses. The results will be analyzed by a special pattern-recognition algorithm to provide an automatic identification. The probe design is one of the crucial elements of the project, and it is assisted by special software that has been created at the **Institute of Chemical Biology and Fundamental Medicine, Novosibirsk** in tandem with other ISTC projects.

The method will be used to screen for anticipated pandemic flu, rapid identification of naturally occurring reassortants, including those with viruses of other species, and screening viruses prepared for vaccine production. It could provide a rapid snapshot of the complete genetic composition of multiple strains.



Influenza A virus

Outcome:
Plans are to adopt the microarray developed under this project for the primary characterization of influenza viruses circulating in the Russian Federation

Avian Influenza (Bird Flu) Prevention

Influenza is a common and easily transmitted illness that has a worldwide impact in terms of the drastic number of deaths and the economic impact that sickness plays in the workplace.

The US BioIndustry Initiative (BII) works through the ISTC on Avian Influenza prevention projects. The goal is to monitor the transmission of Influenza A virus in Siberia. ISTC Project participants from the **State Research Center for Virology and Biotechnology (Vector), Novosibirsk**, together with international collaborators from the USA, have undertaken two successful research expeditions to Yakutia in 2007 and Kamchatka in 2008, during which scientists took samples and monitored the migration patterns of wild birds.

Data from this project, scheduled for completion in 2009, will be used both for vaccine development and to provide a more complete epidemiological picture of Avian Influenza for international organizations like the World Health Organization (WHO).

Such monitoring is vital for public health not only for Russia, but also for neighboring Asian countries, such as Mongolia and China, as well as Alaska, USA.

Three other partner projects funded by the **Agricultural Research Service of the US Department of Agriculture (ARS/USDA)** are also devoted to Avian Influenza prevention and examination of biological, immunological and genetic properties of influenza virus isolates, their pathogenicity as well as of transformation of influenza virus receptors.

For example, in 2008, a successful expedition to Wrangel Island in the Arctic Ocean obtained samples from the migratory snow goose and undertook laboratory research in the framework of **project # 3005 'Detection of Newly Emerged Newcastle Disease and Avian Influenza' by the Federal Center for Animal Health, Vladimir, Russia**. This expedition was only possible with the assistance of ISTC because Wrangel Island, where these rare species of goose are found, is a closed territory of the Russian National Park. The snow goose has unique characteristics for the indication of any pathological viruses including the viruses' intercontinental migration, which is critical for conducting research and methods of prevention of Avian Influenza as well as other dangerous viruses.

In 2009, the U.S. Department of Agriculture Agricultural Research Service Office of International Research Programs (ARS-OIRP) will fund a new collaborative research project with Russia and via ISTC to learn more about the basic virology of influenza A viruses and the role of swine in the ecology of these viruses (**project # 3940**).

Snow geese surveys on Wrangel Island

Outcome:
Avian Influenza samples collected and analyzed to assist in global monitoring of the virus

Prevention of Tuberculosis (TB)

Mycobacterium tuberculosis (TB), Multi-Drug Resistant (MDR), and Extremely Drug Resistant (XDR) Tuberculosis are among the most significant health threats facing Russia and the CIS. In accordance with USAID statistics, Russia ranks 12th among the world's 22 countries with a high tuberculosis burden. After years of gradual decline, TB incidence doubled during the 1990s but has remained constant since 2000. More than 117,000 Russians contract tuberculoses and about 25,000 die from tuberculoses disease every year, and these figures are up to eight times higher than European norms, the Federal Consumer Protection Service stated on March 19, 2009 on World Tuberculoses day.

ISTC, in the framework of the **US Biotechnology Engagement Program (BTEP)**, funded by the US Department of Health and Human Services, supported 20 research projects investigating TB in Russia and other countries of the CIS since January 2000 for more than $4.5 million USD. These projects have improved infrastructure to detect and treat TB and also provided epidemiologic data that is helping to prevent the spread of drug resistant strains in Armenia, Georgia, Kazakhstan, Russia, and Ukraine.

The **Research Center for Tuberculosis (RCT) at the Research Institute for Physiopulmonology (RIPP) in Moscow, Russia** is carrying out TB trials for new medicine in the framework of **project # 2879**. Upgrades to the laboratory, the clinical, and computer infrastructure and enhancement of laboratory capacity for molecular genetics have been completed before TB trials were started. Trials will review and develop a TB treatment regimen that includes moxifloxacin in the initial, two-month phase of treatment for newly diagnosed patients with pulmonary tuberculosis; and provide data for registration of a new drug susceptibility test kit and implementation of a TB biochip in Russia.

Asymptomatic 35-year-old woman with tuberculosis. Chest radiograph shows single small lung nodule (arrow) in left upper lobe

Outcome:
Over 20 research projects carried out on tuberculosis, and upgrades to the research center in Moscow completed; TB trials are underway

Diagnosis of Tick-borne Diseases

At present, more than 850 tick species, the Invertebrate's type Arthropodes, class Arachnida, transmit bacteria, viruses, protozoa and fungi. Ixodid ticks transmit to humans a number of infectious diseases including tick-borne viral encephalitis (TBE) and tick-borne rickettsiosis, and Lyme disease – also known as Lyme tick-borne borreliosis.

Lyme borrelliosis is widely spread in Europe, in particular Scandinavia, South Sweden, Austria, Germany, and Slovenia, as well as in the United States. Mostly, the tick-borne borreliosis (B.garinii and B.afzelii) are located in Russia. Lyme disease has been registered in Russia since 1991, with official statistics showing up to 9 thousand morbidity cases.

Developing diagnostic methods for tick-borne diseases is critical for countries to ensure surveillance and proper assessment of the ecologic risk of these infections. The main goal of **ISTC partner project # 3135** funded by the Biotechnology Engagement Program of the US Department of Health and Human Services at the **State Research Institute of Biological Instrument-Making and JSC "Immunoscreen" in Moscow, Russia** is to develop a new diagnostic technology based on phosphorescence analysis (PHOSPHAN) for simultaneous detection of specific antigens and antibodies to the agents of several tick-borne infections, such as ixodid tick-borne borreliosis, tick-borne encephalitis and ehrlichiosis. The new diagnostic technology will be based on phosphorescence analysis – PHOSPHAN.

Ticks can transmit various diseases, some of which are lethal

Outcome:
This project will develop a complex of screening, seroepidemic and diagnostic investigations to decrease the risk of tick-borne infections in the population

Nanotechnologies for Use in Materials and Medicine

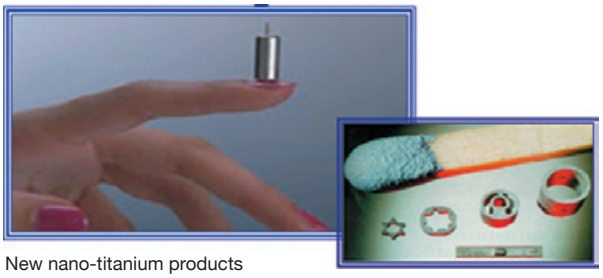
Over the last ten years, great interest has arisen in nanostructured materials, including those produced by severe plastic deformation (SPD) techniques based on microstructure refinement down to the nanometer range.

The technological advantages of SPD techniques, utilized in the production process, and developed by a group of scientists as a result of several ISTC projects at the **Russian Federal Nuclear Center - All-Russian Research Institute of Experimental Physics, Sarov, and Ufa State Aviation Technical University (USATU)**, are the ability to produce bulk nanostructured metallic materials (NSM) in the quantity and quality required for structural applications in machine building, the automotive and aerospace industries, as well as in medicine and medical engineering.

The technology is a nano-materials development and production technique for pure titanium, aluminum, steel and other materials. For pure titanium, the 2-step process significantly increases the strength compared to alloys such as Ti-6Al-4V. The Nano-Ti also possesses similar ductility and biocompability, as well as superior corrosion resistance, as pure titanium.

An ISTC Innovation Initiative (**II # 070**) helped to fund the establishment of pilot production in Ufa and Sarov of articles and semi-products of various kinds from commercially pure Ti with an ultrafine-grained nanostructure and enhanced properties. The material is intended for practical applications as structural elements in medical products, such as dental and body implants. The start of production is planned for Autumn 2009. Mechanical and other properties, such as corrosion and wear resistance have been improved as a result of the formation of nano structures using SPD techniques. A number of toxicological studies have proved their biological compatibility with human tissue.

Nano-titanium products may be used in medical and dental implant markets. Advanced materials with improved biocompatibility and the ability to custom produce them are creating a variety of new innovations in the $42 billion USD medical device market. Numerous additional markets exist for many metals, including the automobile industry (clutches, brakes, wheels) and aeronautics (engines, seat tracks, turbines, machinery).



New nano-titanium products

Outcome:
Development and testing of new nanomaterials for use in the medical and commercial industries

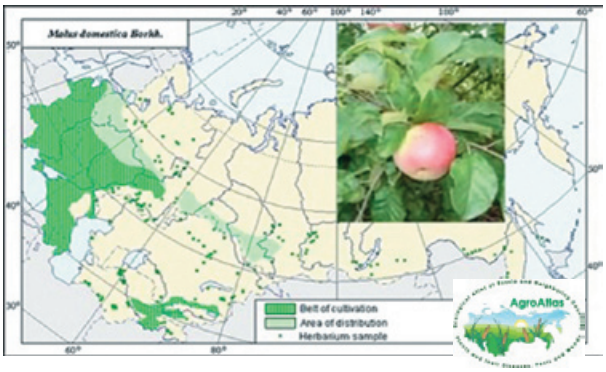
CIS Interactive Agricultural Atlas

An important component of food security and the further development of the agricultural industry is ready access to information on economic plants, their associated pests and the environmental factors that shape the agricultural landscape of a country. This information is useful to farmers, students, agricultural specialists, and policy-makers. Easily-used geographic information system (GIS) tools allow maps and information to be assembled and placed in a framework that can be easily viewed, analyzed and used by a wide audience.

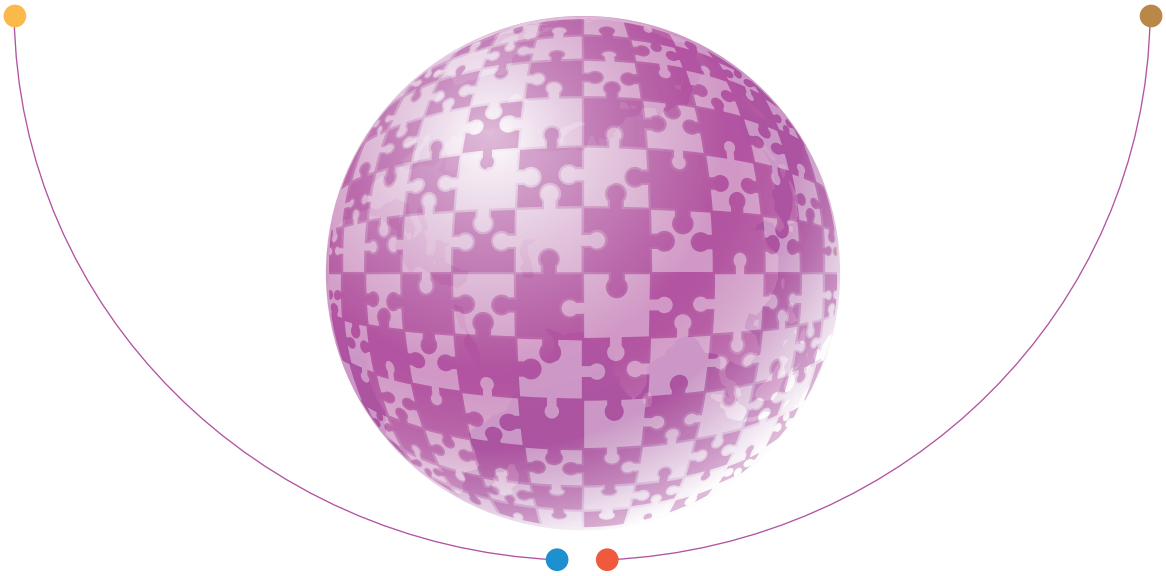
The Ecological Atlas of Russia and Neighboring Countries (AgroAtlas) www.agroatlas.ru/en brings together information on the geographic distribution and biology of 100 crop plants, 560 wild relative species, and 636 species of diseases, pests and weeds that impact crop production. In addition, the AgroAtlas provides maps on 200 agroecological conditions that impact crop production. Maps and GIS tools allow users to combine this information to answer important questions relevant to developing sustainable food production across the entire area of Russia and the CIS.

Development of the AgroAtlas began in 2003. Three Russian and one U.S. Government agency are collaborating on the Atlas through ISTC. The **Geography Department of the Saint-Petersburg State University** is the lead institute, preparing environmental maps, developing the GIS software, and coordinating the overall project. The **N.I. Vavilov Institute of Plant Industry** is preparing maps illustrating where crops have been historically grown, and distribution maps for wild crop relatives.

The **All-Russian Institute of Plant Protection** is preparing maps showing the historic distribution of plant diseases, insect pests and weeds that impact agricultural production. Over 65 scientists from three major Russian institutions along with United States Department of Agriculture – Agricultural Research Service (USDA/ARS) scientists are closely collaborating on this project, which is being funded by the USDA /ARS Office of International Research Programs and managed by ISTC.



Outcome:
A freely-available comprehensive reference guide to economic plants and pests which defines agro-ecological conditions across Russia and the CIS, coupled with an easy-to-use GIS tool which provides the capacity for interactive spatial analysis



Sustainable Nuclear Energy with Enhanced Safeguards, Safety and Security

Worldwide demand for energy will continue to increase rapidly and could double by 2050 with a possible doubling of electricity consumption by 2030. At the same time, evidence shows that CO_2 and other greenhouse gases emissions must be reduced globally. Abundant, affordable, and environmentally friendly energy must be developed to meet demand and to mitigate environmental and climate threats. Safe nuclear energy production is one of the priority areas for development and an increasing use of the term 'nuclear renaissance' signifies the reemergence of nuclear technologies as one of the solutions to present and future energy supply needs.

The government of the Russian Federation is presently actively involved in the development of a safe nuclear energy sector. In 2008, ISTC undertook a review of all projects in the nuclear field since ISTC inception in 1994. Results showed that ISTC has consistently supported projects addressing key topics in nuclear technology, in particular:

- Nuclear safety and efficiency of operating Nuclear Power Plants (NPPs)
- Novel reactor concepts and Nuclear Fuel Cycle options
- Nuclear material accounting and control
- Computer and experimental modeling
- Nuclear data measurements and accounting
- Knowledge preservation/management in nuclear science
- NPP decommissioning
- Nuclear technologies for medicine
- Fusion

ISTC has achieved particular success in projects other than nuclear power, such as:

- High Energy Physics in which ISTC facilitated extremely successful cooperation of Sarov and Snezhinsk with CERN with over 40 projects funded, for nearly $30 million USD
- Development of the Large Hadron Collider ("big bang" project); ISTC projects with CERN generated over $100 million USD bilateral or commercial contracts between CERN and Russian (including RosAtom) institutes
- In fusion research, ISTC has funded projects preparing the ground for Russian participation in the International Thermonuclear Experimental Reactor (ITER) and in supporting alternatives to ITER fusion concepts
- Nuclear reactor concepts (on-board and propulsion units) for deep space exploration, in particular a manned mission to Mars
- ISTC has actively supported nuclear knowledge management

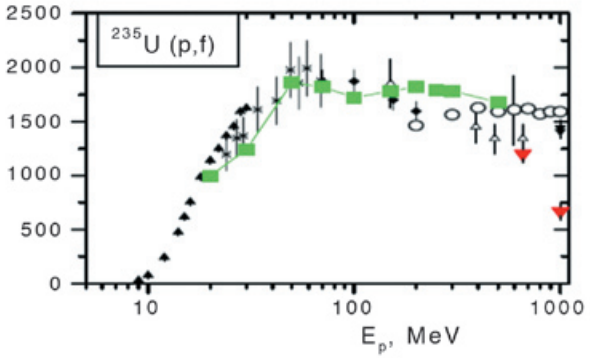
ISTC has also placed a priority focus on projects related to medicinal uses of nuclear technology. For example, ISTC has supported a number of projects leading to improved treatment and diagnostics, particularly in the treatment of cancer.

Reliable Nuclear Cross Section Data – a Key Component of Safe Nuclear Power

Nuclear cross section libraries contain a vast amount of data and must be updated continuously. Reliable nuclear data libraries are necessary for the design and safe operation of nuclear installations. The **Khlopin Radium Institute in St Petersburg, Russia** is one of the institutes supplying the world research community with such nuclear data.

In the framework of **project # 2524**, funded by the US, a new computer code system, MCFx has been developed in order to simulate the main features of nucleon-induced reactions with heavy nuclei using the newest nuclear data libraries. The nuclear data generator, MCFx, is based on modern reliable nuclear models and satisfies the main design requirements. New nuclear cross section data has been created for 9 nuclei: 208Pb, 209Bi, 232Th, 235U, 238U, 237Np, 239Pu, 241Am, 243Cm. Those new data files were verified by the International Atomic Energy Agency (IAEA) nuclear data sections and included into new nuclear data libraries available for the international nuclear community.

Project # 3751, also at the **Khlopin Radium Institute** addresses the problem of nuclear data for fission product yields (FPY) in high energy fission. These data are used for estimations of fission product inventory in the neutron-generating target and subcritical assembly, criticality calculations and decay heat calculations.
The results of these two projects allow extending ENDF and JEFF nuclear data libraries up to 1000 MeV. This improvement is essential for the design of advanced nuclear systems like Accelerator driven systems for transmutation and spallation neutron sources.



Cross section for proton induced fission of U-235. The Green squares correspond to ISTC project measurements, other symbols represent available data from earlier experiments.

Outcome:
Development of a new computer code and database

Prevention of Severe Nuclear Accidents

There are a number of ISTC projects related to the principal aspects of severe accidents, namely: investigations into the destruction of fuel elements (particularly because of quench cooling), creation and behavior of melt corium, corium parameterization (particularly for Chernobyl lava), hydrogen ignition, and barriers against accident aftermaths (catcher, walls, containment).

Since 2002, a group of relevant ISTC projects has been coordinated by the international Contact Expert Group CEG-SAM (Severe Accident Management), initiated by the European Commission. Regular meetings of the CEG-SAM include EC officials, experts from different European institutions, companies, universities and other organizations, involved in accident management.

Projects reviewed by CEG-SAM include 'processes in the fuel melt (corium)' **#K1265, #3592, #3813, #3831, Partner projects #3078-P and #3837-P. Research is carried out at Research Institute of Technology (NITI, Sosnovy Bor), Nuclear Safety Institute of Russian Academy of Sciences (IBRAE, Moscow), S-P Atomenergoproect (S-P AEP, St-Petersburg), and Institute of Atomic Energy (IAE) of the National Nuclear Center of Kazakhstan, universities.**

These projects were designed to improve the accuracy for modeling of melt formation and thermodynamics of corium behavior inside the reactor vessel. Several original methods were developed and used in the experiments, for instance: the induction melting corium cold crucible, the indirect method of induction heating graphite heaters to conduct research with a mass of the melt from 2 to 100 kg, and others. Detailed mathematical models and computer codes were developed for processes in the systems corium – limiting barrier.

Projects #1648.2, #2936 and #3345, completed in 2008, and on-going #3690, executors – Research Institute of Atomic Reactors (NIIAR, Dimitrovgrad), NPO LUCH and NPO GIDROPRESS (Podolsk), Nuclear Safety Institute of Russian Academy of Sciences (IBRAE) and MEI-TU (Moscow).

A complex large-scale experimental study of VVER FA destruction after quench was conducted on the installation PARAMETER (**# 2936**, NPO LUCH, Russia) and on the European installation QUENCH (FZK, Karlsruhe), accompanied by supporting small-scale experiments with single fuel elements irradiated up to high burn-up in Research Institute of Atomic Reactors (RIAR, Dimitrovgrad, Russia).

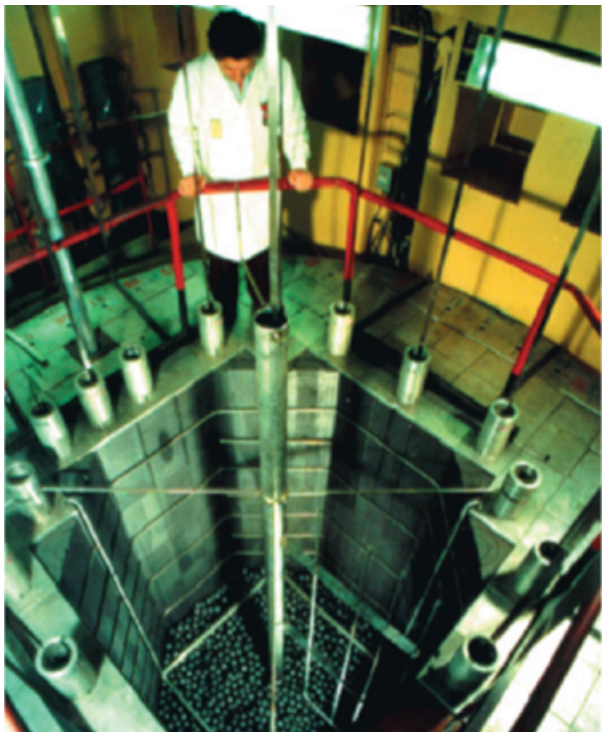
On the basis of experimental data, the SA models were improved and the Russian computer code SOKRAT (IBRAE RAS) and proper European codes were improved and verified. Russian specialists had the opportunity to test simulators of domestic fuel elements at the FZK installation QUENCH, as well as to have access to a data-base of other experiments conducted at this installation for the past 10 years.

Outcome:
The creation of high-quality databases and tooling for designing of technical barriers and modeling of destruction of fuel rods and fuel assembly, and reactor pressure vessel state under severe accidents

Advanced Nuclear Data for the International Bank for Critical Experiments

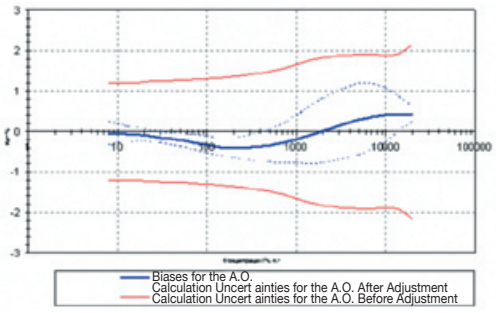
Nuclear reactor safety is based on verification of models, computer codes and nuclear data by special 'benchmark' experiments on critical research installations. Some of these activities are coordinated by nuclear energy authorities in France and the US and by the IAEA in Vienna through the International Handbook of Evaluated Criticality Safety Benchmark Experiments (ICSBEP) project. Four ISTC projects closely fit with the ICSBEP and take place in the Russian nuclear institutes at **IPPE, Obninsk, (Projects # 0815-P, #0815.2, #3579-p) and at VNIITF, Snezhinsk (ISTC project #3110-p).**

The projects offer improvements to nuclear safety through an analysis and minimization of uncertainty and errors in the methods, nuclear data and computer codes used in the calculations of nuclear reactor systems with fast and thermal neutron spectrum. Analyses were made using a large number of experiments (totaling more than one hundred) with low-enriched and highly-enriched uranium at the BFS-family critical installations in Institute of Physics and Power Engineering named after A.I. Leypunsky (IPPE) and All Russian Research Institute of Technical Physics (VNIITF).

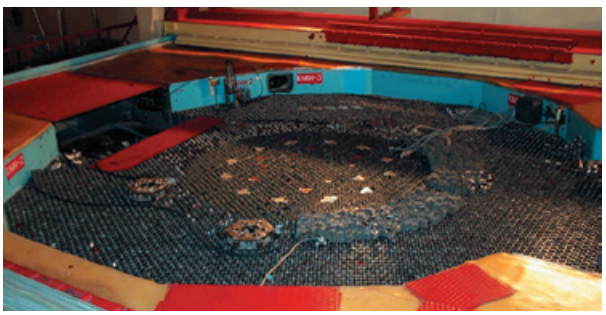


ASTRA critical installation for HTGR modeling (Kurchatov KIAE)

Another set of critical experiments was started at the ASTRA critical installation at the RRC Kurchatov Institute, Moscow within the framework of **project #0685.2. ASTRA** is a unique cooled graphite research reactor with a core, which may be heated up to 500°C. Verification of safety parameters of High-Temperature Gas-Cooled Reactor (HTGR), using different zone configurations and conditions will be a key outcome of the project work.



Uncertainties and biases of keff values before and after adjustment for systems of application area with plutonium fuel using vector of calculation-experimental discrepancies calculated using ABBN neutron cross-sections and ENDF/B-V covariance matrix.



The Big Physical Facility – BFS (Institute of Physics and Power Engineering named after A.I. Leypunsky – IPPE)

Outcome:
Integration of Russian Key Nuclear Institutes into international cooperative work on nuclear safety benchmarking

Experimental Study of Molten Salt Reactor Fuels

One of the types of reactors foreseen in the frame of a Nuclear Renaissance is the molten salt type.

Project # 1606 was performed in close cooperation with European research projects of EU funding programs (FP5/FP6): MOST 'Review of Molten Salt Reactor Technology' and LICORN, coordinating efforts of the EU countries involved. Particularly, a wide spectrum of experimental data corresponding to the MOSART (Molten Salt Actinide Recycler & Transmuter) concept was obtained. The project results correspond to the Generation IV Forum (GIF) program (international program focused on in-depth study of advanced nuclear concepts).

A loop with molten salt and measuring system was designed by participating institutes: **All Russian Research Institute of Technical Physics (VNIITF, Snezhinsk), Russian Research Center "Kurchatov Institute" (Moscow), High Temperature Electrochemistry Institute (Ekaterinburg), and VNIIKhT – Chemical Technology Institute, (Moscow)**. The loop was manufactured and assembled at VNIITF, Snezhinsk. Experiments were carried out with salt masses of more than 100 kg.

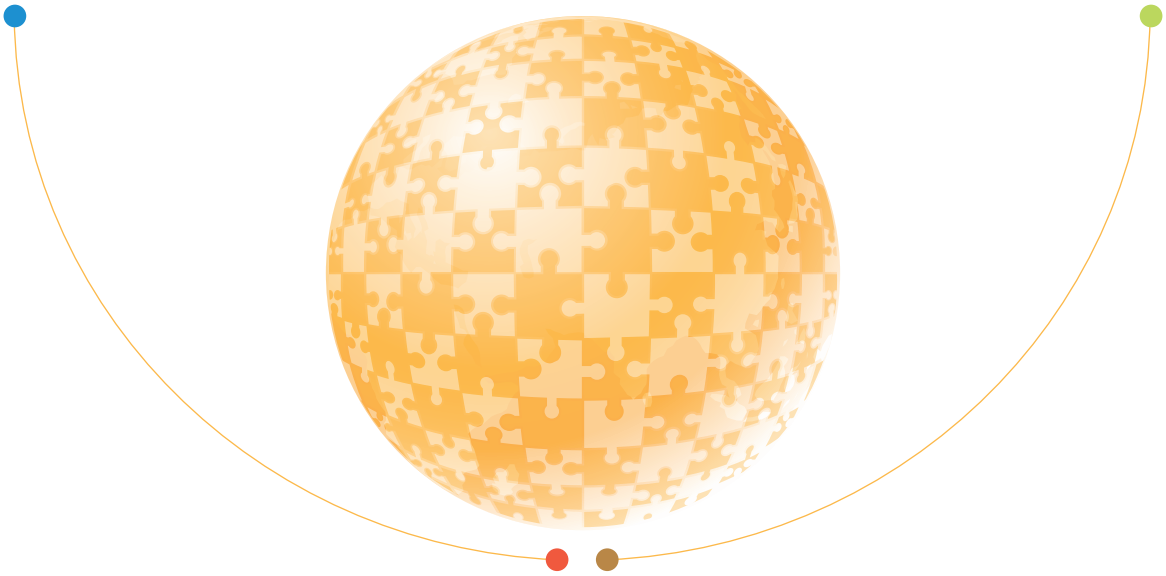
The participants of the project were involved in the IAEA Coordinated Research Project (CRP) 'Studies of Reactor Technology Options for Effective Incineration of Radioactive Waste'.

The features of molten salts based on chlorides, the other candidate for liquid fuels for Minor Actinides transmutation, were studied by Research Institute of Atomic Reactors (NIIAR, Dimitrovgrad) in the frame of **project # 3261** 'Study of Curium Thermodynamics in Molten Chlorides'.
Recognizing the importance of international cooperation in this field, ISTC organized special technical training sessions devoted to 'Modern experimental and analytical methods for study of actinide-containing molten salt properties'. The sessions were held at VNIITF, Snezhinsk, NIIAR (Dimitrovgrad), later in CEA (Centre d'Etudes Nucléaries, Cadarache) and in CIEMAT (Centro de Investigaciones Energeticas Medioambientales y Tecnologicas, Madrid). Experts from CEA, EdF (France), Ciemat (Spain) and JRS ITU (Germany) gave lectures and special training for the Russian project recipients.

The collaborators evaluated the project results highly, noting: "The discovery and verification of molten flibe as carrier of sufficient TRUs in the MOSART reactor design has been of much worldwide benefit".

The logical continuation of this molten salt program is **project # 3749**, focused on experimental studies of fundamental properties of advanced molten salt compositions and structural materials for the thorium-uranium fuel cycle. The project, funded by the EU, is being implemented in close collaboration with a number of other EU funding research programs.

Outcome:
Contribution to international cooperation to develop the next generation of nuclear reactors



Environmental Remediation and Climate Change Mitigation

In today's industrialized world, a wide variety of contaminants are released to the environment from residential, commercial and industrial sources. Many of these releases contain contaminant/hazardous substances that have the potential to impact human health or the environment notably by affecting the climate. ISTC projects tackle environmental problems, such as remediation of pesticide stockpiles or upgrade of coal-fired power plants, as well as international issues that are trans boundary, like the monitoring of various air pollutants.
In particular, ISTC projects cover:

- Clean soil
- Clean Water
- Clean Air
- Mitigation of Climate Change

Initially, ISTC projects addressed the growing concerns of irreversible and damaging changes in Earth climate and environment through the development of various technologies. However, ISTC has broadened its scope of activities to include training of environmental consultants in order to meet various international standards and agreements. Currently, European and US environmental consultants provide the majority of the technical consulting for these projects in Russia and the CIS. The addition of such expertise will be an important asset for Russia and CIS countries in terms of future job creation and integration of scientists into the international community.

Environmental projects make up the second highest number of ISTC's past and present project funding and collaborations. In 2008, funding for environmental remediation and climate change mitigation reached $74 million USD on over 200 projects.

Predicting Ecotoxicity through Computer Modeling

With growing industrialization and globalization, the number of man-made chemicals grows expontentially, and in parallel, so does the burden of eco-pollutants that are incidentally released or escape from confinement. Of ever-growing importance is the need to identify the level of toxicity in proposed new substances, and to assess the benefits versus the hazards before launching into projects to pursue these new substances. This is the aim of the field of ecotoxicity.

Project # 0888, with financial support from the United States and carried out by the environmental and computer modeling scientists at the **Institute of Physiologically Active Compounds (IPAC) in Chernogolovka, Russia**, involves the creation of a commercially available program package for computer-aided prediction of ecotoxicity. The ecotoxicity of a chemical compound can be quantitatively characterized by means of a set of tests which include toxicity to any environmental recipient, the ability of chemicals to biodegrade, solubility in water, vapor pressure, partition in water-air and water-solvent systems, permeability through different biological membranes, and action of the compounds on plants, fish and animals. Models of the structure of chemical compounds allow prediction of the toxicity to environmetnal recipients.

In the framework of the project, the stable predictable Quantitative Structural-Activity Relationship (QSAR) models of new-type pollutant ecotoxicity for diverse organic chemicals was obtained and published for toxicity of pollutants to a range of aquatic life.

Outcome:
Predictive models of toxicity were verified, based on aquatic life, and a follow-on **project # 3777** was funded by the EU in 2008. This new project will apply the techniques perfected on the aquatic models, to rodents, with application to food safety

Soil Remediation of Land Contaminated by Weed Killers

Developing countries and those in transition often need to manage the legacy of old facilities where development of industrial capacity has left sites contaminated with poisonous or toxic precursor reagents or products. Those involving organophosphorous compounds are of especially high hazard, and this can include pesticides or even warfare agents.

In previous times, regulations on management of hazardous materials or chemicals during production, storage, or disposal was not as stringent or strict as they are today. Contaminants in soils and waterways (silts) pose great hazards to the environment and public health. Existing technologies for treatment of contaminated sites involving physico-chemical methods are expensive, and have deleterious effects on the soil or silts in the effort to eliminate the original problem. There is a great need to develop technologies that are low cost, flexible and easy in application, and with low environmental impact on the site.

Scientists at the **Research Center of Toxicology and Hygienic Regulation of Biopreparations (Serpukhov, Russia)** and the **Institute of Biochemistry and Physiology of Microorganisms (Puschino, Russia)** have developed such a technology under **project # 1892.2**. The project team developed a bioremediation methodology that can be applied to soils that are contaminated by phosphor-organic compounds (POC).

The participants isolated various bacterial strains, from different areas in Russia, which actively decompose different kinds of POCs. Based on various criteria (such as activity of POC decomposition, stability under storage conditions, and requirements for cultivation conditions) the most promising strains were selected and studied in order to develop a protocol of bioremediation.

One strain which showed the most potential was field-tested on a small scale in soil contaminated by glyphosate, a non-selective herbicide. After the field trials, the toxicity level of the soil was reduced to acceptable levels. Additionally, the bioremediation of the contaminated sites restored and stimulated the overall microflora composition of soil, an additional benefit which other remediation methods lack. The project team is now looking for commercial partners to market the new bioremediation technology.


Test area outside of Moscow, Russia


Preparing the soil


Soil sampling for analysis.


Introduction of “strains-degraders” microbial suspension in soil.

Outcome:
Microbial bioremediation of soils contaminated by phosphorus organic compounds

Cleaner Emissions from Coal-Fired Power Plants

Particulate matter, also known as fine particles or particle pollution, emitted by coal-fired power stations is deemed a serious air pollution problem in Russia. Studies have shown that exposure to high levels of particulate matter is related to an increase of respiratory and cardiac mortality. Particulate matter can irritate small airways in the lungs, which can lead to increased problems with asthma, chronic bronchitis, and airway obstruction. The issue has become a global concern, and measures to reduce the amount of these particles are currently under development.

In order to address this problem and its impact on human health, a team of scientists from the **Institute of Organic Chemistry in Moscow**, supported by the **All-Russia Thermal Engineering Institute Moscow** designed a more efficient 'wet scrubber' to absorb particles ejected from coal power plants. **Project # 3407** was funded by the US Environmental Protection Agency.

Wet scrubbers are designed to collect particulate matter and/or gaseous pollutants. They remove dust particles by capturing them in liquid droplets, but the scrubbers used in Russia are in many cases below optimal operational levels, and often fail to meet requirements regarding harmful emissions.

The project was completed in 2008, with research showing that adding chemical oxidants sharply increased the efficiency of fine particle capture from flue gases. Moreover, if water spray flow is raised threefold in comparison with conventional methods; particle emissions are reduced more than ten times. Particulate matter can travel a great distance in the atmosphere, so the problem is really trans-boundary and global. The new improved wet scrubber offers a practical solution to this type of air pollution in Russia and in neighboring countries.

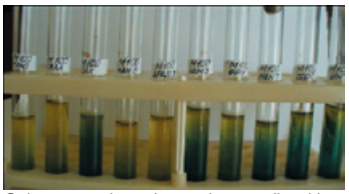
Outcome:
Design of an anti-air pollution device for use in coal-fired power plants

Protecting the Environment from Pesticide Burial Site Releases

The contamination of water supplies and soils due to inadequate disposal of obsolete or deteriorated pesticides is a widespread problem in many former Soviet communities. While a major difficulty involves actually locating the pesticide burial site, the issues and costs to remove the danger of contamination may be considerable. Removal or elimination of the contaminants is required in order to return the soil to its original fertile condition for further use for agriculture or other development by the local community.

Personnel at the **Research and Production Center for Environmental Monitoring «RACEM» Ltd., in Kirov, Russia**, have identified several naturally occurring microbiological species that can use particular pesticide contaminants in soil as food sources, thereby digesting and eliminating the contamination. Additionally, bioremediation of the contaminated sites restored and stimulated the overall microflora composition of soil, an additional benefit which other remediation methods lack. This work was performed under **project # 3507**, funded by Canada.

In addition, on completion of this and other related projects, RACEM was provided with modern analytical lab equipment, materials, and certified personnel to enable them to carry out environmental monitoring in the Kirov region and anywhere else in Russia, and to establish an accredited analytical lab capable of providing analytical services according to the US Environmental Protection Agency (EPA) and International (ISO) Standards.



Culture growth on the nutrient media with different sugars

Outcome:
Microbial bioremediation methods for soils contaminated by pesticide compounds have been developed for practical use. Project personnel are in communication with environmental organizations

Ensuring Greener Air Transport

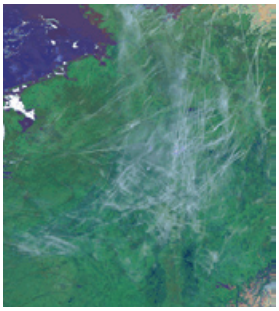
Global climate change is a worldwide issue with aviation activity adding to the burden of pollution. To date, the focus has been on reducing atmospheric pollutants of carbon and nitrogen oxides (CO, CO_2 and NOx), by improving the fuel efficiency of planes or developing new, cleaner fuels.

However, aviation also causes other effects in the atmosphere such as condensation traces (contrails) and affecting (cirrus) cloud formation, which play a key role in the radiation balance of heat exchange between the atmosphere and the earth's surface.

Contrails are formed as a result of condensation and freezing of the water steam contained in jet exhausts. Formation of aircraft condensation traces is a complicated physical and chemical process, which depends on many factors, such as the type of aircraft and engines, the type of fuel used, and the characteristics of the atmosphere. Therefore, there is a great need within the aviation industry to have a better understanding of contrail formation in order to formulate strategies to reduce them.

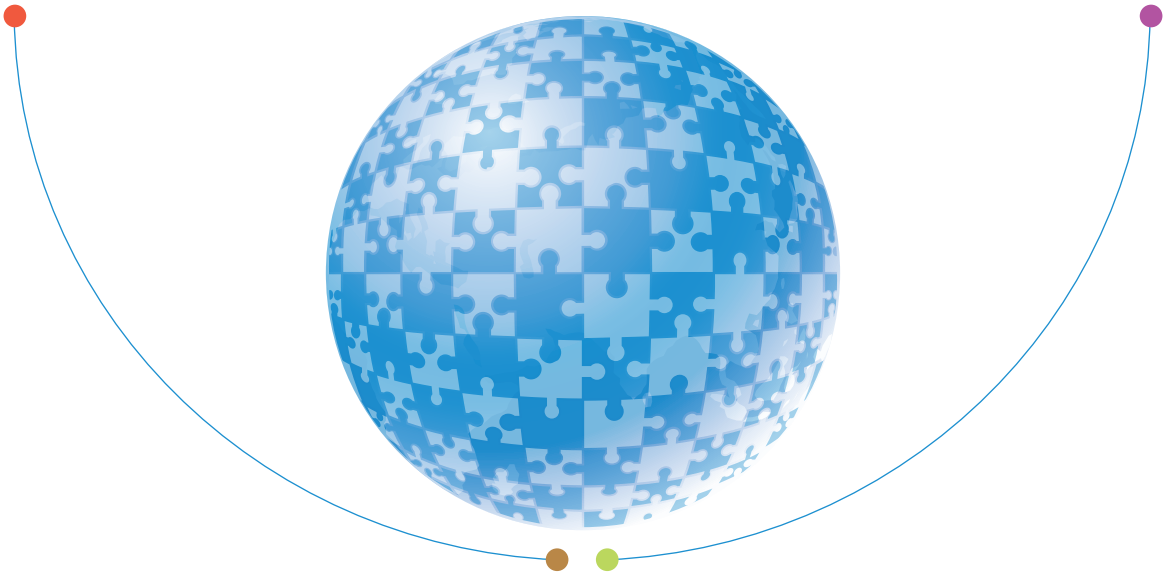
As part of **project # 3907**, scientists from the **Gromov Flight Research Institute (Moscow, Russia)** in cooperation with experts from **AIRBUS and the European Project AERONET III (and the assistance from experts of the Central Institute of Aviation Motors, Central Aerological Observatory, Moscow State University, Skobeltsin Institute of Nuclear Physics and Moscow Institute of Physics and Technology)** developed a quantitative forecasting model of contrail formation for various airplanes with gas-turbine engines in a variety of conditions. The model was tested with a series of flight experiments using a flying laboratory on the base of a Russian Tupolev Tu-154 aircraft. Project participants are now planning further development and testing of the contrail formation model to assist with the design of 'greener' aircraft.

Aircraft condensation trails (contrails)



Contrails over Central Europe (photo from cosmos)

Outcome:
A unique, quantitative model for forecasting and estimating aircraft contrail formation conditions and the reduction of aviation impacts on the global climate



Renewable and Environmentally Friendly Energy Technologies

(non nuclear energy technologies)

The field of Renewable Energy is of interest for ISTC for a number of reasons:

- It addresses one of the core missions of ISTC: To contribute to the solution of national or international technical problems; …in the fields of environmental protection and energy production.
- There is a global commercial imperative to develop such technologies
- Russia, Georgia and some of the CIS countries are very rich in fossil fuels, ISTC may play an important role in stimulating activities in this field
- Regional governments are willing to collaborate and to co-fund projects in renewable and bioenergy

In the context of rapidly growing climate concerns, ISTC can play an important triggering and incubating role in the field of new non nuclear or traditional energy technologies. There is commercial potential with already existing technology in renewable energy technologies and broad sustainability perspectives in the relatively near future.

ISTC places particular focus in the following areas:

- Fuel Cells and Hydrogen Systems (Hydrogen Economy), complementary to the existing Fuel Cell Targeted Initiative (ISTC has received more than $1.5 million USD in funding from Parties to date and is achieving notable sustainable scientific results)
- Bioenergy
- Environmental friendly Fossil Energy (Clean Coal)

Developing Cleaner Forms of Energy

ISTC's Fuel Cell Targeted Initiative

Russia's vast resources of natural gas, oil and coal are acting as a driving force in the development of clean energy technologies as governmental and public concerns over climate change and future energy production become evermore pressing. 'Associated' gas – a by-product of oil and natural gas production, with billions of cubic meters produced every year, is now being used for clean energy production once the gas is reformed into hydrogen.

To better understand the nature of support that ISTC could provide in this field, a review to assess Russian developments in the hydrogen energy sector took place in 2002. During the Soviet era, Russia had tested one of the world's first fuel-cell powered vehicles. The Russian Energy Ministry, Rosatom, had also been working on alkaline, molten carbonate, solid oxide and solid polymer fuel cells for a considerable period. With the breakup of the Soviet Union, scientific teams involved in hydrogen energy development experienced significant funding challenges and ISTC support in the early and mid 1990's helped to maintain their research capabilities.

Following the review, ISTC established the '**Fuel Cell Targeted Initiative**', co-funded by Canada, the EU and US, to support and encourage technologies related to fuel cell and hydrogen energy development and production. Currently, there are several programs underway in Russia on clean energy production, including hydrogen generation and storage, as well as fuel cells and hydrogen engines in which major companies including the largest Russian energy company, Gazprom, are already participating.

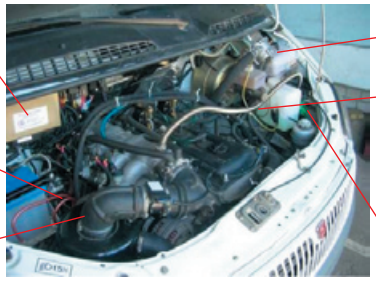
Research carried out by the Russian Institutes engaged in ISTC's Targeted Initiative; the **All-Russian Research Institute of Experimental Physics (VNIIEF, Sarov); the Boreskov Institute of Catalysis (Novosibirsk); and, the Karpov Research Institute (Moscow)**, has enabled the creation of a wide range of new technologies and fuel cell units. In particular, following a request from Gazprom to develop the use of natural gas as a primary fuel, a three-stage hydrogen generation option has been selected which provides adequate hydrogen quality for the development of new and cost-effective fuel cells.

The Fuel Cell Targeted Initiative has now reached its final stage and its key product, a prototype of a hydrogen-operated power plant of 5 kWt capacity, will be installed at a Gazprom site for field tests late in 2009. Based on test results, some modifications to the plant will be made, and in 2010, the lead scientific institution, VNIIEF in the closed nuclear Russian city of Sarov, will launch serial production of the new power plant. Gazprom has confirmed it will act as the key financial investor.

Another of the most promising areas of research is to use hydrogen as an additive to the prime fuel in internal-combustion engines. This approach can significantly improve both the economic and environmental characteristics available to transportation vehicles. The Fuel Cell Initiative participants, outside the project framework, have developed some units for generating hydrogen-containing gas from almost any source fuel. The application of novel nano-structured catalytic systems and innovative structural concepts made it possible to design a simple and small-sized device for on-board hydrogen generation from the fuel consumed by a vehicle's own engine.

To date, the time it takes for the catalyst to start has been a delaying factor, but significant improvements have been developed by the Russian scientists. The catalyst can be warmed up from room to operating temperature level (600° C) in 10 seconds as opposed to 30 plus seconds with previous devices. When hydrogen-containing gas is added, an automobile becomes superior to Euro-4 Standard parameters and enables a saving of about 20% of fuel. Further projects expect to examine methods to neutralize the toxicity of powerful diesel engine emissions and to improve the ecological properties of gas turbines.

On-board syngas generator and engine operating components under engine cowling



Hydrogen Trapping and Release at Plasma and Ion Interaction with Solids

One of the potential solutions to the demand for alternative energy options is the ambitious technology of fusion reaction, i.e. recreating the processes that occur in a star in a controllable environment on earth. This alternative has received much international support and currently the world's first fusion reactor is being designed and planned to be built in Cadarshe, France.

A variety of scientific and technical problems still remain unresolved before construction can be started, with tritium safety as one of the most serious points of concern. Tritium can be both a reactant and a product of fusion reaction. As a hydrogen isotope, tritium has a high penetration ability that leads to its significant diffusion into and through reactor materials. This diffusion can lead to a change in the characteristics of reactor materials, which is a safety concern.

The extraordinary importance of this aspect of fusion was acknowledged by the International Atomic Energy Agency (IAEA) by initiating a Coordinative Research Project (CRP) on Tritium Inventory in Fusion Reactors. As a result, an internationally coordinated project, **project # 2805** was funded by the European Union and Japan to better understand how tritium behaves in fusion reactors in order to increase the safety of these kind of reactors.

Three Russian institutions (Moscow Engineering and Physics Institute, Russian Research Center 'Kurchatov Institute', and the Institute for Physical Chemistry of the Russian Academy of Sciences) worked closely together with researchers from Canada, the EU, Japan, and USA on the theoretical and practical aspects of this problem. As result of the project, there is a better fundamental understanding of the behavior of hydrogen and tritium in the environment of fusion reactors, which was not covered by existing theories. The project is a good example of two international organizations (ISTC and IAEA) working in partnership to develop alternative and safe energy solutions.

Participants at the IAEA and ISTC meeting

Outcome:
A greater understanding of the behavior of hydrogen and tritium in fusion reactors, which will result in safer design of these types of reactors

Development of Multi-Charged Ion Source for Applications in Modern Science

Multi-charged ion (MCI) sources, such as pulsed electron-cyclotron resonance (ECR), are widely used in various fields of modern science. Due to the increase in applications of MCI sources, there is also growing demand for sources with a higher intensity and high repetition rate. For example, the future accelerator of heavy ions in CERN requires a high current (several hundreds mA), short pulse durations (100 μs), and fast repetition rates of 1 Hz. These requirements are not achievable with traditional ECR sources of MCI.

Therefore, experimental and theoretical research was performed by the **Institute of Applied Physics – Russian Academy of Science (N. Novgorod, Russia)**, as part of **project # 2753**, which resulted in the design, development and construction of a new type of multi-charged ion source – gasdynamic ECR sources of ions (ReGIS).

This new approach makes it possible to generate a high current beam (more than 100 mA), containing mainly multi-charged ions. Additionally, special attention was given to the quality of the ion beam, using a special axisymmetrical configuration of the magnetic fields, which notedly improved the characteristics of the beams. The success of this project was a direct result of the collaboration between the proejct participants and scientists from CNRS-IN2P3/Universite Joseph Fourier (LPSC) (Grenoble, France) and GSI Helmholtz Centre for Heavy Ion Research GmbH (Darmshtadt, Germany).

There are now plans to develop an ion source for the accelerator in CERN with the purpose of research of neutrino, as well as a source for the accelerator in GSI Helmholtz Centre for Heavy Ion Research for investigation of materials in exterme conditions.

Depiction of the Large Hadron Collider

Outcome:
A new type of multi-charged ion source was developed that can be used in various fields of modern science

Development and Construction of Components for the Large Hadron Collider at CERN

High Energy Physics based on Advanced Accelerator Technology (also called Particle Physics) is attempting to answer fundamental questions about the Universe and its origin as well as the very structure of matter. Collaboration with the European Organization for Nuclear Research (CERN) in Geneva, Switzerland, GSI, DESY (Germany), US National Labs, JNC in Japan is one way to redirect former weapons scientists to work in fundamental, challenging and self-supporting science.

ISTC has a strong record of projects in this area: 34 for over $27 million USD, $10.5 million USD coming from ISTC and $16.5 million USD coming from CERN co-funded or partner funded projects. ISTC has been selected by the Russian Energy Ministry, Rosatom, as a priority path of collaboration for Rosatom institutes with CERN and other High Energy Physics institutes.

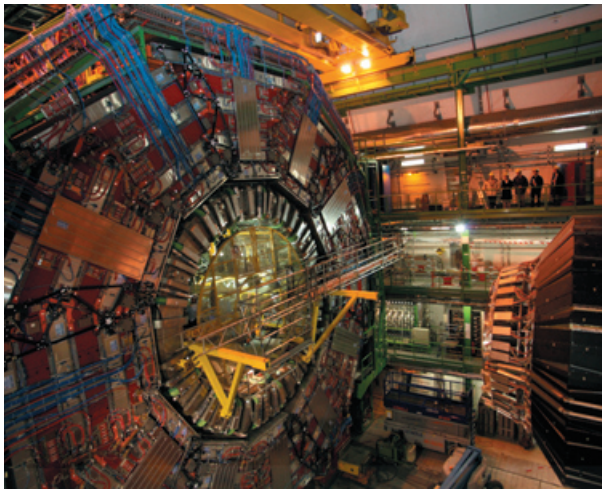
The work which recently commenced at the LHC (Large Hadron Collider) at CERN should be able to answer some of the fundamental questions of physics. However, before the LHC could accomplish these objectives, major upgrades were required on the existing scientific infrastructure.

In order to achieve these critical upgrades, CERN collaborated closely with the **Budker Institute of Nuclear Physics of the Siberian Branch of the Russian Academy of Sciences (Novosibirsk)** and the **Russian Federal Nuclear Center – Russian Scientific Research Institute of Technical Physics (Snezhinsk)** under **project # 2875** (funded by the EU and CERN)

One of the required upgrades was the CCDTL (Coupled Cavity Drift Tube Linac) structure, which is part of the proton injector complex at CERN. Starting from the experience of a preliminary CCDTL prototype manufactured at CERN, the project participants developed an improved CCDTL design based on production technologies available at the two co-operating institutes. The design takes into account all aspects of machine installation including assembly, integration into the overall structure of the LHC, support structures as well as transportation and alignment. A CCDTL prototype was built and delivered to CERN, where it was assembled by key project participants and tested at low and high RF (radio frequency) power, achieving all technical objectives required for operation with beam in an accelerator environment

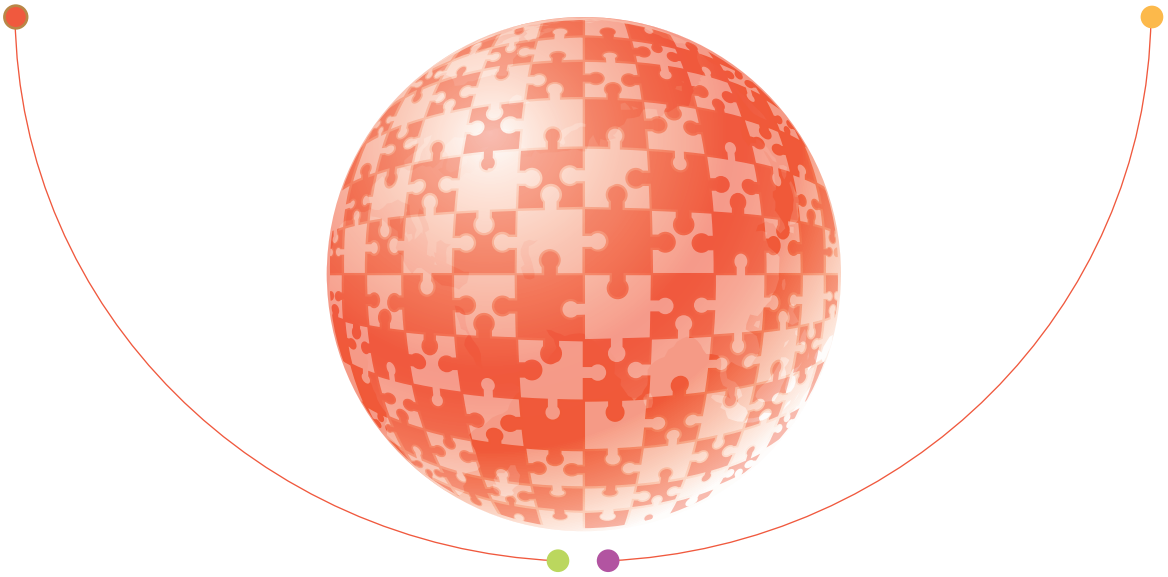
The activities within **project # 2875** evolved into 2 new complementary **projects # 3888** (regular project funded by EU with a financial contribution from CERN) and **# 3889** (partner project, fully funded by CERN). The aim of these projects is to develop, manufacture and investigate experimentally the Russian Federation cavities and entire CCDTL accelerating section in the energy range of 50-100 MeV for the new accelerator Linac4 (proton injection system). The developments that come from **project #2875** will be widely utilized and further promoted within these new projects.

A SCL (Side Coupled Linac) structure for the Linac4 high energy end has also been studied. A representative technological model of the SCL cell was designed taking into account such critical aspects as thermal load and tuning.



Large Hadron Collider

Outcome:
Scientific components for the upgrade of the CERN facilities, necessary to make the Large Hadron Collider (LHC) experiment a success, were developed, produced and manufactured



Counter-Terrorism and Global Security

For the past 14 years, ISTC has advanced global security in general by redirecting former weapons scientists of the CIS to peaceful and sustainable research. Approximately one-fifth of the projects that the ISTC has funded during this time have not only taken scientists away from weapons research, but also re-deployed them in research that addresses global security issues.

ISTC currently is engaged in 160 active projects aimed at the development and investigation of technologies, processes, and systems that support national and international security programs (this represents between 15% and 20% of all active projects). By design, such projects systematically address the scientific and technological needs of both multilateral initiatives, as well as national government programs in areas such as customs security and domestic counter-terrorism efforts.

Project areas include:

- Security and Safety: physical protection measures, including physical barriers, detection systems and user authentication systems, at the facilities that work with CBRN materials.
- Enforcement and Detection: technologies that support the secure flow of dangerous materials by improving detection at facilities, as well as during transport and storage.
- Destruction and Conversion: destruction of weapons of mass destruction (WMD) materials, including plutonium disposition, or their conversion to new forms that pose reduced risks. 'Response to CBRN Attacks/ Decontamination' is an important activity in this area, with particular focus on decontamination of water, soil, buildings and equipment affected by CBRN terrorism.
- Transportation and Conversion: secure transportation and long-term storage of CBRN materials.
- Material and Process Controls: development of technologies, processes and systems that can be used to measure, label and track CBRN materials.

Law Enforcement Targeted Initiative (LETI)

A significant ISTC activity that promotes and develops projects related to security is the Law Enforcement Targeted Initiative (LETI). LETI is a partnership effort to promote the development of civilian law enforcement technologies by former defense scientists for law enforcement agencies. LETI supports one of the primary goals identified by the G8 Global Partnership in threat reduction and the redirection of former weapons scientists. ISTC has developed experience that could be leveraged through the LETI to develop further international cooperation and promote the idea of sustainability of Russian Institutes.

The principal goals of LETI are to:

- generate civilian employment opportunities
- support law enforcement-related research and development, particularly in forensics
- enhance law enforcement's technological capacity
- foster self-sustaining relationships, and
- support international collaboration

A LETI Steering Committee (SC) reviews eligible proposals, in consultation with scientific and law enforcement experts, and provides recommendations to the Funding Party(s) for the final decision.

LETI is being implemented in a phased approach over a four-year period, focusing:

- first, on the forensic technology needs of the Russian Ministry of Internal Affairs (MVD) and
- second, expanding to encompass a broader set of law enforcement, counter-terrorism, emergency preparedness, and border inspection technology needs while engaging other relevant Russian organs of State power.

Overall funding for the LETI has been over $1 million USD with five projects financed to date (including one now completed).

Practical devices are being developed under LETI, among which is **project # 3623 "Development of Instruments and Techniques Based on Combination of Ion Mobility Spectrometry and Time-of-Flight Mass Spectrometry for Identification of Trace Quantity of Explosives".** A joint group of **Moscow Physical Engineering Institute (MIFI)** scientists twinned with their colleagues from the Forensic Science Center and the Vakkumnaya Keramika (Vacuum Ceramics) commercial company have developed an explosives identification device that has aroused much interest among the EU's commercial and scientific sectors. A testing process to improve the design and enhance the capabilities of the device is under way in 2009.

New Detection Devices

The possibility of illicit trafficking of nuclear materials is a matter of great and obvious concern. ISTC funds various projects to develop new detection methods that make rapid reactions possible.

One such project completed in 2008 is **project # 2978**: **"Digital Technology for the Detection and Control of Fissile Materials in Devices with Pulsed Neutron Sources"**. The aim was to develop a device to allow quick examinations of luggage or cargo containers. A new mobile device that works in closed and sealed areas has been created with new built-in software that makes it possible to detect in three to four seconds whether nuclear materials are present. While developing the project, a container was used to allow immediate testing of the results in a practical way. The container is similar in its design to that in diurnal use by U.S. customs services. The testing of the device has successfully ended. Initiatives have now been taken to commercialize the invention.

Another important development with a broader scope is **project # 3534**: **"Creation of a Device for Detection of Explosives, Nuclear and other Hazardous Materials in Cargo Containers and Luggage"**. The objective is to detect high explosives, nuclear materials and other hazardous substances in cargo containers and luggage. New hard- and software has been developed for the detection of various hazardous materials. The detection is carried out automatically and within a few minutes, and large volumes of goods can be inspected. Information goes to a computer that yields the results of the checks immediately. Research is also being applied to a completely different area of interest whereby an Italian group of art historians asked the research team to help with the detection of hidden frescos in some cathedrals. The aim is to find new pieces of art of Leonardo da Vinci that are painted over by work of other artists.

Outcome:
Creation of a mobile device
for detecting dangerous materials

Development of Robotic Elements for Safety and Security

The **Central R&D Institute for Robotics and Technical Cybernetics (RTC) in St-Petersburg** has been developing a mobile robotic device to be used for the examination or disabling of devices that may be a threat to human life, and that is able to work in extreme conditions beyond that where conventional robotic systems break down. This three-year-project (**project # 3711)** funded by the EU, and the team has already produced a prototype robot in its first year. The device will serve as the base for an Advanced Emergency Response Robot whose multiple missions will be to patrol and guard; minesweeping and demining; fire-fighting and the search for and removal of radioactive sources.

In 2008, the project team developed and presented a prototype device with a complex sensory system. The robot under development as part of the project will operate in several scenarios including: constant surveillance of the zone under control, object/territory guarding, identification and exact localization of objects, and movement of recovered objects. A special built-in gamma sensory system will be able to detect sources of gamma radiation and continue operating under conditions of extreme radiation if emitted from the detected sources.

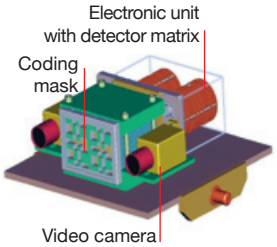
Robotic device under development

Outcome:
A prototype robotic device for use in situations dangerous to man

Smart Visual Sensors

A project team of experts from the **All-Russian Research Institute of Experimental Physics in Sarov (VNIIEF)** has developed an unique event sensor called a Smart Vision Sensor (SVS), under **project # 3195**, funded by the US. An SVS is as simple to use as a common fire sensor and is functionally equivalent to a typical contemporary video transmission and recording system. The SVS is essentially a video camera with an embedded high-performance specialized processor for video image processing.

An important secondary application of the sensor, not directly related to any counter-terrorism aspect, but being socially and commercially beneficial, is to automate the surveillance of patients in a critical care unit of a hospital. A prototype sensor with associated software and a hardware device has been created for that specific purpose and is currently in the testing phase.



Gamma-visor detection unit

Outcome:
Development of a surveillance video and image processor

Prevention of Mail Terrorism

Project # 3106 "Development of Multi-purpose Technology for the Detection of Toxic, Explosive and Radioactive Chemical Compounds", funded by the EU, involves the cooperation of a number of specialist institutes in Russia including: the **Khlopin Radium Institute (RI) in St-Petersburg, the Mining and Chemical Complex in Zheleznogorsk and the Institute of Geochemistry and Analytical Chemistry in Moscow, RF**.

Terrorists have already used anthrax spores and explosives in mail correspondence delivery and the technology under development seeks to identify similar terrorist acts and diminish damage caused by them.

The technology is aimed at the disinfection and extraction of toxic chemical compounds and radionuclides from solid surfaces, such as could be contained in materials that could be sent by mail. Furthermore, a process for the destruction of toxic, explosive and radioactive substances and pathogenic organisms is to be designed. Mail correspondence may be fully treated in whole or in part, and disinfection of contaminants can be carried out on site.

Outcome:
Development of a new technology to identify and destroy toxic elements that may be sent via mail or used inappropriately

ISTC PROJECT MAP:

LOCATION OF ISTC CURRENT PROJECTS

- ISTC PROJECT LOCATION
- CIS CAPITALS WITH ISTC PROJECTS

ISTC PROJECTS LOCATED IN MOSCOW REGION

Bolshie Vyazemy	Lyubertsy	Ramenskoye
Chernogolovka	Lytkarino	Serpukhov
Dubna	Lyubuchany	Shatura
Dolgoprudny	Nemchinovka-1	Shcherbinka
Elektrostal	Obolensk	Troitsk
Fryazino	Podolsk	Zelenograd
Khimki	Protvino	Zhukovsky
Korolev	Puschino	

ISTC 2009 – 15 Years of Success

I S T C

М Н Т Ц

лет 15 years

On 2 March 1994, the Agreement creating the International Science and Technology Center came into force. Since that date, the Center, operating from its headquarters in Moscow, has become a focal point for the promotion of international science cooperation between research institutes around the world and those based in Russia, CIS and Georgia. The Center has implemented more than 2,600 high technology projects with a total funding of $ 814.5 million USD. More importantly, it has provided direct support to scientists, engineers, technicians and institutes working in the CIS countries during a tumultuous period of change. Physics, biotechnology, environment and chemistry are just a few of the technology areas that have received ISTC project funding.

The Center was founded by the European Union, Japan, the Russian Federation, and the United States of America. Canada, Norway, and South Korea subsequently joined. It has since evolved during its 15 years, widening the scope of its activities to encompass many new challenges and needs. For example, ISTC is now heavily engaged in supporting commercialization programs and offers specific assistance to recipient scientists and institutes to obtain patents to protect their inventions. The Center also has Branch Offices in Armenia, Belarus, Georgia, Kazakhstan, the Kyrgyz Republic, and Tajikistan where it actively supports R&D.

Over time, the work of the Center has played a key role in the creation of a civil orientated research community in Russia and other countries of the CIS. It has built new networks of international contacts and, last but not least, has brought about a drastic reduction in the proliferation threats that particularly dominated the last decade. There have been many success stories to tell, from breakthrough research in physics through to the development of new nuclear medicines, diagnostics and sensors, and the development of alternative forms of energy such as new fuel cells and wind and sea generated power technologies.

Over its 15 years, the Center has built up a wealth of experience, creating genuine scientific partnerships and scientist engagement in civilian R&D as part of its international nonproliferation mandate. In recent years, it has been important for the Center to develop a greater focus on contributing to worldwide issues, in particular, global security, global warming, the development of alternative energy sources, safe nuclear technologies, as well as contributing to the prevention of dual use of bio-technologies. Discussion is ongoing on how best to adapt the working methods of the Center to face emerging global challenges and the outcome will prove crucial in ensuring that ISTC retains its hard-earned reputation and continuing relevance, especially as the Center encourages increasing numbers of private organizations to engage and assist in meeting its objectives.

ISTC will hold a number of anniversary events throughout 2009 and in all of the countries that support the work of the organization, ending the year with an international science cooperation conference in Moscow on 10 December 2009.

Scientific Advisory Committee (SAC)

SAC is an ISTC body that provides expert scientific evaluation of project proposals and assists in identifying new directions for project focus. SAC recommendations are considered by the Governing Board in respect of funding decisions on projects.

In existence since 1994, the role of SAC has been concentrated until recently on the scientific evaluation of regular projects submitted to ISTC for funding as well as organizing a yearly 'SAC Seminar' with the purpose of taking stock of key scientific fields covered by ISTC and promoting cooperation between scientists of the Parties to the ISTC.

Starting from 2008, beyond the traditional role of providing review and ratings for regular project proposals and conducting SAC Seminars, the following additional tasks have been added:

- Assessment/evaluation of the results of 'pre-selected' completed regular projects (Ex Post evaluation), which will ensure better dissemination and exploitation of project results
- Advising on ISTC Seminars and Scientific Workshop applications and performing Ex Post evaluation of these activities as appropriate

ISTC Scientific Advisory Committee (SAC) Members

During 2008, three SAC Meetings were held and 192 project proposals were evaluated

ISTC Contact Expert Groups

The ISTC Secretariat has developed a network of Contact Expert Groups (CEG) in the nuclear field.

Contact Expert Groups are informal groups of experts from ISTC Governing Board Parties that assist with the coordination of ongoing ISTC projects to form programs corresponding to international priorities in the nuclear field.

The following CEGs are actively working with ISTC:

1. Contact Expert Group on ISTC projects related to 'Partitioning and Transmutation of Radio-Active Wastes', (P&T CEG). This CEG meets annually and also holds topical workshops and meetings. The key interest is transmutation of nuclear wastes with a special focus on Accelerator Driven Systems and fast reactors together with general aspects of safety and security of the nuclear fuel cycle.
2. CEG SAM – 'Severe Accident Management'. CEG SAM meets twice a year and has usually one or two additional workshops or meetings per year. It focuses on selected topics of Nuclear Safety.
3. CEG PLIM – this Contact Expert Group on Plant Life Management has two annual meetings. The main focus is coordinated research programs supporting safe extension of the life-time of existing nuclear reactors.
4. CEG 'Fusion' – is an ISTC-STCU contact expert group coordinating efforts related to thermo-nuclear fusion problems with a special focus on 2 large facilities – JET and ITER.

Meeting of CEG PLIM in Helsinki, February 2008

Promoting CIS Science & Technology

The ISTC continuously carries out a range of promotional activities to inform the international private and public science and technology sector on R&D or late stage technology opportunities. These activities include participation at major international trade shows, organization and participation at scientific and technological exhibitions or conferences, organization and funding of sector specific science exchange workshops and targeted company visits. The ISTC also undertakes media advertising and the promotion of its services via the ISTC website, and Quarterly Newsletter and the creation of sector or event specific general promotional materials, such as CD-Roms, brochures and this Annual Report.

ISTC's Science Workshops and Seminars Program, together with parallel Supplementary Budget focused workshops, assist the integration of former Soviet Union WMD experts into the international S&T community and engenders sustainable cooperation both during the lifetime of an ISTC project and beyond. Canada, the European Union, the United States, and Japan fund these activities and in 2008, ISTC supported or organized 26 such events in Russia and other ISTC member states of the CIS and Georgia, and a further 32 events in Canada, the European Union, Japan, Republic of Korea and the United States.

ISTC Involvement in Promotional Events and Science Workshops / Seminars in 2008

10 – 12 **March**	**International Conference on Bio, Nano and Space Technologies, EU & Science Centers Collaboration**	**Ljubljana**, Slovenia
12 – 14 **March**	**Globe 2008 – Environmental Technologies Conference**	**Vancouver**, Canada
8 – 19 **March**	**44th Japan Workshop Bridging non-linear dynamics with cellular and molecular neuroscience**	**Wako**, Japan
8 – 9 **April**	**Extreme Robotics – 19th All-Russian Scientific and Technological Conference**	**St Petersburg**, Russia
14 – 15 **April**	**European Space Agency (ESA) Investment Forum 2008**	**Noordwijk**, Netherlands
14 – 18 **April**	**16th ISTC Korea Workshop on Structural and Electronic and Renewable Energy Ceramics**	**Gangneung**, Korea
16 –18 **April**	**International Conference: 10 Years of work under the auspices of the ISTC in elimination of nuclear legacy of Russian Navy (White book)**	**Moscow**, Russia
21 – 25 **April**	**Hannover Messe 2008 Hydrogen Fuel Cells and Alternative Energy**	**Hannover**, Germany
22 – 25 **April**	**International Science Conference "NANO-2008": Belarus-Russia-Ukraine**	**Minsk**, Belarus
22 – 23 **April**	**Conference: Research on Safety Technologies**	**Saarbrucken**, Germany
24 – 25 **April**	**Eurasia Bio Conference**	**Moscow**, Russia
29 **April** – 1 **May**	**ASTRO 2008. Aerospace Conference**	**Montreal**, Canada
20 – 23 **May**	**International Space Conference on Protection of Space Materials and Structures**	**Toronto**, Canada
28 – 30 **May**	**Materialoteka: 5th International Conference on Materialography and Microstructural Characterization**	**San Sebastian**, Spain
1 – 7 **June**	**The 4th International Conference "Genomics, Proteomics, Bioinformatics and Nanobiotechnologies for Medicine"**	**Nizhniy Novgorod**, Russia
2 – 6 **June**	**16th European Biomass Conference and Exhibition**	**Valencia**, Spain
4 – 7 **June**	**3rd International Probiotic Conference "Probiotics for the 3rd Millenium"**	**High Tatras**, Slovakia
6 – 8 **June**	**SpS 15 "Consoil 2008" Radioactive Contamination in Russia and other CIS countries**	**Milan**, Italy
12 – 15 **June**	**International Conference "Bacteriophages – Fundamental and Practical Research Today & Tomorrow"**	**Tbilisi**, Georgia
15 – 20 **June**	**New Developments in PhotoDetection – NDIP08**	**Aix-les-Bains**, France
23 – 28 **June**	**13th International Conference on Laser Optics**	**St Petersburg**, Russia
24 – 26 **June**	**Russian – European Workshop on Epigenetic Regulation of Genome Stability and DNA Repair**	**St Petersburg**, Russia
1 – 4 **July**	**The Second International Ecological Forum "Environment and Human Health" (EcoForum-2008)**	**St Petersburg**, Russia
4 – 8 **July**	**4th International Summer School IHISM-2008 "The Interaction of Hydrogen Isotopes with Structural Materials"**	**Nizhniy Novgorod**, Russia
7 – 11 **July**	**The International Symposium on "Hazards, Prevention and Mitigation of Industrial Explosions (7th ISHPMIE)"**	**St Petersburg**, Russia
10 – 12 **July**	**INPRO / IAEA – Nuclear Technologies - Steering Committee meeting**	**Vienna**, Austria
15 – 17 **July**	**Nuclear Forensics for the Caucasus**	**Karlsruhe**, Germany
17 – 19 **July**	**ISTC Partner Airbus Workshop**	**Toulouse**, France
20 – 26 **July**	**International Symposium "Topical Problems of Nonlinear Wave Physics" (NPW-2008)**	**Nizhniy Novgorod**, Russia
28 **July** – 3 **August**	**Issyk-Kul Summer School on "Radiation Physics, New Materials and Information Technologies (SCORPh-2008)"**	**Issyk-Kul Oblast**, Kyrgyz Republic
24 – 30 **August**	**Fifth International Symposium: Modern Problems of Laser Physics (MPLP'2008)**	**Novosibirsk**, Russia
25 – 29 **August**	**17th ISTC Korea Workshop on Utilization of Highly Densified Energy**	**Daejeon**, Korea
2 – 7 **September**	**1st Far-Eastern International Symposium on Life Sciences**	**Vladivostok**, Russia
3– 5 **September**	**The International Conference HEMs-2008: High-Energy Materials: Demilitarization, Antiterrorism and Civilian Application**	**Biysk**, Russia

14 – 19 **September**	**PHYSOR-08 – International Conference on Physics of Reactors**	**Interlaken**, Switzerland
20 – 23 **September**	**The International Conference: State-of the-Art Biotechnology in Armenia & ISTC Contribution**	**Tsakhkadzor**, Republic of Armenia
22 – 25 **September**	**11 SAC-seminar: New trends in Chemical Toxicology**	**Moscow**, Russia
22 – 25 **September**	**The International Conference: Evolution of Cosmic Objects Through their Physical Activity**	**Byurakan**, Armenia
25 – 27 **September**	**1st International Trans Caucasus Conference on Phytopathology**	**Tbilisi**, Georgia
28 **September** – 6 **October**	**18th Conference on Chemical Reactors – CHEMREACTOR-18**	**Valletta**, Malta
1 – 3 **October**	**The 2nd International Conference on Advanced Information and Telemedicine Technologies for Health (AITTH'2008)**	**Minsk**, Belarus
1 – 3 **October**	**International Conference on Nuclear Safety – TOPSAFE-2008**	**Zagreb**, Croatia
3 – 4 **October**	**International Conference on Inflammatory Bowel Disease**	**Tsakhkadzor**, Armenia
3– 5 **October**	**International Workshop: Enteric Bacteria and Inflammatory Bowel Disease (EBIBD)**	**Sevan**, Armenia
6 – 9 **October**	**Science and Training for Biosafety Workshop**	**Puschino**, Russia
8 – 11 **October**	**Bio Korea 2008 Expo and Business Forum**	**Osong**, Korea
12 – 17 **October**	**18th ISTC Korea Workshop: Advanced Materials and Energy Saving Materials Technology**	**Cheongju**, Korea
15 – 17 **October**	**Bio Japan 2008 Expo and Business Forum**	**Yokohama**, Japan
19 – 22 **October**	**Canadian Chemical Engineering Conference**	**Ottawa**, Canada
19 – 26 **October**	**UNESCO Conference on Modern Problems in Life Sciences**	**Yerevan**, Armenia
21 – 24 **October**	**45th Japan workshop in the area of Electronic Magnetic Fields**	**Sendai**, Japan
10 – 13 **November**	**The 2nd International Workshop on Modern Chemical Technologies Application in Biomedicine and Health Protection**	**Bishkek**, Kyrgyz Republic
24 **November** – 5 **December**	**NATO / ASI Laser Control and Monitoring 2008 Conference**	**Ottawa**, Canada
25 – 30 **November**	**18th ISTC Korea Workshop**	**Cheongju**, Korea
26 – 28 **November**	**EU / CIS Seminar Advances in Drug Resistant Infectious Diseases**	**Lyon**, France
27 – 28 **November**	**46th Japan workshop: ISTC-NIRS Workshop on Cytogenetic Biodosimetry**	**Chiba**, Japan
1 – 2 **December**	**47th Japan Workshop: International Workshop on Radiation Health Effects. Research from Basic to Clinical Research**	**Nagasaki**, Japan
2 – 4 **December**	**International Nuclear Forensics and Law Enforcement Conference**	**Karlsruhe**, Germany

Competency Building Program

This Program supports former weapons of mass destruction (WMD) experts and their organizations by providing and helping to improve basic skills needed to create, maintain and develop self-sustainable business and commercialization technologies. The following courses and seminars were provided by ISTC in 2008.

Multimedia Training Courses, Remote Education and Seminars

11 **Febuary** – 17 **March**	Intellectual Property	**Obninsk**, Russia
19 **February** – 31 **March**	Project Management	**Dimitrovgrad**, Russia
8 **April**	Innovative Activities, R&D Results, Commercialization	**Dushanbe**, Tajikistan
10-11 **April**	Seminar for Technology Managers	ISTC, **Moscow**, Russia
14 **April** – 26 **May**	Presentation Skills	**Almaty**, Kazakhstan
13 **May** – 20 **June**	Business Administration	**Obninsk**, Russia
24-26 **June**	Commercialization Seminar	**Issyk-Kul**, Kyrgyz Republic
3-5 **September**	Seminar on Commercialization of R&D Results in Belarus and IPR	**Minsk**, Belarus
8 **September** – 20 **October**	Introduction to Commercialization	**Yerevan**, Armenia
26 **September** – 10 **November**	Business Administration	**Minsk**, Belarus
October – **December**	Training on Business Projects Preparation, Presentation Skills and Negotiation Skills	**Moscow**, Russia
October – **December**	Training on Knowledge and Technology Management	**Moscow**, Russia
October – **December**	Training on Business Project Preparation, Business Presentation and Negotiations	**Moscow**, Russia
20 **October** – 15 **December**	Business plan Development	**Snezhinsk**, Russia
24 **October** – 4 **December**	Project Management	**Tbilisi**, Georgia
27 **October** – 23 **December**	Training on Basic Computer Knowledge	**Dushanbe**, Tajikistan
3 **November** – 5 **December**	Business Communication	**Obninsk**, Russia
5-7 **November**	Training on High Technology Marketing and IPR	**Ekaterinburg**, Russia
10 **November** – 24 **December**	Intellectual Property	**Dimitrovgrad**, Russia
December 2008 – 31 **January** 2009	Project Management	**Tbilisi**, Georgia
December 2008 – **January** 2009	Intellectual Property	**Dushanbe**, Tajikistan
19-20 **December**	Commercialization Seminar	**Ekaterinburg**, Russia

Summary of ISTC Project Funding

Technology area	Funded in 2008		Completed in 2008		Funded 1994-2008	
	№ of projects	Allocated funds ($)	№ of projects	Allocated funds ($)	№ of projects Total	Allocated funds Total ($)
Agriculture Diagnostics, Disease Surveillance, Food & Nutrition, Plant Protection, Vaccines and Therapeutics	0	0	9	2,226,715	78	26,524,394
Biotechnology Biochemistry, Biodiversity, Bioinformatics, Industrial Biotechnology, Bioremediation, Biosafety and BioSecurity, Cytology, Genetics and Molecular Biology, Microbiology, Radiobiology	10	3,102,419	24	10,923,655	275	102,063,337
Biotechnology and Life Sciences Biochemistry, Cytology, Genetics and Molecular Biology, Ecology, Immunology, Nutrition, Pathology, Pharmacology, Physiology, Radiobiology	2	593,645	0	0	11	3,510,772
Chemistry Analytical Chemistry, Industrial Chemistry and Chemical Process Engineering, Photo and Radiation Chemistry, Physical and Theoretical Chemistry, Control and Accounting, Destruction and Conversion, Safety and Security	11	2,634,734	20	6,570,452	192	51,117,538
Environment Environmental Health and Safety, Modeling and Risk Assessment, Remediation and Decontamination, Seismic Monitoring, Solid Waste Pollution and Control, Waste Disposal, Dangerous Materials Transportation	6	1,824,416	34	9,289,294	425	131,984,384
Fission Reactors Decommissioning, Experiments, Fuel Cycle, Reactor Fuels and Fuel Engineering, Nuclear Instrumentation, Isotopes, Materials, Modeling, Nuclear and Other Technical Data, Nuclear Safety and Safeguarding, Materials and Materials Conversion, Control and Accounting, Physical Safety and Security at Facilities	7	1,274,112	18	5,615,340	255	85,059,416
Fusion Hybrid Systems and Fuel Cycle, Inertial Confinement Systems, Plasma Physics	3	1,556,364	1	97,677	51	15,909,488
Information and Communications High Performance Computing and Networking, Data Storage and Peripherals, Microelectronics and Optoelectronics, High-Definition Imaging and Displays, Sensors and Signal Processing, Year 2000 Problem	2	758,160	8	1,574,402	106	28,462,358

Technology area	Funded in 2008		Completed in 2008		Funded 1994-2008	
	№ of projects	Allocated funds ($)	№ of projects	Allocated funds ($)	№ of projects Total	Allocated funds Total ($)
Instrumentation Measuring Instruments	5	1,111,102	7	1,986,665	134	37,096,730
Manufacturing Technology CAD and CAM, Engineering Materials, Machinery and Tools, Manufacturing, Planning, Processing and Control, Plant Design and Maintenance, Robotics, Tribology	1	30,108	5	1,259,367	76	20,977,163
Materials High Performance Metals and Alloys, Ceramics, Composites, Organic and Electronics Materials, Explosives, Control and Accounting	3	1,627,250	11	2,912,808	207	66,742,166
Medicine Diagnostics & Devices, Disease Surveillance, Drug Discovery, Radiomedicine, Vaccines	6	1,989,106	24	10,017,564	218	80,206,344
Non-Nuclear Energy Batteries and Components, Fuel Conversion, Fuels, Heating and Cooling Systems, Miscellaneous Energy Conversion, Solar Energy	3	1,159,093	7	3,336,556	63	21,630,981
Other Agriculture, Building Industry Technology, Electrotechnology	1	170,730	1	200,000	19	3,079,242
Other Basic Sciences Geology, Natural Resources and Earth Sciences	1	334,646	1	216,621	27	6,082,250
Physics Atomic and Nuclear Physics, Fluid Mechanics and Gas Dynamics, Optics and Lasers, Particles, Fields and Accelerator Physics, Plasma Physics, Radiofrequency Waves, Structural Mechanics	14	6,835,370	34	11,902,919	406	104,699,673
Space, Aircraft and Surface Transportation Aeronautics, Extraterrestrial Exploration, Manned Space Station, Space Safety, Spacecraft Trajectories and Mechanics, Surface Transportation, Unmanned Spacecraft, Space Vehicles and Support Equipment	4	1,232,491	8	2,179,246	103	29,407,184
Total	79	26,233,746	212	70,309,280	2646	814,553,420

ISTC Structure

Permanent Governing Board Parties


Canada


European Union


Japan


Russian Federation


United States

Other Parties


Norway


Republic of Korea

CIS Parties


Armenia


Belarus (Board Member in 2008)


Georgia


Kazakhstan


Kyrgyz Republic (Board Member in 2009)


Tajikistan

The Governing Board includes representatives of Canada, the European Union, Japan, the Russian Federation, and the United States, plus one rotating seat for a member CIS country, held by Belarus in 2008 and Kyrgyz Republic in 2009.

The Coordination Committee representatives are appointed by the Parties and meet prior to Governing Board meetings to review details of projects to be considered by the Board, discuss coordination of project funding, and exchange views on policy and other issues to be brought before the Governing Board.

The Scientific Advisory Committee provides expert scientific evaluation of project proposals and evaluates ongoing projects, as directed by the Governing Board.

Members of the Governing Board:

Chair (USA)	Ronald F. Lehman II
Canada	Troy Lulashnyk
European Union	Pauli Anneli
Japan	Jun Yanagi, Takeshi Hikihara
Russian Federation	Lev Ryabev
United States of America	Victor Alessi

Kyrgyz Republic (Board Member in 2009) Jorobekova Sharipa

Members of the Scientific Advisory Committee:

Japan	Sugimoto Jun, Yutaka Murakami
Canada	Konstantin Volchek, Henry Mantsch
European Union	Jean-Pierre Contzen, André Syrota
Russian Federation	Evgeny Avrorin, Yuri Trutnev
United States of America	Steven Gitomer, Upendra Rohatgi Singh

Parties Contact Information

Canada

Sabine Hey – Senior Program Manager
Redirection of Former Weapons Scientists
Global Partnership Program
Department of Foreign Affairs and International Trade
Ottawa, Canada
Tel: 1 (613) 944-2429
Fax: 1 (613) 944-1130
E-mail: sabine.hey@international.gc.ca

European Union

Robert Burmanjer – Head of Unit, Unit RTD-D3
Specific International Cooperation Activities
Directorate General for Research
European Commission Brussels, Belgium
Tel: 32 (2) 296-8944
Fax: 32 (2) 296-6252
E-mail: robert.burmanjer@ec.europa.eu

Russian Federation

Lyubov Kondratenkova – Coordinator, ISTC
Federal Agency for Atomic Energy
Moscow, Russian Federation
Tel: 7 (499) 949-2012
Tel: 7 (499) 949-2047
Fax: 7 (495) 230-2420
E-mail: LKondratenkova@umvs.faae.ru

Andrei Krutskikh
Department for New Challenges and Threats
Ministry of Foreign Affairs
Moscow, Russian Federation

Japan

Katsuhiro MATSUMOTO
International Science Cooperation Division
Disarmament, Non-Proliferation and Science
Department Ministry of Foreign Affairs, Japan
Tel: 81-3-3580-3311 ext.3133
Fax: 81-3-5501-8228
E-mail: katsuhiro.matsumoto@mofa.go.jp

Hiroshi YOSHIDA
International Science Cooperation Division
Disarmament, Non-Proliferation and Science Department
Ministry of Foreign Affairs, Japan
Tel: 81-3-3580-3311 ext.5434
Fax: 81-3-5501-8228
E-mail: hiroshi.yoshida-3@mofa.go.jp

United States of America

Kathryn Insley – US Coordinator, Science Center Program
Bureau of International Security and Nonproliferation
Office of Cooperative Threat Reduction
Department of State
Washington, DC, USA
Tel: 1 (202) 647-2056
Fax: 1 (202) 736-7698
E-mail: InsleyKE@state.gov

Norway

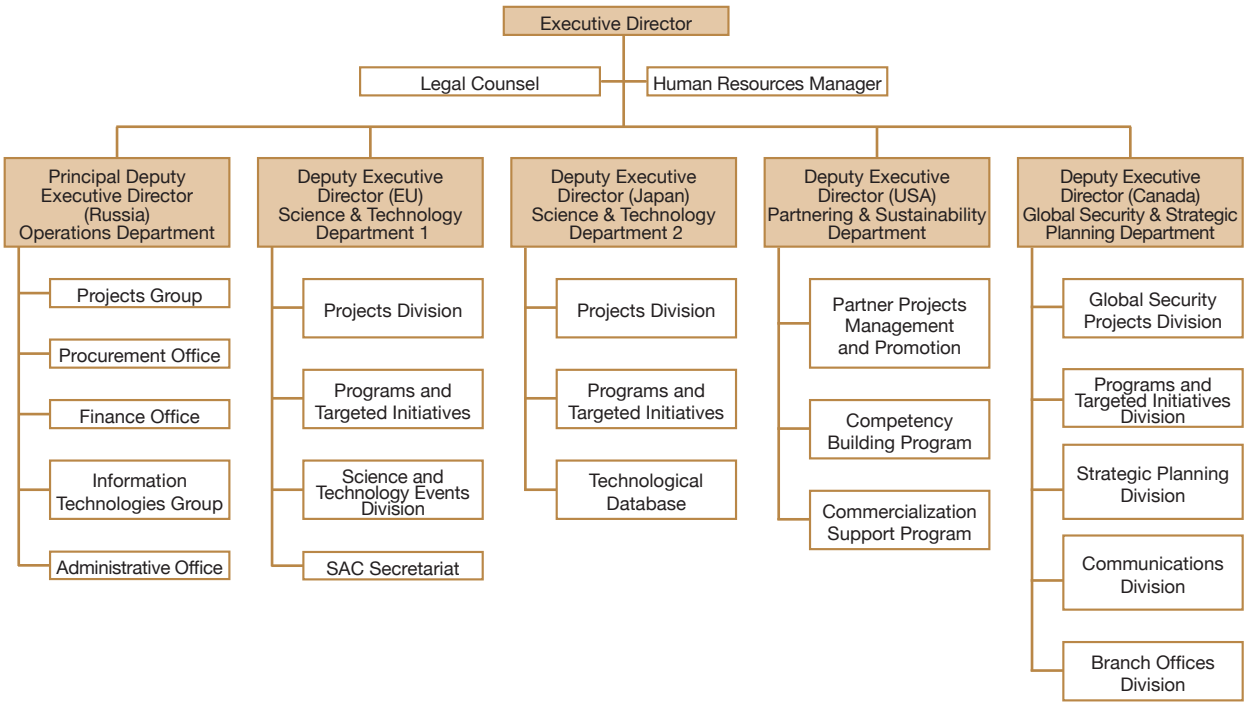
Joergensen Roger – Advisor
Section for the High North, resources and Russia
Royal Norwegian Ministry of Foreign Affairs
Oslo, Norway
Tel: 47 (2) 224-3246
Fax: 47 (2) 224-2774
E-mail: roj@mfa.no

Republic of Korea

Hyun CHOI – Deputy Director
Multinational Cooperation Division
Ministry of Education, Science and Technology
Seoul, Republic of Korea
Tel: 82 (2) 2100-6786
Fax: 82 (2) 2100-6785
E-mail: valbina@mest.go.kr

Dae Myung LEE – Program Manager
Global R&D Networking Department
Korea Foundation for International Cooperation of
Science and Technology (KICOS)
Seoul, Republic of Korea
Tel: 82 (2) 6710-7443
Fax: 82 (2) 6710-7409
E-mail: dmlee@kicos.or.kr

ISTC Secretariat



Secretariat Contact Information

General Inquiries / Public Information
Phone: 7 (495) 982-3200
Fax: 7 (499) 982-3201
E-mail: istcinfo@istc.ru

Executive Director (European Union)
Adriaan van der Meer
Phone: 7 (495) 982-3100
Fax: 7 (499) 978-0110
E-mail: vandermeer@istc.ru

Principal Deputy Executive Director
Sergey Vorobiev
Operations (Russian Federation)
Phone: 7 (495) 982-3102
Fax: 7 (499) 978-1331
E-mail: vorobiev@istc.ru

Deputy Executive Director
Global Security & Strategic Planning (Canada)
Leo Owsiacki
Phone: 7 (495) 982-3103
Fax: 7 (499) 978-0227
E-mail: owsiacki@istc.ru

Deputy Executive Director
Science & Technology 1 (European Union)
Waclaw Gudowski
Phone: 7 (495) 982-3210
Fax: 7 (499) 978-4637
E-mail: gudowski@istc.ru

Deputy Executive Director
Science & Technology 2 (Japan)
Yasuhiro Yukimatsu
Phone: 7 (495) 982-3108
Fax: 7 (499) 978-3603
E-mail: yukimatsu@istc.ru

Deputy Executive Director
Partnering & Sustainability (USA)
Michael Einik
Phone: 7 (495) 982-3111
Fax: 7 (499) 978-4926
E-mail: einik@istc.ru

ISTC Branch Office, Armenia
Yerevan, Republic of Armenia
Hamlet Navasardyan
Tel.: 374 (10) 52-47-40
Fax: 374 (10) 58-44-83
E-mail: navasardyan@istc.ru

ISTC Branch Office, Belarus
Minsk, Republic of Belarus
Alexander Klepatsky
Tel.: 375 (17) 294-9130
Fax: 375 (17) 294-9136
E-mail: klepatsky@istc.ru

ISTC Branch Office, Georgia
Tbilisi, Georgia
Irina Khomeriki
Tel.: 995 (32) 223-700
Fax: 995 (32) 912-386
E-mail: khomeriki@istc.ru

ISTC Branch Office, Kazakhstan
Almaty, Republic of Kazakhstan
Natalya Tomarovskaya
Tel.: 7 (727) 293-9740
Fax: 7 (727) 293-9694
E-mail: tomarovskaya@istc.ru

ISTC Branch Office, Kyrgyzstan
Bishkek, Kyrgyz Republic
Vitaly Kovalenko
Tel: 996 (312) 431-171
Fax: 996 (312) 431-171
E-mail: kovalenko@istc.ru

ISTC Branch Office, Tajikistan
Dushanbe, Republic of Tajikistan
Mukhabatsho Khikmatov
Tel.: +992 (37) 227-8737
Fax: +992 (37) 227-9394
E-mail: khikmatov@istc.ru
istc-tio@mail.ru

Glossary of Main ISTC Terms and Programs

Bio-safety/Bio-security Program is aimed at providing additional resources to support various Bio-safety and Bio-security initiatives.

Commercialization Support Program is aimed to facilitate and strengthen long-term commercial self-sustainability efforts by ISTC beneficiaries through promoting marketable products and services.

Communication Support Program (CSP) is aimed to support eligible CIS institutes and organizations for building IT infrastructure where existing capabilities inhibit the accomplishment of ISTC projects and the development of commercial opportunities.

Competency Building Program is aimed to support former Weapons of Mass Destruction (WMD) experts and their organizations by providing and improving basic skills needed to create, maintain and develop self-sustainable business and commercialization of technologies.

Counter-Terrorism Program is aimed to support activities with respect to counter-terrorism and law enforcement, which are within the mandate of the ISTC and which are not yet foreseen and are not available through existing ISTC activities, such as regular projects.

Governing Board is the primary ISTC decision-making body, which is made up of representatives from Canada, the European Union, Japan, the Russian Federation and the United States, with one yearly rotating seat for representation of one of the CIS Party.

Mobility Program is aimed at providing additional possibilities of direct communication of the CIS scientists with their colleagues from abroad through financing international travels related to ISTC projects and activities.

Partner Promotion Program is aimed to attract, initiate and develop active partnerships, networks and Partner projects with private industries, NGOs and Governmental organizations coming from the ISTC Parties.

Patenting Support Program is aimed to provide assistance and support in appropriate protection of intellectual property created under regular projects for its effective exploitation.

Programmatic Approach is a policy of the ISTC, approved in 2003, which encourages the development of projects along 6 selected or topical areas.

Science Workshop and Seminar Program is aimed at promoting the integration of ISTC beneficiary institutions and their former WMD experts into the global S&T community through supporting of various science events.

Scientific Advisory Committee (SAC) is an ISTC body that provides expert scientific evaluation of project proposals, determines new directions for project activity, and evaluates ongoing projects on behalf of the ISTC Governing Board.

Scientific Subscription Initiative is a new program launched in 2006 to provide electronic access to internationally known scientific journals, publications and information services.

International Science and Technology Center (ISTC)
Krasnoproletarskaya 32-34,
127473, Moscow
Russian Federation

www.istc.ru