I S T C

М Н Т Ц

Annual Report 2010

Developing International Scientific Cooperation

International Science and Technology Center

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Developing International Scientific Cooperation

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Statement of the Governing Board Chairman

Twenty years after the ISTC was envisaged, nineteen years after its basic agreement was signed, and seventeen years after the Center opened its doors, the member Parties find themselves completing the core of their original mission in the Russian Federation and revisiting the fundamental question, "What is the role of multilateral cooperative scientific engagement on behalf of nonproliferation, international security, and other global challenges, now and in the future, and how do governments organize to do it?"

In a sense, the Center has undergone such an assessment every year since its founding. This intergovernmental organization, involving forty nations in cooperative science on behalf of international peace and security, has constantly reexamined its assumptions and altered its path in order to serve the interests of the Parties in a world of rapid and profound change. Many significant changes in membership, scope, and management were implemented over nearly two decades. These efforts at improvement, reform, refocusing, and transformation should provide important inputs to decisions the Parties will face today and in the months ahead.

To those who have seen the valuable contributions of the ISTC over the last two tumultuous decades, the ISTC is very important. The ISTC has already provided over 850 million USD funds that have contributed significant scientific advancement, economic wellbeing, and national security directly to the Parties and indirectly to the rest of the world. The excellence of many scientific institutions was restored. Peer-to-peer scientific synergy was provided. Transition to modern management practices was enabled. Commercial enterprises were facilitated.

The list of accomplishments is long and includes the demonstration that governments could work together both intensely and multilaterally in this important field. More importantly, cooperation and confidence among the Parties was often enhanced as they confronted the challenges of rapid change. Indeed, the ISTC experience is most valuable exactly in such turbulent environments. Economic dislocations, political transitions, and technological revolutions confront all the Parties. The same science and technology that can present fast moving challenges can nevertheless also help provide solutions. Pooling many nations' scientific talent multiplies the contributions that S&T can make to address today's needs, and the ISTC has shown the special skills that help to do this.

Given the proud history of the ISTC, it would be easy to define the ISTC by its past contributions. Given the additional contributions that the intense scientific cooperation demonstrated by the ISTC suggest are possible, it would be better to look to the needs of the future. This view was shared widely at the 15th Anniversary brainstorming conference and continued since then as the Governing Board has pressed for transformation and urged movement away from simply repeating what was. What was an urgent objective has now become an unavoidable necessity.

The ISTC is not the only institution in which international science cooperation takes place, but it is a particularly valuable one. If the ISTC did not already exist, it would be difficult to create it today. That it does exist, however, permits the Parties to draw on considerable experience and lessons-learned as they consider next steps in cooperative science while ensuring that important projects underway are not neglected during that process.

The ISTC involves many different governments, and different parts of governments, and it involves many experts, locations, and projects that are sensitive. By mobilizing multilateral resources transparently focused on explicit Party needs while demonstrating highly responsible care for Party concerns, the ISTC has been able to accomplish what other approaches might not be able to do. The ISTC has been a key instrument of international partnership. Recently, an independent evaluation characterized the Center as a "unique mechanism for fostering international collaboration, enhancing coordination of projects and sharing lessons learned." In the face of rapid change, there is a premium on keeping options open and planning for agility.

Membership and funding multilateral, embedded scientific engagement is based upon shared priorities and on that basis has changed over the years and will surely change again. Among the Parties to the ISTC are some of the largest, wealthiest, and most scientifically advanced nations. Also among the Parties are smaller nations with equally important needs, but also with great scientific talent. The scientists of nations large and small have benefited greatly by being able to resume past collaborations and create new ones. This peer-to-peer engagement of scientific talent has often enabled scientists from around the world to team with just the right expertise to maximize scientific progress and to modernize economies through innovation. The ISTC has established a pattern of collaboration that can serve our countries in the future as a foundation for partnership between and among equals.

The success of an organization like ISTC very much depends on the commitment of the Party governments and the enthusiasm of the individuals who are working together. The 15th Anniversary was a good occasion to personally thank many of those who have so enthusiastically committed their skills, energies, vision and time to the work of the Center and to enhancing its future contributions.

This year, 2011, will be dramatic for the International Science and Technology Center (ISTC). The Governing Board will be taking important decisions to

rebalance ISTC efforts among the Parties as the Center begins ramping down its operations in the Russian Federation. At the same time, the Parties are considering next steps in the face of budgets that are more restrained, demands that are more diverse, and priorities that are less clearly shared at home and abroad.

On behalf of the Governing Board, I would like to express particularly deep appreciation to Dr. Victor Alessi, a physicist, a former senior government official, and one of the founders of the ISTC. His long service on the ISTC Governing Board and as Acting Board Chairman during critical periods provided strength and continuity to the entire organization and facilitated strong support in capitals. We on the Governing Board are all greatly indebted to him for his support, guidance, and friendship over the years that we have all worked together. Moreover, he will be missed as well by the many scientists and ISTC staff who, as Vic always reminded everyone, are the heart of the whole endeavor.

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

Statement of the Executive Director

In 2010, ISTC has proven yet again to be one of the few organizations working in the former Soviet space that is capable of delivering real scientific and technological cooperation.

This annual report shows the main results of our work i.e. providing high quality scientific collaboration to parties and partners that work together on a multilateral basis in order to contribute to the solution of common problems.

Our work confirms that nowadays scientific problems are so complicated and widespread that adequate results can only be achieved through combined efforts.

For example, scientists need to improve new clean technologies for the future development of smart and green - low-carbon – economies. New types of medicine are needed to deal with increasing resistance to existing pharmaceuticals. New detection and control measures are required to ensure a safe nuclear renaissance. But our challenges go beyond earth limits and you can read in this report about a project resulting in a contract to deliver spectrometers for the radiation safety of the International Space Station (ISS) crew members. We've also signed a memorandum of understanding with University College London to encourage multilateral work on various space technologies like a miniature satellite attempting to predict earthquakes.

It is with these challenges in mind that in 2010 numerous workshops and seminars were held bringing together the best possible expertise. Results of scientific projects were presented and discussed at these occasions. In addition ISTC arranged at short notice a number of scientific events related to current problems such as volcanic ash clouds, space debris and infectious diseases. This showed the ability of ISTC to respond quickly to new developments. The seminar organized by ISTC's Scientific Advisory Committee (SAC) on high-energy physics led to new insights in this complex matter. This event was part of a major drive to promote research in this field under a new Targeted Initiative. An overview was published on the results of ISTC projects in this field.

In 2010, work continued on the preparation and implementation of seven other Targeted Initiatives at ISTC. These initiatives are:

- Fuel Cells Targeted Initiative
- Drug Design & Development Targeted Initiative
- Science & Technology in the Prevention of Biological Threats Targeted Initiative
- Law Enforcement Targeted Initiative
- Probiotics & Health Targeted Initiative
- Scientific and Technical Support against the Illicit Trafficking of Nuclear and Radioactive Materials Targeted Initiative
- Technical support for IAEA Advanced Safeguard and Verification Development program.

Our task is also to attract young people to scientific work. Therefore, ISTC continued to organize special competitions for young scientists. Moreover, and for the first time in the history of ISTC, a Summer School was organized in Kazakhstan on high-energy physics. I am very grateful to CERN and the Research Center at Dubna but also to the Kazakh hosts for the success of this event.

Part of ISTC's work in 2010 was also related to the commercialization of research results. A number of technology outreach events were organized to bring scientists and technology developers together to assess the potential commercial value of ISTC funded projects and to develop business opportunities. New joint ventures have been created bringing new products to the market in Russia and elsewhere, creating jobs and economic diversification.

In 2010, ISTC funded 52 new projects in the amount of 14.6 million USD of which ISTC partners provided 10.8 million USD for 39 projects. Direct grants were paid to 11,000 scientists and their team members amounting to 25.5 million USD.

ISTC welcomed 23 new partner organizations in 2010 bringing the total number of partners to 457 since the start of ISTC partner program. Since 1994, ISTC has financed 2,745 projects with a total volume of over 853.6 million USD.

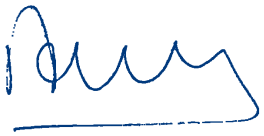
ISTC started an important discussion on the future transformation of the organization in order to adequately address changed needs. At the end of the year there was a convergence of views on the way forward, i.e. the need to set up a new organization dealing with global scientific challenges including non-proliferation, scientists' engagement and activities aimed at further modernization of various economies. All agree that working modalities need to be changed to take these developments into account. Unfortunately, this discussion has been overshadowed by the decision of one of the major parties, i.e. the Russian Federation to withdraw from ISTC. Much time was devoted to the possible consequences of this decision. It will be necessary to maintain the organization for some time under full application of the provisions of the ISTC Agreement in order to continue with ongoing and previously planned projects as well as with other activities such as training courses to improve skills of individual scientists and engineers. Special arrangements need to be made for the work to continue in Armenia, Belarus, Georgia, Kazakhstan, the Kyrgyz Republic, and Tajikistan. It is important to maintain the delivery capacity of ISTC.

During the years, through the work of ISTC, a unique model was developed that could serve as a good basis

for further multilateral scientific and technological cooperation. It is important that Russia and other major partners stay engaged in such work. The other countries of the CIS and Georgia made a Statement emphasizing the importance of multilateral scientific cooperation on the basis of equality and partnership.

Personally in 2010, I was very pleased to receive, on behalf of ISTC, an Honorary Doctorate from the Technical University of Tbilisi (Georgia) as well as to receive the Golden Honorary Medal of the National Academy of Sciences of Armenia. I consider these awards as an important token of support to those involved in the work of ISTC especially to staff working at the ISTC Secretariat.

I hope you enjoy reading the 2010 Annual Report and the overview of many projects funded by the Parties and Partners of ISTC. Our website is also an important source of information and I would recommend a visit to the site at www.istc.ru. A new publication summarizing the main results of ISTC's work over the last 15 years is available as well as publications on our activities in space research and renewable energy.



Adriaan van der Meer
ISTC Executive Director

ISTC – Pursuing our Objectives

The ISTC coordinates the efforts of numerous governments, international organizations, and private sector industry, providing 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.

The objectives of the ISTC are to:

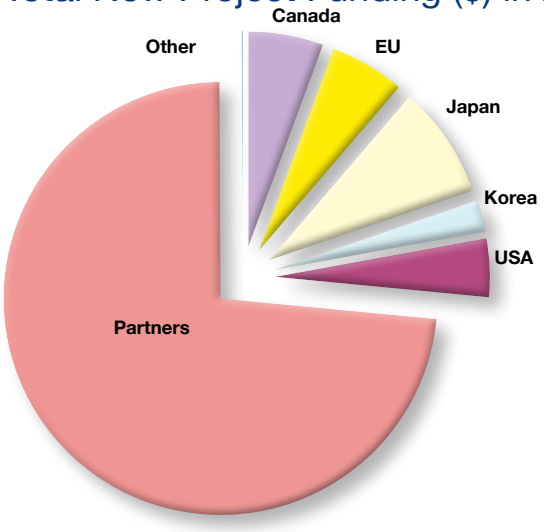
- Provide scientists in Russia, Georgia and other countries of the Commonwealth of Independent States (CIS) the opportunity to apply their knowledge and skills to peaceful activities
- Support basic and applied research and technology development
- Contribute to the transition to market-based economies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

Overview of ISTC Activities in 2010

In 2010, the ISTC accomplished:

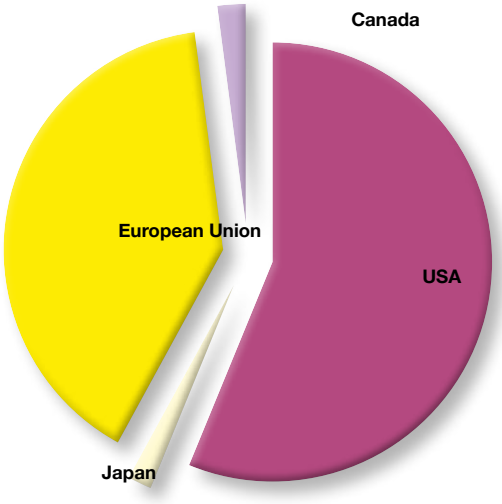
- New project funding for 52 projects in the amount of $14.5 million USD, of which ISTC Partners from public and private organizations provided $10.7 million USD for 39 projects;
- Addition of 23 new Partners, to the existing 434 Partners, who have provided 267.2 million USD in project funding since program inception.

Total New Project Funding ($) in 2010 by Source



Party	Allocated Funds ($)
Canada	823,353
EU	822,490
Japan	1,234,796
Korea	347,941
USA	641,500
Partners	10,713,454
Other	11,050
Total:	**14,594,584**

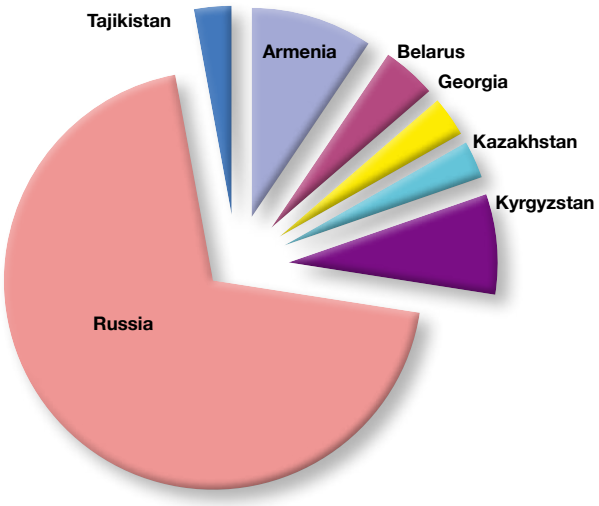
ISTC Partner Project Funding by Party in 2010



Party	№ of projects	Amount ($)
US	22	6,021,357
G	20	5,704,214
NG	2	317,143
Japan	5	188,381
G	2	86,000
NG	3	102,381
EU	9	4,281,035
G	9	4,281,035
NG	0	0
Canada	3	222,681
G	0	0
NG	3	222,681
Total	**39**	**10,713,454**
G	**31**	**10,071,249**
NG	**8**	**642,205**

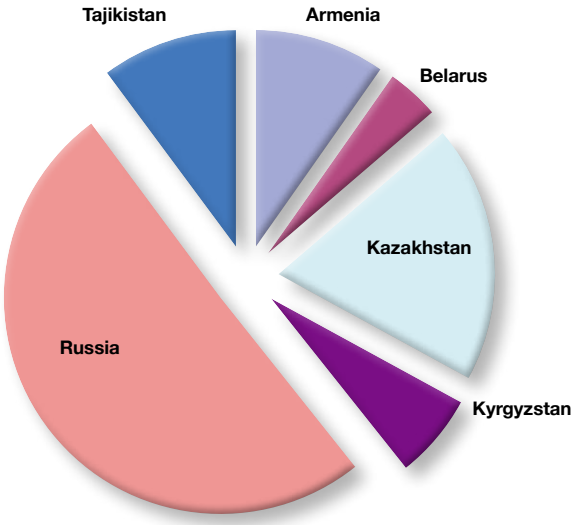
G = Government Organizations; NG = Non-Government Organizations

Grants paid in 2010 by the ISTC to CIS Beneficiary Scientists



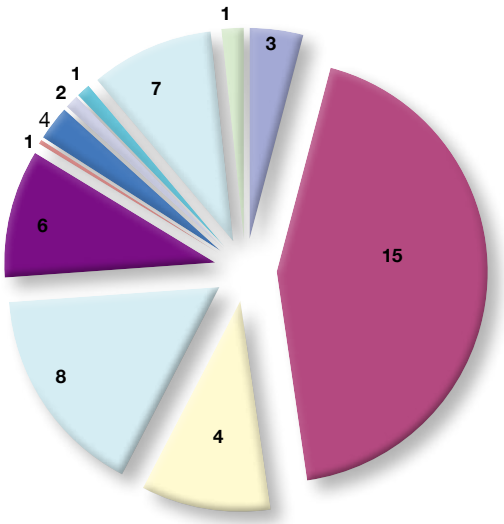
Region	№ of Scientists	Allocated Funds ($)
Armenia	991	2,414,894
Belarus	336	1,077,960
Georgia	377	800,269
Kazakhstan	950	1,985,942
Kyrgyzstan	296	745,721
Russia	7,789	17,810,321
Tajikistan	285	741,310
Total	**11,024**	**25,576,416**

2010 Project Funding by Beneficiary Country



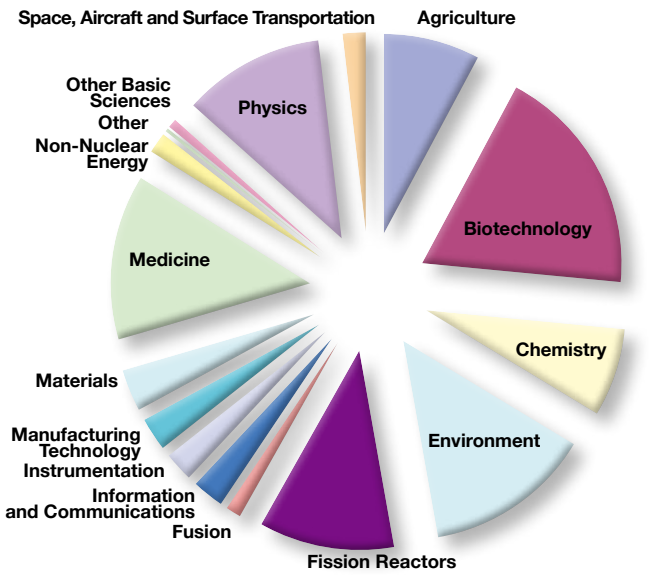
Country	№ of projects	Allocated funds ($)
Armenia	4	1,423,103
Belarus	5	576,109
Kazakhstan	4	2,810,670
Kyrgyzstan	3	925,543
Russia	28	7,375,966
Tajikistan	8	1,483,193
Total	**52**	**14,594,584**

2010 Project Funding by Technology Area



Tech area	№ of projects	Allocated funds ($)
Agriculture	3	600,000
Biotechnology	15	6,360,983
Chemistry	4	1,450,637
Environment	8	2,368,745
Fission Reactors	6	1,435,818
Information and Communications	1	50,000
Materials	4	388,095
Medicine	2	154,429
Other Basic Sciences	1	156,700
Physics	7	1,379,177
Space, Aircraft and Surface Transportation	1	250,000
Total	**52**	**14,594,584**

Ongoing Projects in 2010 by Technology Area



Technology area	№ of projects	Allocated funds ($)	Allocated funds (%)
Agriculture	39	19,277,761	7.8%
Biotechnology	83	46,105,720	18.7%
Chemistry	55	17,620,381	7.1%
Environment	85	33,404,854	13.5%
Fission Reactors	57	27,063,872	11.0%
Fusion	7	3,045,475	1.2%
Information and Communications	17	6,355,351	2.6%
Instrumentation	22	5,868,554	2.4%
Manufacturing Technology	14	6,650,877	2.7%
Materials	26	8,384,985	3.4%
Medicine	69	33,091,056	13.4%
Non-Nuclear Energy	7	4,172,035	1.7%
Other	3	719,533	0.3%
Other Basic Sciences	7	1,850,414	0.8%
Physics	77	28,394,781	11.5%
Space, Aircraft and Surface Transportation	14	4,620,314	1.9%
Total	**582**	**246,625,962**	**100.0%**

ISTC Highlights of 2010

Queen Elizabeth II Visits ISTC Project at Summer Science Exhibition

Queen Elizabeth II in front of ISTC project stand

25 June- 4 July, London - Queen Elizabeth II visited an ISTC project demonstration during the Summer Science Exhibition in London underlining the 350th anniversary of the Royal Society, a charitable organization supporting young scientists, engineers and technologists. The Queen's advisors selected 5 exhibition stands out of more than 40 displayed at the prestigious event held from 25 June to 4 July.

ISTC project #2541 developed a technology to detect and display buried land mines, even when made out of plastic, which are almost undetectable with technologies now in use. The sub surface radar technology can give a 3D image of buried land mines even in ferrous and cluttered soil that generally mixes up the signals. By determining the shape of objects, the detector could be of great help to mine-clearing experts working in very dangerous environments.

Princess Diana had been a strong advocate of the International Campaign to Ban Landmines and visited mine fields in Angola and Bosnia in her efforts to raise public awareness on the problem. The international organization Landmine Monitor has identified at least 73,000 casualties in 119 countries/areas in the past 10 years and these data are incomplete because of the lack of available statistics on the subject as many affected areas in developing countries are not accounted for.

The radar technology developed at Bauman Moscow State Technical University, has multiple applications apart from demining, such as detection of hidden construction faults. The technology has already been sold to construction companies in Japan, the US, India and China.

The New Profile of Drug Resistant Tuberculosis: A Global and Local Perspective

26-27 May, Moscow - Sponsored by the U.S. National Academy of Sciences, the Institute of Medicine, the Forum on Drug Discovery, Development and Translation, and the Russian Academy of Medical Sciences, a 2-day workshop addressed the proliferation of multidrug-resistant tuberculosis in Russia and across the globe, as well as the rapid emergence and spread of extensively drug resistant tuberculosis. The consequences of totally drug resistant tuberculosis were also discussed.

The fight against the reemergence of Tuberculosis mainly because of new drug resistant strains is a priority of ISTC since its creation in 1994. ISTC's efforts take various forms such as, funding research projects in the field of detection and drug discovery, international workshops, seminars, and the creation of an international cluster of researchers to better coordinate efforts in this field.

The development of improved diagnostics and detection methods are an integral part of ISTC activity in this field. Biochips to detect TB at an early stage and mobile test kits were developed. Both of these technologies have proven very useful in Russia and could be used in other countries where populations are not always close to medical centers.

Honorary Doctorate Given to ISTC for its Contribution to Georgian Science

5 July, Tbilisi - ISTC Executive Director, Adriaan van der Meer, has been awarded an Honorary Doctorate by the Georgian Technical University in recognition of ISTC's work over 16 years to develop international cooperation in science research and innovation in Georgia.

ISTC, through its work has offered new opportunities for scientists in Georgia; it has helped the modernization of the research infrastructure and brought Georgian scientists into contact with their peers and colleagues elsewhere in the world. Moreover, funded research has led to high-level publications and is the subject of discussion at international scientific conferences. The individual skills of scientists were further developed through their attending training courses provided by ISTC.

Archil Prangishvili, Rector of the Georgian Technical University noted: "It is an honor for us to award Mr. Adriaan van der Meer with the Diploma and Medal of Honorary Doctor of Georgian Technical University for the fruitful deeds made in the development of cooperation between the Georgian Technical University and International Science and Technology Center (ISTC)".

ISTC Delivers Keynote Address at First EU-Russia Innovation Forum in Finland

ISTC Communications Manager, Stephen Bourne

25 May, Lappeenranta - ISTC took part in the first ever high-level EU-Russia Innovation Forum, held in Lappeenranta, Finland. ISTC was invited to deliver the keynote address of the conference, underlining the Center's critical role in developing and making Russian and CIS innovation available to the world for over 15 years. The presentation emphasized the challenges of turning research results into economic development, a difficult task not only for Russia, but for research organizations all over the world.

The participants of the event included the Prime Ministers of Finland and Russia, high-level political leaders and experts from Russia and the EU, joining over 500 conference guests from 15 countries.

Mitigation of Volcanic Eruptions and Earthquakes in the North Pacific Region

10-13 May, Sapporo - The 53rd International Japan Workshop on Earthquake and Volcanic Eruption Monitoring and Disaster Mitigation in the North Pacific Region was held in Hokkaido University in Sapporo, Japan, on 10-13 May. More than 50 scientists from Japan, the US and Russia took part in the event organized by ISTC. The focus of the event was placed on earthquakes and volcanic activity in the North Pacific region, earthquake monitoring and alert systems, volcano monitoring and alert system, active fault research and crustal deformation monitoring, as well as ongoing and planned research projects in the North Pacific region.

As the world harshly noticed with the eruption of the Eyjafjallajokull volcano in Iceland and the earthquake in Japan, natural disasters can cause very broad damage to people, the environment and the economy. Natural disasters' occurrence and damages spread beyond borders. The North Pacific region, Japan, the Kuril Islands, Kamchatka, the Aleutians and Alaska, is one of the most active regions of earthquake and volcanic activity in the world.

Several ISTC projects were funded by Japan and the US on this subject. During the workshop new contacts were created between Russian, Japanese and US research institutions active in the North Pacific region that will collect and exchange information for better geo hazard monitoring.

International Conference on Introduction of New Technologies to Global Markets

14 April, Moscow – ISTC, in collaboration with the International Congress of Industrialists and Entrepreneurs (ICIE), organized the international conference Model of Interaction between International Organizations and Business Partners to Introduce New Technologies to Global Markets. Representatives of the Russian government, international organizations, Russian associations and business communities of Azerbaijan, Armenia, Belarus, Bulgaria, Germany, European Union, India, Italy, Kazakhstan, Kyrgyzstan, Latvia, Lithuania, Moldova, Russia, Ukraine, Estonia and Japan participated in the event.

ISTC presented a report about the creation, together with the ICIE, of the Partner Foundation for Assistance in Commercialization of New Technologies.

Participants who made their statements approved the approaches developed by the ISTC and the ICIE related to the creation of an efficient mechanism of technology commercialization support and demonstrated their interest in implementation of the project. Small and medium sized innovation companies exhibited their achievements in technology commercialization.

Integrating European and Russian Virus Archives

13-15 April, Moscow – ISTC, in collaboration with the European Virus Archive Project, organized an international expert meeting on cooperation in the sphere of standardization and integration of virus archives. Representatives of the Russian State Duma, the World Health Organization, ISTC and leading Russian institutes took part in the meeting.

In order to implement recommendations meeting participants and to coordinate future activities, a permanent working group is to be created including representatives from the ISTC, Russian governmental authorities, and leading virological institutes from Russia and the EU. The participation of Russia in the European Virus Archive Project would represent an important contribution as extensive research has been done in the field of virology and Russian virus archives are important.

In the last decades thousands of viruses have been isolated and partly characterized by experts working in different countries worldwide. However, nowhere in the world has there been an attempt to coordinate these collections of viruses so that they can be authenticated, amplified under quality-controlled conditions, stored long-term, and disseminated worldwide to laboratories engaged in fundamental and/or applied research.

International Workshop on Infectious Diseases

Dr.Taro NAKAYAMA, former Minister of Foreign Affairs

29 May- 2 June, Tokyo - The 54th Japan Workshop "Current Life-Threatening Infections and Medical Countermeasures" was held in Tokyo at the National Center for Global Health and Medicine and on June 1-2 in University of Niigata. Academician Oleg Kiselev , Director of the Russian Institute of Influenza, Vladimir Molochnyy , Rector of Far-East Medical University and many other leading scientists from Russia and Japan took part in the event. In Niigata, Dr.T. Nakayama, President of the Japan-Russia Medical Exchange Foundation, and former Minister of Foreign Affairs of Japan, gave the opening remark address.

A total of 36 people participated in the event including 7 experts invited by ISTC and 12 young doctors from Medical Universities and Research Centers in Siberia and far-eastern region (Krasnoyarsk, Khabarovsk and Vladivostok). The main purpose of the meeting was to share experience of each Institute from Russia in the field of infectious diseases, and promote further collaboration between Japan and Russian Institutes.

Seminar on New Perspectives of High Energy Physics

1-5 September, Novosibirsk - The ISTC Scientific Advisory Committee (SAC) jointly with the European Organization for Nuclear Research (CERN) held the 13th SAC seminar, New Perspectives of High Energy Physics, at the Budker Institute of Nuclear Physics, in Novosibirsk from 1 to 5 September. Some 85 scientists from Armenia, Belgium, Canada, France, Germany, Japan, Spain, Switzerland, UK, Ukraine, United States and Russia took part in the event.

The Seminar offered a forum to discuss the latest achievements and challenges in the field of high energy physics and to identify perspectives of future development and further technology transfer to areas such as medicine and informatics. Ongoing and planned collaboration between CERN and ISTC was discussed as well. The contribution of young scientists was underlined during a special session in which 19 presentations were given by young scientists under 35 year old. The prize for best research was attributed to Kirill Skovpen from Budker INP with the project "ATLAS sensitivity to left-right symmetry at 7 TeV."

Russian and UK Institutes Agree to Develop Joint Proposals for Space Research

From left: Victor Spasskiy, Head of Russian Trade Delegation in the UK; Dr David Parker, UK Space Agency and Rt. Hon David Willetts, Minister of State for Universities and Science

2 July, London - The UK Minister for Universities and Science, David Willetts MP, delivered the keynote address at an ISTC supported event held in London that brought together experts from five of the most prestigious space research Institutes in Russia with their peers in the UK. Three days of joint presentations and working meetings culminated in the signing of a Memorandum of Understanding between University College London (UCL), ISTC and the Russian Space Research Institutes taking part in the event.

Both the UK Minister and the Head of the Trade Delegation of the Russian Federation in the UK, Mr Victor Spasskiy, recognized the contributions of the co-organizers of the event, ISTC and UCL, as well as their crucial role in developing future cooperation in space research given the priority that both the UK and the Russian Federation places in this area.

The Memorandum of Understanding, signed at the closing of the three day event, identifies 6 specific project areas for development, notably in relation to space medicine research and monitoring satellites.

ISTC and DANONE Host the First Moscow – Based Science Café on Nutrition and Healthy Living

From left: Boris Shenderov, Jean-Michel Faurie, Chantal Cayuela (Danone Eastern Europe R&D Director), Alexander Netrusov

22 September, Moscow – ISTC and DANONE hosted a "scientific café" for journalists on the subject of probiotics and health. "Scientific café" is a program of expert presentations and discussions aimed to make scientific issues easier to understand by the public. The first "café " was devoted to probiotic food products. Probiotics is the term for live microorganisms which, when administered in adequate quantities, confer a health benefit to the host, notably for the immune system, digestion, and provide general well-being. Probiotics became an area of serious research over 100 year ago when the Russian scientist and Nobel Prize winner, E. Metchnikoff, published the results of his work.

DANONE Research, leaders in nutritional health and probiotic research, invited three prominent experts from Russia and France to discuss the benefits of probiotic nutrition.

Chantal Cayuela, Research and Development Director, DANONE Eastern Europe commented: "We see a great potential in collaboration with Russian experts for probiotic research. The mission of DANONE is to bring health through food to as many people as possible. Using the latest scientific discoveries in creation of new products helps us fulfill this mission around the world. In Russia through cooperation with the ISTC we've developed several projects aimed to further study potential application of probiotics in dairy products".

ISTC Presents Its Involvement in Ultra High Intensity Lasers in New York

26 September – 01 October, New York - An ISTC delegation took part in a conference organized by the International Committee on Ultra-High Intensity Lasers (ICUIL) at the University of Rochester, New York. Representatives of leading research centers worldwide took part in the conference. The two main Russian nuclear research centers, VNIIEF and VNIITF, participated in the framework of ISTC activities.

ISTC hosted a special session on "ISTC Ultra-High Intensity Light Science and Technologies Targeted Initiative" focused on the Center's involvement in this field. Russian scientists presented their work and explained the cooperation between Russian institutes and ISTC.

The aim of the event was to encourage discussions among scientists from various countries and generate collaborative work on the development of the next generation of ultra-high intensity lasers, exploring new areas of fundamental and applied research, and forming a global research network. The latest developments in the field of ultra-high intensity lasers lead to new opportunities beyond traditional fields of application. New areas apply to plasma physics, nuclear physics, astrophysics, and the future is very promising in the field of nuclear fusion.

Seminar on Children's Oncology

2 November, Moscow - ISTC and the "Petersburg Dialogue" organized the workshop High-Tech Diagnostics in Children's Oncology – Status and Prospective that was held on November 2. About 15 clinical experts from the Moscow region and Germany participated and discussed topical problems of diagnostics and treatment of childhood cancers both in Russia and Germany.

The main issue in this area is the lack of standards and quality control. The need for strengthening of international networks and creation of centers of excellence in children's oncology was stressed. The participants discussed potential collaboration between Dusseldorf and Moscow Onclogical & Hematological Centers.

The Petersburg Dialogue is a discussion forum that promotes understanding between civil societies of Germany and Russia. It was launched in 2001 by German Chancellor Gerhard Schroeder and Russian President Vladimir Putin. It is supported by political and private foundations, German and Russian companies and the governments of both countries.

Summer School for Young Scientists on High Energy Physics and Accelerator Physics

27 September - 3 October, Kazakhstan - The joint ISTC-CERN-JINR Summer School on High Energy Physics and Accelerator Physics was held at the Institute of Nuclear Physics in Astana. The Summer School was targeted at postgraduate and PhD students from CIS countries and Georgia. High level specialists from the Joint Institute of Nuclear Physics (Russia) and from the European Center for Nuclear Research (CERN) gave presentations to over 60 young scientists on latest developments in the field of high energy physics.

International Workshop on Probiotics & Health

5-7 October, Yerevan – Over 50 leading experts on probiotics from Russia, Ukraine, Georgia, Armenia, Kazakhstan, Kyrgyzstan, Tajikistan, Canada, Japan and the USA attended a high level workshop on probiotics research. Participants discussed the strengths and weaknesses of probiotics research and priority research areas were established. Six project proposals on probiotics were prepared and submitted to an ISTC Partner for consideration. The projects focused probiotic bacteria isolated from Caucasus and Central Asia acid milk foods. The results of this cooperation will allow developing new functional foods that might be used as preventive measures and treatment of human and animal microbial diseases as an alternative or complement to antibiotics.

Executive Director Addresses the First International Conference on Science and International Security

8 November, Madrid - ISTC Executive Director, Adriaan van der Meer, gave a presentation on ISTC 16 year experience on the first day of the Conference on Science and International Security: Addressing the Challenges of WMD Proliferation and Terrorism. The event focused on achievements and new challenges of the Cooperative Threat Reduction (CTR) Program, inspired by US Senators Sam Nunn and Richard Lugar.

Senator Lugar, commented in his keynote opening address "Many of the scientists who have cooperated with American counterparts through the Nunn-Lugar program and other programs, such as the International Science and Technology Center in Moscow, have become colleagues and friends. Their strategic competition has been replaced by scientific cooperation. If continually resourced and appropriately guided, we can build on this existing success and globalize this concept."

The biannual event was jointly organized by the Institute of Nuclear Fusion (DENIM) of the Polytechnic University in Madrid, Spain, and the Lawrence Livermore National Laboratory (LLNL) in Livermore, California.

The goal of this meeting is to bring together international leaders and policy makers, along with leading scientists to explore the key issues and challenges to international security.

From left: Adriaan van der Meer (ISTC), US Senator Richard Lugar, and Evgeny Avrorin - Academician and ISTC SAC member

Armenia Awards ISTC for Services to Research and Innovation

5 October, Yerevan - ISTC Executive Director, Adriaan van der Meer, was awarded a Golden Honorary medal by the National Academy of Sciences of the Republic of Armenia in recognition of ISTC's work over 16 years to develop international cooperation in science research and innovation in Armenia.

Accepting the Honorary medal at the National Academy of Sciences in Yerevan, Mr. van der Meer, said "This is an award that we value as one of the highest accolades ISTC has received during our 16 years of existence and today is another very proud day for my organization. Successful work in science is best carried out in true partnership and is built with time and trust. This award, I believe, is recognition of such a partnership and such a relationship between Armenia and ISTC."

From left: ISTC Exec. Dir. Adriaan van der Meer and President of the National Academy of Sciences of Armenia, Radik Martirosyan

Developing International Science Collaboration

In 1992, the Founders of ISTC were looking for different ways to integrate scientists from the Former Soviet Union into the international community of research. One of the most successful ones has been the participation of international scientific collaborators on every project funded by ISTC. During 16 years of activity, over 11,000 foreign collaborators have worked without remuneration, shoulder to shoulder with their peers from Russia other countries of the CIS and Georgia, out of curiosity at first, and then because of the high level of research carried out here. New networks were created between universities, research institutes and private companies all over the globe. In an era when science can only be successful on a multilateral scale, ISTC built bridges between countries, between people, that knew little about each other. These new friendships have been beneficial to science and have contributed to solving problems for all of mankind, through discovery of new diagnostics methods, treatments for various diseases and health problems, renewable energies, better agricultural practices, or technologies to counter terrorism, to name a few. You can read in this section the testimony of international scientific collaborators describing common research that has been done.

Project #K-1482

Contamination with Components of Space Rocket Fuel

Center of Physical and Chemical Methods of Analysis, Kazakhstan

By Lars Carlsen

Professor, DSc, Awareness Center, Roskilde, Denmark
Fields of expertise:
Environmental chemistry and Environmental Assessment

My collaboration with the Center of Physicochemical Methods of Research and Analysis (CPCMA) started approximately 10 years ago based on an invitation from the institute. The partnership picked up speed after my first visit to Almaty in 2005 and further evolved from being a foreign collaborator according to ISTC definition, meaning reviewing technical reports, to being a true collaborator over the following years with frequent visits to Kazakhstan and a series of other joint research projects. In the frame of our common work, Kazakh scientists also visited our institute in Denmark.

My participation in project #K-1482 was the natural continuation of a well-established collaboration on environmental problems related to space activities at the Baikonur Cosmodrome. The project addressed important questions about the consequences and possible toxic influence of residual rocket fuel falling back to the ground after the first stage of heavy rockets launch, e.g. the Proton rocket. Highly toxic fuels as well as other residues may have significant influence of flora and fauna as well as humans beings.

The project has obtained a series of interesting results – some of which still need to be analysed and published. I had the pleasure of being directly involved in some of these studies resulting in joint publications in international peer-reviewed journals. Further, I have been directly involved in a series of theoretical studies focussing on the assessment of residual rocket fuel and its transformation products with respect to environmental fate and toxicity as well as human toxicity – again resulting in several joint publications. Both the CPCMA group and I are very satisfied with the results of our common research work – and, in all modesty, it is my firm impression that the ISTC Funding Parties have received 'value for money'.

I will surely continue working with the CPCMA group in the future. Several new projects are already in the pipeline. I see CPCMA as a dominant player in the environmental field of analytical chemistry. The scientific level is definitely of the highest level taking into consideration their scarce resources.

I hardly need to say that apart from the scientific relations also very good personal relations between the group members have developed over the years.

Project #2770-2773

TROICA - The Need for Research on the Eurasian Atmosphere

Institute of Atmospheric Physics, Russia

By Paul Crutzen

Nobel Prize Laureate in Chemistry
Professor, Department of Atmospheric Chemistry, Max Planck Institute for Chemistry Scripps Institution of Oceanography at the University of California, USA
Seoul National University, South Korea

When the eminent scientist Vladimir Vernadsky, as early as 1924, did foresee the role of the biosphere in climate and the role of mankind on a global scale, few realized that at the beginning of the twentieth century we would already see climate change in action. Climate change constitutes a formidable, if not the most formidable challenge to mankind. Entire ecosystems will change or get obliterated, and not any single country on Earth can claim overall positive effects from Climate Change.

Worldwide, scientists have stepped up their efforts to sufficiently understand weather, climate, the chemistry of the atmosphere, the role of oceans, the biosphere and cryo-sphere. Despite the measures we fortunately take to reduce greenhouse gas emissions, climate will change. It is imperative that we understand all changes and interactions. In most sciences, observations are of foremost importance, and TROICA performs observations in a very large country indeed.

It is extremely difficult to monitor the atmosphere over a country as vast as Russia, covering different climate and geographical zones. Facing this challenge, and in line with the tradition of excellent quality and innovation in science our Russian colleagues have designed, realized and brought into operation a unique observatory named TROICA (Trans-Continental Observations into the Chemistry of the Atmosphere). TROICA enables Russian scientists to conduct regular and detailed measurements over distances of about 10,000 km.

If any science is international, it is environmental science. In this regard, the TROICA project is a fruitful international collaboration. Institutions from other countries take part based on their specific research goals and abilities in TROICA with great success. Integration of scientists, engineers and railway experts has been very successful, and it does great credit to our Russian colleagues.

Project #3949

Probiotics for Functional Foods

Institute of Immunological Engineering, Russia

By Gregor Reid

President of the International Scientific Association for Probiotics and Prebiotics
Professor, Microbiology & Immunology and Surgery, University of Western Ontario, Canada

During a visit I made to Moscow several years ago, I was very impressed by the potential in the field of probiotics and I believed that important discoveries of relevance to Russian industry and agriculture could be made. Since then I've collaborated on 3 ISTC projects, the latest of which, 'Probiotics for Functional Foods', was funded at the March 2009 Governing Board Meeting. I also deeply support the new ISTC Targeted Initiative on Probiotics as it reflects the strong and growing interest throughout the world to improve health and cure various diseases using live bacteria.

Bacteria are integral to life itself, and although Russian scientists have been pioneers in recognizing the importance of beneficial microbes, they, like the rest of the world, have slipped behind in pursuing the mechanisms involved in these effects. But there is a global re-awakening that has taken place, epitomized by the huge market growth in probiotic products, and the linear increase in peer-reviewed papers published on this topic. In the dairy industry, probiotic products are by far the fastest growing.

In the past few years, I have visited Russia, Poland, Lithuania, Ukraine, Eastern Germany, and soon Czech Republic, and in all of these former Soviet Bloc countries, probiotic research is booming. As President of the International Scientific Association for Probiotics and Prebiotics, I have seen unprecedented growth this past year, and 25 of the world's top food and pharma companies joined our organization's Industry Advisory Committee in November 2010.

The range of research is breathtaking: from brain and Central Nervous System to vital organs, the vascular system, oral, intestinal and urogenital tracts, skin and bones. My own studies are focused on women's health, pregnancy and the development of the baby, and applications to HIV/AIDS.

Given the talent of the Russian science base and the high level of education that many young Russians have attained, I would predict that implementation of ISTC's Probiotics Targeted Initiative will see many exciting developments emerge in the future.

Project #A-1321

Radioprotective and Radiorecovery Agents

Scientific Centre of Radiation Medicine and Burns, Armenia

By Carmel Mothersill

Canada Research Chair and Professor of Radiobiology, McMaster University, Hamilton, Ontario, Canada
Field of expertise: Medical Physics and Applied Radiation Sciences

The final report on project #A-1321 represents a vast amount of work. The results are very impressive and show that the researchers can take this project through from chemical synthesis to biological testing of the efficacy of potentially important radioprotective compounds. From my personal perspective, I sincerely hope this work continues and I'm very enthusiastic about collaborating in the future.

Project participants have discovered very strong radioprotective agents involving several different biological mechanisms operating in complex ways. These include DNA protective effects, manifested as an improvement in DNA melting parameters, chromatin protecting properties and anti-mitogenic activity, protective effects involving the immune system and also stimulation of the anti-oxidant system. Our collaborative research using the compounds in the radiation-induced bystander assay also showed that the compounds prevented the bystander effect – which would suggest protective effects following very low dose exposure. This is important if the agents are to be used in preventative anti-terrorist situations or around nuclear power plants.

The research group made major advances in understanding the mechanisms of action of the agents. This work now should be published in major journals. The discovery of multiple mechanisms of action following radiation exposure is consistent with modern views of radiation action involving generalized stress responses. As collaborators, we would particularly like to see the bystander effect work published.

The research group has already filed an international patent application to protect the compounds. It is likely that given their general radioprotective mechanisms, these compounds could be useful both in radiotherapy where high dose exposure causes unwanted side effects in normal tissues, but also in the radiation protection field where very low doses are of concern, due to their ability to induce non-targeted stress effects such as bystander signaling and genomic instability.

This is a highly important project that has been completed in a very professional manner. It has been a pleasure and a rewarding scientific experience being a collaborator with this excellent group. I look forward to future common work.

Project #3881

Creation of a Facility for Investigation of Nuclear Fusion Reactions

Nuclear Physics Institute, Russia

By Dr. Ralf Wilhelm Engels

Institut Für Kernphysik Jülich, Center for Hadron Physics, Forschungszentrum Jülich, Germany

Joint experimental studies of polarization phenomena in the framework of ISTC projects have been performed since 2000 by the Laboratory of Cryogenic Techniques of Petersburg Nuclear Physics Institute (PNPI), Gatchina, Russia, and the Institut für Kernphysik of Forschungszentrum Jülich (FZJ), Germany. Based on earlier experiences in the field of polarized nuclear physics, the efforts to measure nuclear polarization of hydrogen and deuterium molecules maintained after recombination of polarized atoms were started in 2000 thanks to the financial support of ISTC in the frame of project #1861. The setup, developed in the subsequent years, is still in use for common work at our institute.

The new ISTC project #3881, that started in September 2010, allows us to apply the acquired knowledge to study the cross sections of the deuteron-deuteron fusion reactions at small energy levels from 10 keV with both deuterons polarized. This data will fuel the discussions on the possibility to develop a second generation of an advanced nuclear fusion power plant based on the use of polarized fuel particles.

Contrary to the first project, the new setup is being installed at PNPI in St Petersburg. Measurements and data analysis will be performed there as well. Scientists from Jülich will join the efforts as visitors in Russia.

We are very happy that the University for Information Technology, Mechanics and Optics (ITMO) in St Petersburg has joined our collaboration. Furthermore, we are happy that H. Paetz gen. Schieck, Professor Emeritus at Universität zu Köln, also contributes as an advisor with his long-term experience in few-body polarization physics.

At the beginning of the project I was responsible for the shipment of equipment to St Petersburg leading to heavy bureaucratic formalities, but I succeeded. The only problem now standing in front of us will be the cold Russian winter, but I am sure that with the help of warm clothes, we will have further successful collaboration!

Project #3289

Biological Control of Weeds in the Krasnodar Region

All-Russia Rice Research Institute, Krasnodar, Russia (BJE)

By Dana Berner

Plant Pathologist, Foreign Disease-Weed Science Research Unit, US Department of Agriculture, Agricultural Research Service (USDA-ARS)
Field of expertise: Classical biological control of invasive weeds with plant pathogens

ISTC project #3289 was my first collaboration with a country of the Former Soviet Union. I decided to collaborate on this project because many of the invasive weeds in the USA came from Eurasia, including Russia. Discovery in the Krasnodar region of new fungal pathogens that could be used as a means to control invasive weeds seemed very likely. In Russia and the USA, invasive weeds are having catastrophic effects on agricultural, aquatic, rangeland, riparian, and natural wild ecosystems. In many cases the only economically feasible means for controlling these weeds is through the introduction and use of biological control agents, including fungal pathogens.

Through this project we have collected and evaluated over 250 fungal pathogens from 22 species of weeds. Of these, 19 pathogens were found sufficiently interesting to warrant further investigation. From these 19, two pathogens are particularly promising for biological control. One of them, the rust fungus Uromyces salsolae was found aggressive on Russian thistle or tumbleweed and, at the same time, found to be specific to this weed, i.e., does not cause disease on any other important or native plant. A petition to release this fungus for control of the weed in the USA has been submitted to regulators.

The other fungal pathogen is potentially important for Russian rice production. The smut fungus Ustilago trichophora, causes severe disease on the rice weed barnyard grass. Attempts to develop this pathogen into a biological control herbicide (mycoherbicide) are in progress with a view to using the product to control the weed in Russian rice production.

I was, and continue to be, involved in collection and evaluation of the plant pathogens along with the Russian collaborators. My input on evaluating the safety of the rust fungus has led to the petition for release in the USA, and I have helped design and implement field tests with the smut fungus. As my research focus is to discover and develop foreign plant pathogens for classical biological control of weeds in the USA, these results greatly helped my research program.

I plan to continue my work with CIS institutes because of the wealth of results that have been obtained and will likely continue to be obtained. My general impressions are extremely positive, and my Russian collaborators are now my friends. They are very warm and generous people with very good scientific backgrounds.

Projects #3431

Russian Collection of Phytopathogenic Bacteria

Phytopathology Research Institute (VNIIF), Russia

By Douglas G. Luster

Research Leader and Plant Physiologist, Foreign Disease-Weed Science Research Unit, US Department of Agriculture, Agriculture Research Service (USDA-ARS)
Field of expertise: plant pathogen biochemistry, molecular biology and diagnostics

ISTC project #3431 titled 'Collection, identification, characterization, and preservation of Russian population of phytopathogenic bacteria' is a continuation of previous projects with VNIIF institute that have resulted in the collection and characterization of hundreds of strains of bacteria. ISTC project #3431 was started in 2006 for 3 years, but was extended for another 36 months in 2009 due to the success of the work. Under project #3978, facilities for molecular techniques were renovated and used for evaluation of genetic diversity among different Russian populations of phytopathogenic bacteria.

Project #3431 has been an especially productive, resulting in 30 presentations and abstracts at international scientific meetings and 36 manuscripts, including 21 in peer-reviewed scientific journals, and 9 in international journals and books. Importantly, 4 young scientists are completing their Ph.D. courses in association with the project, and 2 scientists have received their Ph.D. degree, while 3 students are completing M.Sc. courses and preparing for Ph.D. studies. Several Russian students have visited our Fort Detrick Laboratory in the course of their studies to develop molecular characterization know-how and learn the techniques for development of diagnostic assays.

Over the life of the project, more than 2000 plants samples have been assayed for bacterial diseases, and nearly 900 new strains of important bacterial plant pathogens were isolated, identified and stored in the State Collection of Plant Pathogenic Microorganisms at VNIIF. Importantly, strains of the most widespread pathogens within the Russian Federation were added to our International Collection of Plant Pathogenic Bacteria. Several new strains of plant pathogenic bacteria with economic disease potential were identified on potato, cereals, sunflower and brassica hosts.

We are very pleased to continue collaborative projects with VNIIF and expand the scope of the work on proposed extensions of projects. We consider VNIIF to be our worldwide 'sister laboratory', and value the linkages, sharing strains and expertise in research on plant pathogens, with opportunities to train young scientists in plant pathology. The research outputs, in terms of publications, training of young scientists, and diagnostic assay development, will prove very valuable to both the U.S. and Russian Federation as we progress forward on the projects.

Project #3963

Development of a Comprehensive Approach to Study

a Structure of Thin-Film Systems St Petersburg State University, Russia

By George Kiriakidis

Associate Professor, Dr.Sc., Transparent Conductive Materials Group Leader, Institute of Electronic Structure and Lasers, Greece

Nowadays, thin-film and multi-layered coatings are widely used in microelectronics, materials science, optics, and X-ray optics and their quality is a determining factor of their effectiveness. It is important to note that thickness of coatings can be as small as fractions of a nanometer (one billionth of a meter). Studying the process of the nano and micro-film growth is vitally important for state-of-the-art technologies. The goal of project # 3963, the creation of a comprehensive technique to study nano- and micro-film structures, is very important for this field of study. So far, conventional techniques of nano- and microstructure analysis include very expensive, bulky and unaffordable sources of synchrotron radiation (electromagnetic radiation). The goal of this project is to design and manufacture an X-ray reflection chamber with spectrometer that will be much cheaper and, therefore, more accessible than conventional sources. Moreover it will be transportable and undoubtedly commercially attractive. What is very important, the chamber will minimize radiation safety concerns of X-ray reflectometry.

I am very optimistic that the issues to be studied in the Project will result in a significant contribution in the areas of fundamental and applied research in the field of modern electronics.

Interviews with upcoming Generation of Scientists

Vardan Khachatryan is a 26 year old Armenian scientist who took part in the ISTC Summer School on High Energy Physics that took place in Kazakhstan from 27 September to 3 October 2010.

What institute did you graduate from?
2001-2007, Yerevan State University (bachelor and magistracy)

2007-2010, Yerevan Physics Institute (postgraduate studies)

Where do you work currently?
Yerevan Physics Institute, junior research fellow.

The topic you work on now?
The problems I deal with are related to an experiment on Compact Muon Solenoid of the Large Hadron Collider (CMS-LHC). The Armenian group solves the issues connected with diffraction problems in the field of elementary-particle physics. In recent years, this field is of particular interest because new possibilities (e.g. LHC) enable us to find answers to open questions, for example, the study of particle structure.

What did the participation in the Summer School mean to you?
Participation in the Summer School gave me a possibility to acquire new contacts in my sphere of activity. We learned about the main problems to solve and methods to do so. It is often important to know not the exact solution of a problem, but actually to that there is a solution and where it can be found. The Summer School is – like a seed –a stimulus that supports further development.

Why did you decide to become a scientist?
When I was a child I loved to solve difficult tasks. I was especially successful in physics and mathematics. My successes continued as a university student. At that time science helped my development as a person, and it later became a way of life. As you know, all the rules are interconnected. For example, rules in mechanics and nuclear physics. Studying physics I understood that the laws of nature and the laws of our life have many things in common with the rules I met in books. Science makes my life more interesting and clear, and it makes me more flexible and disciplined in life.

What are your career plans? Which goals did you set for yourself?
I plan to move further in science, as far as my capacities allow me to go. Since I chose this path, I should use my time in the most effective way to maximize results.

What does the international scientific cooperation mean to you?
Nowadays science is being developed rapidly and becomes more expensive – this makes it inaccessible (or barely accessible) for several countries. A single research group can't be at the top in every field. That's why groups, collaborations and specialists gather together in order to solve global issues. International cooperation helps solving the unsolvable problems. Personally, collaboration gives me the possibility to contribute to modern science.

Which qualities should the modern scientist have?
A modern scientist should be disciplined, modest, reserved, quick and accurate. A scientist should be an example for the society. The aim of any scientific issue is to improve our lives. In order to understand what is better for ourselves and society, people should in their everyday life follow strict principles and rules as we do in science.

Anton Bogomyagkov is a 33 year old Russian scientist who is one of three winners in a contest for young scientists that took place in the frame of the 13th ISTC SAC Seminar "New Perspectives of High Energy Physics" held in Novosibirsk from 1-5 September 2010.

What institute did you graduate from?
Novosibirsk State University

Where do you currently work?
Budker Institute of Nuclear Physics, Siberian Branch of the Russian Academy of Sciences

What is the topic you work on now?
"Interaction Region of Super-CT Factory"

The Super T-Charm Factory is an electron-positron collider with a very high luminosity that would be 10 to 100 times more powerful than the accelerator labs at the moment in function. This collider is meant to study 'charmed mesons', which are unstable subatomic particles. This interaction region represents the part of an accelerator, where electron and positron beams are compressed to negligibly small size and collide with each other.

What does this prize mean to you?
It is satisfying because it shows that the work is judged and considered to be important.

Why did you decide to become a scientist?
When I was at school I enjoyed reading science fiction books. It influ-

enced me to study the world of elementary particles, which, as I found out, defines the fate of stars, galaxies, and the Universe as a whole. It was fascinating to dream about the stars, particles, and spacecrafts.

As Stephen Hawking said: The very small world is connected with a very big world.

What are your career plans? Which goals did you set for yourself?

The work of a scientist is a constant process of learning. I would like to continue working in my field, to be a respected professional. In the near future my plans are the following: to accomplish the project Super T-Charm Factory, and later to build this accelerator in Novosibirsk.

What does the international scientific cooperation mean for you?

International cooperation is an experience exchange and the possibility to learn about something the others have already done.

Which qualities should the modern scientist have?

He or she should be curious, be able to dream and be impressed by the difficulty and beauty of our world.

To the Marketplace

One of ISTC's main objectives is to make CIS scientists and institutes self sustainable. Many projects are funded because they provide immediate solutions to needs of society and the market. Whether in the field of biotechnologies, medicine, earth monitoring, computer systems, electronics or energy production, ISTC has provided through the years numerous examples of projects that developed novel close-to-market technologies that contribute to the economy while offering permanent civilian working places for CIS scientists.

Project #3779

Measuring the Radiation Risks Faced by Astronauts

It is now common for astronauts to live for many months aboard the International Space Station (ISS) as well completing multiple space missions during their careers. And planning for a human mission to Mars that will last over a year in duration is underway. Of high importance in the planning and design of long-term manned space flight is the effect of radiation exposure on crewmembers. Exposure to free neutrons can be hazardous since the interaction of neutrons with molecules in the body can cause various disruptions. The amount of neutron exposure in orbiting spacecrafts is much higher than on earth but depends on solar cycle, spacecraft's shielding, orbital inclination, and altitude. However, the phenomenon is not thoroughly understood largely because of a lack of precise measurement instruments.

Project #3779 lead by Khlopin Radium Institute is developing a portable high-energy-neutron spectrometer (PHENS) for real time measurement of neutron levels aboard spacecrafts. Spectrometers that are currently available provide reliable data up to 14 mega-electron volt (MeV) but spacecraft environments require up to 200 MeV to accurately assess the radiation risks. The device created by scientists of the Khlopin Institute will read between 10 and 200 MeV, therefore, providing the required level of safety assessment to the crew.

Successful results from the Project has led, in September 2010, to the signature of a contract to build the neutron spectrometer for the ISS. The contract between the Khlopin Radium Institute and the Institute for Biomedical Problems (a contractor of the Rocket and Space Corporation 'Energia') anticipates delivery to the ISS in fall 2013 to take part in the Russian experiment 'Matryoshka-R' to study the effects of radiation on vital human organs.

ISTC has invested close to $20 million in 64 projects to advance space research. Amongst many other projects, technology has been created to bring decommissioned satellites and space debris back to earth, new environment friendly rockets for spacecraft have been developed, new bio-reactors were created to grow biological cultures in zero gravity conditions and the requirements for long-term space travel, for example for use in the Mars mission, have been studied.

Preparation of the PHENS for calibration

Leading institute	International scientific collaborators	Total funds allocated	Grants
V.G. Khlopin Radium Institute, Saint Petersburg, Russian Federation	Canadian Space Agency / Bubble Technology Industries Inc. , Canada / Royal Military College of Canada / Deutsches Zentrum für Luft- und Raumfahrt, Institut für Luft- und Raumfahrtmedizin, Germany / The Svedberg Laboratory, Uppsala University, Sweden / Department of Neutron Research, Uppsala University, Sweden	$293,947	$173,975

Project #1711

Creating a New Generation of High-Tech Prosthesis

With financial support from ISTC a new generation prosthesis that lengthens limbs following severe fractures or natural deformities has been developed, built, tested and commercialized. The new ground-breaking device differs from previous prosthetics as it is fully automated, requires minimal medical supervision, is very cost effective and results for patients are optimal. The device created by a team of scientists from the Russian Federal Nuclear Center – VNIIEF, together with the Scientific and Research Institute of Traumatology and Orthopedics, promises to have a bright future.

The original prosthesis, developed through project #1711 from 2001 to 2004 demonstrated a very high potential for commercialization after positive clinical tests on patients. Therefore ISTC sponsored the Commercial Initiative CI-082 (completed in the beginning of 2011) in order to build a pilot production line with the objective to introduce the prosthesis to the Russian and CIS markets. To achieve these goals a spin off company was created in 2007, New Orthopedic Instruments to drive the project out of the labs.

In 2008, a well established US prosthetics company expressed an interest in the results of the project and both Russian and American sides agreed to use each other's know-how to develop a new generation orthopedic apparatus which could be distributed not only in Russia and the CIS but also in the US and worldwide. Software was developed to calculate the location of bone fragments so the prosthesis automatically stretches and releases the bone when needed, to obtain optimal effect and minimize pain for the patient.

Sales in the USA and the rest of the world are planned to start in July-August 2011. For Russia, production will take place at the facilities of New Orthopedic Instruments, located in Nizhny Novgorod. The production line developed through ISTC Commercial Initiative CI-082 is fully automated, does not require specialized staff to program new tasks and, therefore, will prove very flexible.

All these factors allowed the creation of 20 sustainable jobs for Russian scientists and this number is expected to increase in a near future.

Leading institute	Total funds allocated	Grants
VNIIEF, Russia / Company "New Orthopaedics Instruments", Russia	$459,000	$131,000

Project #2270

Better and Safer X-ray Diagnostics

International cooperation is often the key to successful commercialization of scientific results. In 2002, the Scientific-Production Association "LUCH", located in Moscow region, teamed up with the company Philips Medical Systems through ISTC to find solutions to improve quality and durability of X-ray technology for medical diagnostics.

The project aimed to find alternative materials to replace polycrystalline cathodes and anodes currently used in X-ray equipment because of their limited durability. The Russian experts proposed to use sturdier mono crystal alloys made out of tungsten and molybdenum, a technology developed for nuclear and space applications. The new monocrystalline materials have improved mechanical, thermal and electrophysical properties that allow better diagnostics at earlier stages while reducing the radiation dose for patients and staff.

The use of cathodes made from monocrystalline materials can be used in a range of equipment for arteriography, mammography, and in microfocus X-ray tubes, one of the most promising trends of modern medical X-ray imaging that produces very high resolution images. The obtained characteristics will be important for diagnostics of oncological diseases and in pediatrics.

Leading institute	International scientific collaborators	Total funds allocated	Grants
NPO Lutch, Podolsk, Russia	Royal Philips Electronics / PHILIPS Medical Systems, Germany	$916,149	$639,700

Project #B-1872

Turning Organic Waste into Useable Syngas

Predictions from energy experts indicate that crude oil and natural gas prices are unlikely to decrease as concerns related to the stability of energy supplies over the medium- to long-term will increase. There is now a strong trend to address environmental issues related to fossil fuels.

One such environmental concern is that conventional burning methods for the destruction of biowaste generates large quantities of by-product gases classified as POPs (permanent organic pollutants) that are restricted for emission by international agreements, such as EMEP Co-operative Program for Long-range Transmission of Air Pollutants in Europe, Stockholm Convention and others.

To counter environmental concern there has been a boom in the treatment of biomass and organic waste fuels over the last twenty years and a significant increase in support for R&D within this sector, particularly from governmental funding from sources that include the US Department of Energy (DoE) and the European Commission 'CORDIS' Programme.

Experts from the A.V.Luikov Heat and Mass Transfer Institute in Belarus, who began their work with plasma technology more than 40 years ago, are developing an industrial scale process for biomass gasification in plasma. The chemical reactor offers a more

advanced approach to organic waste treatment than conventional burning.

The reactor employs a partial combustion process to convert biomass into a combustible gas or syngas. It can then provide fuel for gas turbines or can be used as a raw material for chemical industry (for example, when producing methanol or formic acid). Biomass gasification is still in the development stage, but arc-plasma technology application promises high efficiency and may offer a valid alternative for future biowaste treatment.

An ISTC commercial Partner from Canada, High Temperature Technologies Corp, expressed its interest in funding the developments led by the team in Belarus, and the first results of their collaboration is expected towards the end of 2011.

Leading institute	International scientific collaborators	Partners
Institute of Heat and Mass Transfer, Belarus	Institute of Plasma Physics, Czech Republic /Universiteit Gent / Department of Applied Physics, Belgium	High Temperature Technologies Corp., Canada

Project #II-151

Vital Upgrades to Medical Isotope Production Facility

On 7 December 2010, ISTC project II-151, 'Upgrade of diagnostic radiopharmaceuticals facility in compliance with GMP standards', was successfully completed. As a result of the US 700,000$ investment, the Khlopin Radium Institute, located in St-Petersburg, now complies with many of the Good Manufacturing Practices (GMP) international requirements regarding radiopharmaceutical production.

The upgrades in infrastructure, equipment, quality control and personnel qualification will allow an increase in the quality of the medical isotopes and radiopharmaceuticals used in a whole range of clinics and hospitals in Russia. "In the last 20 years, over 1 million diagnostics have been carried out using the Radium Institute's production of isotopes. ISTC financial support guarantees we have the capacity to continue providing high quality radioisotopes for early detection of various diseases and health problems", asserts Leonid Solin, Project Manager and Deputy Director of Research and Production of the Isotope Division.

Apart from isotopes for diagnostics, the Institute will now be able to extend its production to therapeutic radiopharmaceuticals to treat tumors and hyperthyroidism for example. These new capabilities will increase commercial potential of the Institute as well as diversify its sources of revenue.

ISTC has funded 3 consecutive projects on nuclear medicine worth US 1,700,000$ and has been an important contributor to the Khlopin Radium Institute's R&D program with a total 77 projects funded for a value surpassing $14 million.

Equipment for automated production of radiopharmaceuticals Iodine-123

Leading institute	Total funds allocated	Grants
Khlopin Radium Institute, St Petersburg, Russia (AAT)	$700,000	$78,000

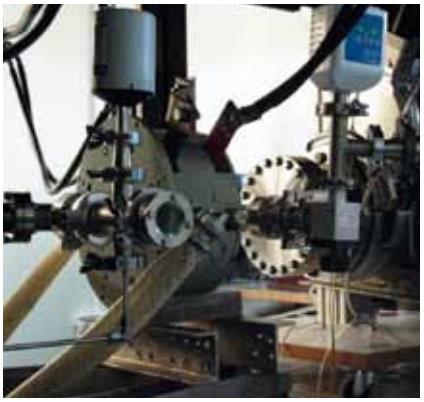
Project #3736

Highly Purified Silicon for Super Computers

Silicon isotopes with mass numbers 28, 29 and 30 have specific physical properties such as very high heat conductivity and are, therefore, ideal to produce silicon microchips of a new generation. Superlattice, which is the process of alternating extremely thin layers of silicon-28 and silicon-29 (or silicon-30), can be used as the basis for a so-called 'all-silicon' quantum computer which operating speed exceeds by millions of times the operating pace of 'classic' computers.

However, in order to create the microchips, the silicon isotopes must reach a purity of over 99.995%, a level far higher than that currently found in commercial devices. Such a level of enrichment cannot be reached with known technologies.

Techniques for fabrication of silicon powder with high deposition rate and high yield have been developed using inexpensive silicon of natural isotopic composition. Through joint work with scientific collaborators on the project, silicon crystals with sufficient degree of purity have been produced.



Plasmachemical reactor for deposition of extremely high-enriched 28Si isotope thin film

Unique techniques to create thin films were also developed. Samples of polycrystalline films with a thickness of up to 2 micrometers (one-millionth of a meter) have been created with a record-breaking enrichment level of 99.9985%. This method can be used to produce thin films of silicon with mass numbers of 28, 29 or 30.

The methodology and technologies that have been developed could be extended to the production of bulk silicon isotopes as well as Germanium. Moreover, the plasma chemical method to extract silicon from its tetrafluoride can be applied to semi industrial production of silicon as it requires less energy and the process is safer for the environment.

Leading institute	International scientific collaborators	Total funds allocated	Grants
Institute of Applied Physics, Russia	Institute for Reference Materials and Measurements, Belgium Institute of Crystal Growth, Germany. Keio University, Japan Korea Research Institute of Chemical Technology, Korea Physikalisch-Technische Bundesanstalt Germany Simon Fraser University, Canada. VITCON Projectconsult GmbH, Germany	$394,000	$214,170

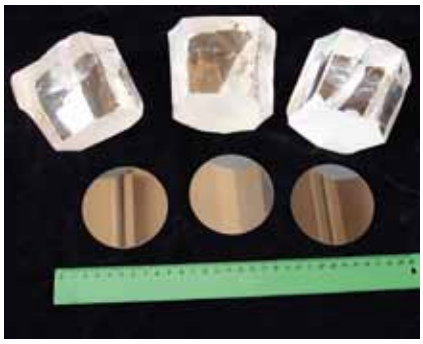
Project #3706

A New Generation of Optoelectronic Devices

Fianite is an unique synthetic crystal with no natural analogs. The name 'fianite' is derived from FIAN, the Russian acronym for the Institute of Physics of the Academy of Sciences of the USSR, where the crystals were first produced. The crystals have a unique set of properties that include a high melting point, hardness, a low volatility at high temperatures, high density, a substantial electrical conductivity at temperatures above 1200°C, and they are both acid- and alkali-resistant. A unique set of characteristics make this crystal ideal for various applications in industry.

In the framework of project #3706, a wide set of new technologies and processes have been created to develop new generation micro- and optoelectronic devices. Results have demonstrated the advantages of fianite as a novel multipurpose material. The synthesis of larger fianite crystals has been achieved and the structural perfection of the crystals and the substrates was monitored by a new method of laser defect-testing.

The results of the project are proving very timely as there is a high demand in the fields of electronics and optoelectronics. Optoelectronics is penetrating into almost all fields of human activity: science, industry, and medicine. Detectors and generators of optic radiation are very important components of computers, information processing technique, fiber-optic communication, internet and various laser optoelectronic systems and the commercial potential of the new material is the focus of future ISTC support.



Leading institute	International scientific collaborators	Total funds allocated	Grants
Institute of General Physics named after A.M. Prokhorov, Russia	Innovations for High Performance Microelectronics, Germany Institute for Energy Technology, Norway Universite du Maine, France	$470,000	$405,225

Project CI-109

Production of Ultra-highly Pure Ammonia for the Electronics Industry

Electronics and optoelectronics production in Russia has developed very quickly in the past decade. There is now a large and increasing demand for state-of-the-art electronics, especially for public use such as in street lighting and the automotive industry. The Russian Government has established a priority for LED purchase as part of its modernization and energy efficiency goals.

High-intensity, long-life span lights are based on integrated circuits and light-emitting diodes (LEDs). Until recently, these components were imported to Russia at high cost because of the high purity requirements for ammonia and no Russian company could meet such standards on a commercial basis. Ultra-high purity (UHP) ammonia of the required grade was produced mainly in industrial quantities in the US.

In 2006, the Khlopin Radium Institute in St Petersburg, refined the process and created a new technology for the purification of ammonia up to 99.99994%.

In the frame of ISTC project CI-109, with ISTC financial support the Institute's production facility was upgraded to guarantee the minimal needs of the regional market, estimated at 2000 kg/year. The institute now expects to raise its production up to 16,000kg-year in the near future as the market rapidly grows.

Leading institute	International scientific collaborators	Total funds allocated	Grants
Khlopin Radium Institute, Russia	Trion Specialty Gases LLC, USA	$510,000	$78,000

Biotechnology, Public Health and Agriculture

The drive to prevent and cure diseases that affect human beings, animals and crops is a global enterprise integrating a series of players; from universities, to research institutes, governments and pharmaceutical companies, all towards a common goal. In 2010, functional foods with immuno-boosting properties were produced, new early cancer diagnostics equipment and techniques were created, novel stem cell growth methods to rebuild damaged heart tissues was developed, a bacteria treatment to avoid antibiotics for poultry was found, new tablets were created to protect humans against radiation sources and threats, etc. Improving public health is at the heart of ISTC priorities.

Project #3808

Stem Cell Treatment for Cardiovascular Diseases

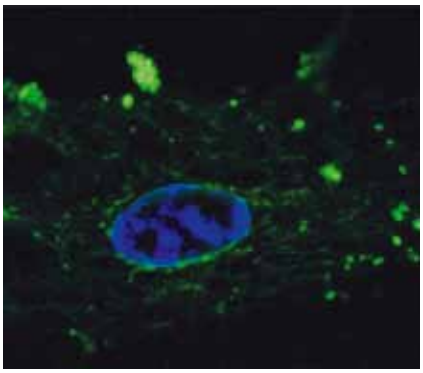
Cardiovascular diseases are one of the leading causes of mortality in industrial countries. Cell therapy, which consists in the transplantation of healthy cells to treat a disease, offers a promising treatment for healing damaged heart tissue. As a rule, every cell contains the whole genetic information needed to make every part of a person, however, only stem cells have the ability to grow and replace any damaged part of the body. Adipose tissue stem cells (ATSC), which are stem cells from fatty tissue, are known to have characteristics that help vascular growth. But in order to use ATSCs for cell therapy it is necessary to culture them in laboratories in large amounts. In order to do that we need to develop new pharmacological agents that encourage cell reproduction in culture as well as to promote cell viability during transplantation into the damaged area.

One of the main goals of project #3808 is the elaboration of a technique which could be used clinically for growing ATSCs. It was forecasted that a better growth procedure could increase the viability of stem cells, improve their ability to grow, and help their capacity to transform well into the required damaged cells.

The team of scientists supported by ISTC proved that artificially produced alfa-fetoprotein can help stem cells to transform into appropriate cells. The addition of a peptide called apocyclin has been found to enhance cell viability under specific conditions.

Improved protocols for stem cell isolation and culture as well as for stimulation of cells differentiation have been created. These protocols could significantly improve the methods for treatment of acute problems caused by cardiovascular disease.

The work has been carried out at the Institute of Immunological Engineering in Moscow region in partnership with the Moscow State University.



Fluorescent microscope photo of human fat-derived stem cells showing α-fetoprotein receptors stained green and cell nuclei stained blue.

Leading institute	International scientific collaborators	Total funds allocated	Grants
Institute of Immunological Engineering, Russia	IDI Farmaceutici, Italy University of Turku, Finland	$415,000	$314,208

Project A-1764

Effective Oral Compounds to Protect Against Radiation

Accidental exposure to radiation is of high concern to modern society as exposure can stem from various sources such as X-rays used in medicine or airports, from insufficiently protected nuclear wastes, from industrial use and also from terrorist attacks such as 'dirty bombs'. However, despite a substantial amount of research carried out in the field of chemical radioprotection during recent decades, no safe and ideal synthetic radiation protectors are currently available. As sources of possible exposure are expanding there is an urgent need to develop safe and effective means to protect human health from the hazards of unintended ionizing radiation.

The decades-long challenge of developing radio-protective agents was taken up by a research team at the Scientific Centre of Radiation Medicine and Burns in Armenia. The research focused on the synthesis of metal-containing compounds and their biological investigation as radioprotectors. They successfully created and patented compounds with many of the sought-after characteristics: low toxicity, high radioprotective efficiency for a long period and marked effectiveness following a single oral administration or injection.

The results of the Armenian experts work have been analyzed by international collaborators from McMaster University in Canada that confirmed the strong radioprotective effect of the metal-based compounds. Research outcomes were jointly presented by the Canadian Collaborator and Project Manager Margarita Malakyan at the International Congress on Radiation Research in 2007 (Armenia), 2008 (France), 2009 (Czech Republic) and 2010 (Sweden).

The end-products will find a broad range of applications in medicine and for treatment of radioactive contamination. A very promising use will be for cancer treatment to prevent damage to healthy cells during tumor radiation. The results are currently being further investigated in the frame of a follow-up project #A-1764, that began in March 2010, and focuses on potential applications of copper complexes to cancer treatment.

(See assessment of Canadian collaborator on p. 16)

Study of antioxidant activity using the photochemiluminescent method of analysis

Leading institute	International scientific collaborators	Total funds allocated	Grants
The Scientific Centre of Radiation Medicine and Burns, Armenia	McMaster University, Canada University of Arkansas for Medical Sciences, Little Rock, AR, USA (Sorenson J R)	$289,000	$237,100

Project #A-1544

Safer Radiation Detectors for Cancer Diagnostics

Terahertz radiation has a relatively low level of the photon energy that is usually damaging to human tissue and DNA. Some frequencies of terahertz radiation can penetrate several millimeters of tissue with low water content (e.g. fatty tissue) and reflect back. This imaging technique is safer and less invasive for cancer diagnostics, but it can also be used in the pharmaceutical industry for control of quality and integrity of drugs, or in medicine for microscopy detection of cell polymorphisms and DNA-analysis.

In recent years, research groups have had some success in understanding the many properties and applications of THz radiation. However, modern biomedicine needs new tools capable of working at micro- and nano-scales. To address this issue, Project A-1544 proposed to design a reliable, secure, compact, light-weight, inexpensive spectrometer based on THz technology, responding to the needs of the contemporary non-invasive biomedicine.

The research team at the Institute of Radiophysics and Electronics of the National Academy of Sciences of Armenia (Ashtarak-2, Armenia) worked closely with researchers from the University of Waterloo (Canada) and from the company T-Ray Science (Canada), to design and create a spectrometer to authenticate pills. Successful testing has been carried out on Viagra tablets, Acetaminophen and many more. A number of pharmaceutical companies from the US and Canada have already expressed interest in the spectrometer.

Furthermore, the project has developed a spectrometer for measuring parameters of biological materials. Animal meat – pork, beef, chicken, etc. have all been tested with this device and results showed that it can be used for determining meat products quality.

Investigations on identification of cancer tissues and differentiation between cancer and non-cancer tissues are currently being conducted in cooperation with the Armenian National Cancer Center.

Leading institute	International scientific collaborators	Total funds allocated	Grants
Institute of Radiophysics and Electronics, Armenia	T-Ray Science, Inc., Canada University of Waterloo, Canada	$264,000	$179,648

Project #3737

Early Detection of Colon Cancer

Colon cancer is one of the five most widespread cancers in Russia, Europe and North America with over 600,000 deaths every year worldwide. This type of cancer can take many years to develop and early detection greatly improves the chances of recovery. Project #3737 aimed to identify diagnostic and prognostic markers for the disease. The teams from the Engelhardt Institute of Molecular Biology and the Institute of Highly Pure Biopreparations, both situated in Russia, identified three genes that have a reduced expression in more than 95% of patients at early stages of the disease. Meticulous analysis of gene expression data in hundreds of samples collected by the Moscow Oncology Center clearly demonstrated the diagnostic and prognostic value of this technique to evaluate the presence of the disease and for selecting the optimal treatment.

But evaluating the gene expression is not enough; effective, easy-to-use and affordable test kits must be available, so project participants developed tools able to identify precancerous lesions and benign tumors according to gene expression detection. Patent applications are being filed on this novel technology.

This project with widespread clinical applications and obvious commercial value has been carried out in close cooperation with international collaborators from the Microbiology and Tumor Biology Center in Sweden.

Leading institute	International scientific collaborators	Total funds allocated	Grants
Engelhardt Institute of Molecular Biology, Russia	Karolinska Institute, Sweden	$320,000	$214,900

Project #3445

Bacteria to Replace Antibiotics in the Fight Against Poultry Infections

World-wide poultry production for meat and eggs is a multi-billion dollar industry that continues to grow with human population needs. Traditionally, to control dangerous bacterial infections at large poultry production facilities antibiotics are used but, in recent years, antibiotic resistant pathogens have started to appear within poultry populations. This has not only caused important losses for poultry producers, but has also lead to antibiotic resistant bacterial pathogens entering our food supply causing food poisoning illnesses and death in the most sever cases. To meet this challenge Russian scientists at the State Research Center for Applied Microbiology & Biotechnology in Obolensk and scientists from of the United States Department of Agriculture Agricultural Research Service (USDA ARS) have teamed up via of a number of ISTC projects that focus on finding new substances to combat bacterial pathogens of poultry.

As a result, Russian scientists discovered a group of naturally occurring substances called bacteriocins produced by non-pathogenic bacteria that kill a range of bacterial pathogens including the most deadly poultry pathogens Campylobacter and Salmonella. As part of their international collaborative efforts scientists precisely characterized the different bacteriocins, discovered and tested their efficacy in protecting poultry from infection.

In addition, the US Partner helped protecting the Intellectual Property produced by the Russian and US scientists. More recently, negotiations have been initiated with three large multinational companies for the licensing rights to commercially use bacteriocins. Thus, more than 10 years of research and development collaborations between Russian and US scientists under the management of ISTC projects have resulted in innovations that can reduce agricultural losses and food borne illnesses.

Leading institute	International scientific collaborators	Partners	Total funds allocated	Grants
State Research Center for Applied Microbiology and Biotechnology, Obolensk, Russia	IDI Farmaceutici, Italy University of Turku, Finland	United States Department of Agriculture / Agricultural Research Service, USA US Department of State / FSU Bio Industry Initiative, USA	$998,909	$499,060

Project A-1563

Nano Particles to Treat Tumors

Over the past four decades, scientists have led intensive research on cancer with a certain degree of success in understanding the disease, but without any major breakthrough in treatments. Most of the time doctors are forced to rely on standard chemotherapy and radiation, which can do nearly as much damage to the patients as they do to the tumors. Therefore a decrease in toxicity of treatments is an important component in the development of new directions of chemotherapy. Nanotechnology brings a new set of tools to treat cancer in a more targeted way and could prove the breakthrough in treatment long anticipated.

ISTC project # A-1563 proposes a multidisciplinary approach to drug discovery bringing together physicists, chemists, biologists and oncologists. Effective antitumor zinc oxide nanocompositions have been obtained revealing a significantly higher antitumor activity and lower toxicity on mice. Preliminary results are positive and further work will be undertaken in the scope of the project to further decrease the toxicity of novel composites.

Leading institute	International scientific collaborators	Total funds allocated	Grants
State Engineering University of Armenia, Armenia	Queen Mary, University of London, UK University of Cambridge, UK University of Central Lancashire, UK University of Dublin, Ireland University of Oxford, UK	$264,000	$205,000

Project #4000

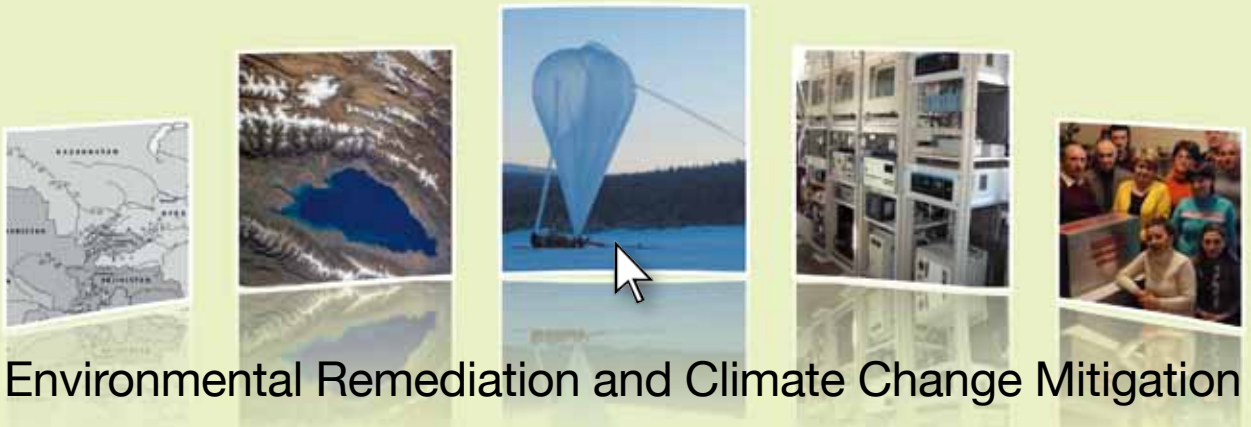
Functional Foods for Stronger Immune Response

Functional food or medicinal food is a new trend in the food industry looking for health-promoting or disease-preventing properties beyond the basic function of supplying nutrients. Research to develop food with specific beneficial properties for health is intensifying worldwide as the demand from consumers for such products is on the rise. Scientists from Russia, Georgia and CIS are at the forefront of research in this field and ISTC channeled some of the available talents into the Targeted Initiative on 'Probiotics and Health', created in 2009.

ISTC project #4000, 'Functional Nutrition Synbiotic Products', has developed a beverage made from fermented milk and brown algae that can be found on the Pacific coast of Russia. Synbiotic products are a functional food combining the positive effects of probiotics on the small intestine and prebiotics on the large intestine. The research is being carried out at the Institute of Epidemiology and Microbiology together with the Pacific Institute of Bioorganic Chemistry, in Vladivostok.

The major innovation in the Project consists in using probiotic bifidobacteria in combination with biologically active substances derived from sea hydrobiont Fucus evanescens, a common algae growing in shallow waters near the coast of the Kuril islands, in Kamchatka, in Primorsky region and Sakhalin. The combination of these ingredients has demonstrated through clinical trials antiviral, anti-inflammatory, and antitumor properties as well as general stimulation effects on the immune system. Patients with gastrointestinal diseases should benefit from the product as well as healthy people looking to supplement their diet to strengthen immuno-biological response of the body.

Leading institute	International scientific collaborators	Total funds allocated	Grants
Institute of Epidemiology and Microbiology, Siberia, Russia	Kyorin University School of Medicine, Japan	$300,000	$177,740



Environmental Remediation and Climate Change Mitigation

Environmental projects make up the second highest number of ISTC's past and present project funding and collaborations. ISTC has focused project development and funding on environmental monitoring, remediation and mitigation of climate change effects. Various types of monitoring should be carried out in order to understand changes taking place in the environment. Atmosphere, oceans, rivers, and soil constantly interact to keep a fragile balance between elements and ISTC projects offer a better understanding of these processes.

Project #3093

Understanding the Processes of Climate Change

Ozone and water vapor are greenhouse gases that play a key role in tempering the earth climate. While most water vapor is found in the lower part of the atmosphere (the troposphere), ozone is concentrated in the layer above (stratosphere). Between the troposphere and the stratosphere ozone and water interact and chemical reactions occur that influence the climate but the mechanisms of this interaction remain unclear. Project #3093 investigates the processes controlling the water vapor and ozone in the atmosphere, which are the most essential factors for climate prediction.

To explore an area located over 10 km above sea level, the Central Aerological Observatory (CAO) created a light and compact optical hygrometer (instrument to measure humidity) called FLASH-B (picture below) placed on a balloon exploring the lower stratosphere. Observations were carried out in Siberia, Costa Rica and West Africa in the course of the project. It is important to monitor data from tropical areas as this is where the atmosphere gorges itself with water vapor. Comparing the data with cold climates then helps understand the movement of air masses and thus weather prediction.

The instruments created in the framework of the project are now used by international collaborators to monitor the atmosphere from different places on the globe.

Preparation of balloon in Northern and tropical climates

Leading institute	International scientific collaborators	Total funds allocated	Grants
Central Aerological Observatory, Russia	JAXA / Earth Observation Research Center, Japan National Institute for Environmental Studies, Japan	$458,500	$263,275

Project #2270

A Laboratory on Wheels to Monitor Environment on Eurasian Continent

Global climate change could take a catastrophic turn in the next decades, radically changing the world we live in, according to a 2007 report of the International Panel on Climate Change (established by the United Nations Environment Program). These changes would greatly affect the Northern Eurasian continent. Long-term meteorolog-

ical observations in northern latitudes have already documented an increase in air temperature in the boreal forest and tundra, along with growing levels of greenhouse gases, melting permafrost, higher concentration of contaminants, and degradation of ecosystems.

In order to draw the right conclusions about climate changes and their sources, in depth monitoring should be carried out with state-of-the-art instruments. Russia and the CIS, as part of the network of Global Atmospheric Watch, were lagging behind in this area and new equipment had to be procured and monitoring projects had to be launched in order to keep track of the changes occurring on the Eurasian continent. Data was important for Russia and neighboring countries, as well as for the global scientific community.

Recognizing this problem, ISTC, along with international research partners from Germany, USA, Finland, Austria, Norway, Japan, and South Africa contributed to the pioneering work of the Institute of Atmospheric Physics based in Russia. ISTC projects # 2770 (completed in 2010) and # 2773 (completed in 2009) proposed in depth monitoring of the lower atmosphere, as well as water, soil, and vegetation. This unique study was made possible by equipping a train with tools and sensors for a ride deep through Russia, from extreme south in the Caucasus, to northern Barent Sea in Murmansk, ending in Far East Vladivostok. The project included six long routes - two West-East, and four North-South trips.

The measurements provided by the mobile laboratory were correlated with those of a 300 meter high tower, built through another ISTC project in the heart of Siberia 500 km north of Krasnoyarsk. The combined analysis provided better understanding of boreal ecosystems, carbon balance in a changing climate, and transport of contaminants in clean regions of Siberia and the Arctic Circle.

The results were successfully demonstrated at international exhibitions and at the St-Petersburg Economic Forum.

Mobile Laboratory in the wagon of a train

Leading institute	International scientific collaborators	Total funds allocated	Grants
Institute of Atmospheric Physics, Moscow, Russia	Max-Planck Society, Germany	$375,000	$218,904

Project #KR-1371

Integrating the Kyrgyz Atmosphere Monitoring Station into International Networks

The atmosphere monitoring station 'Issyk Kul', located on the shore of the lake of the same name, 1600 meters above sea level in the mountains of Kyrgyzstan, is unique as it is the only station that has been continuously measuring and analyzing gas species in Central Asia since 1978. Up until now, it remains the only station of complex atmospheric observations in the Central-Asian region. The nearest of such kind would be on Mt Waliguan in China, about 2000 km to the East.

In 1998, the station was ageing and its Soviet era equipment would only measure a limited set of gases, thus preventing the station from fully participating in international programs. It was at this time that ISTC funded Project KR-157 (1998-2001) and subsequently KR-763 (2002 – 2006) to modernize and automate the 'Issyk Kul' station to allow real-time measurements of ozone and other greenhouse gases such as: water vapor, carbon dioxide, stratospheric nitrogen dioxide, methane, nitrogen protoxide, carbon oxide, sulfur dioxide. These upgrades permitted "Issyk Kul" station to participate in a range of regional and international networks of observation such as: Global Atmosphere Watch (GAW), Network for Detection of Atmospheric Composition Change (NDACC) and Aerosol Robotic Network (AERONET) created by the NASA.

The most recent project, KR-1371, completed in 2010, allowed a full integration of the station into the main international monitoring networks. As a result of the three ISTC Projects, continuous observations of the principal radiation-active and climate forming gases and aerosols are now carried out from Kyrgyzstan.

View of Issyk Kul lake from space

Leading institute	International scientific collaborators	Total funds allocated	Grants
Kyrgyz State National University, Kyrgyzstan	Kyorin University Sch Kyoto University, Japan / Universite de Shebrooke, Canada / University of Maryland at Baltimore, USA US Department of Commerce / Climate Monitoring and Diagnostics Laboratory, USA ool of Medicine, Japan	$391,560	$227,082

Project #K-1296

Transboundary Management of A River Basin in Central Asia

Syr Darya River, running through Central Asia, is known in medieval Islamic writings as 'Sayhoun' after one of the four rivers of Paradise. It takes its source in two headstreams located in Kyrgyzstan and Uzbekistan, in the Tian Shan Mountains and flows West on a 2000 km journey through Kazakhstan and pouring itself in the remains of the Aral Sea. As many countries are involved in the drainage basin, pollution and misusage at any of its points affects the rest of the system.

Therefore, in 2000, Kyrgyzstan, Uzbekistan, Tajikistan and Kazakhstan agreed to collaborate on monitoring Syr Darya river basins through the international project 'Navruz', together with US Sandia National Laboratories joining in 2005 as a scientific collaborator on the project. Over 15 monitoring checkpoints were identified in each country involved (60 in total). Water, bottom sediments, plants and coastal soils have been sampled and analyzed.

A high level of contamination with natural radionuclides has been revealed in the Syr Darya river basin on the territory of Kazakhstan, mainly related with the high stock of uranium in the region. High concentrations of toxic elements have also been detected at some points related to industrial facilities of Shymkent city. Moreover, high concentrations of artificial radionuclide have been discovered in the soil near the underground nuclear test site "Meridian-3".

A modeling system was created in the frame of the project to better understand water balance and pollution transportation in the river basin. A database publicly available at (https://waterportal.sandia.gov/centasia) gathers all information about water discharge, ecological and radio-ecological data of the Syr Darya river basin.

The model of water balance has been used in modeling of spatial-temporal responses of the Syrdaria River to potential disturbances of water flows coming from neighboring countries, helping to better manage the sensitive resource.

Leading institute	International scientific collaborators	Total funds allocated	Grants
National Nuclear Center of the Republic of Kazakhstan, Kazakhstan	Sandia National Laboratories, USA	$350,000	$192,500

Project #3770

Acoustic Equipment for Large Scale Ocean Monitoring

Ocean currents greatly affect the Earth's climate and weather by transferring heat from the tropics to polar regions, and transferring warm or cold air and precipitation to coastal regions where winds may carry them inland. Therefore, to understand and forecast changes in weather and climate, it is important to develop effective and reliable methods and tools for continuous monitoring of oceanic temperature and mass flows in key areas of the ocean. Ocean Acoustic Tomography is a technique used to measure temperatures and currents over large regions of the ocean. The technique relies on precisely measuring the time it takes sound signals to travel between an acoustic source and the receiver, separated by ranges of a hundred to thousands of kilometers.

The most promising application of this technique is for research in the Arctic Ocean, where other conventional methods are too costly or inapplicable and satellite observations are unreliable due to the ice cover.

The effectiveness of remote acoustic monitoring of the ocean depends to a great extent on the development of new acoustic monitoring technologies. Project #3770 developed a powerful parametric sonar antenna prototype that could monitor a distance up to 1000 km. This antenna, which works on the principles of nonlinear acoustics, can provide a signal in a frequency range from 300 Hz to 3000 kHz. The antennas provide high accuracy of data on long routes and in complex oceanographic conditions. The pulse type and high directionality of the emissions make the antenna much safer for marine life compared to traditional acoustic radars with similar characteristics.

Full scale testing will be carried out in the Black Sea in 2011 in collaboration with project collaborators from Nansen Environmental and Remote Sensing Center (Norway) and the Institute of Applied and Computational Mathematics (Greece).

It is planned to include the prototype in ocean monitoring programs of the European Union to study global climate changes and ecosystems.

Leading institute	International scientific collaborators	Total funds allocated	Grants
Federal State Unitary Enterprise, Russia	Foundation of Research and Technology, Greece Nansen Environmental and Remote Sensing Center, Norway	$505,000	$307,010

Project A-1524

A Novel Multi-Sensor to Monitor the Environment

Armenian scientists from the ECOSERV Remote Observation Center have created a novel sensor for remote monitoring of soil, vegetation, snow, surface water and atmosphere composition all at once using a dual-frequency radar-radiometer system. The system analyses a broad range of wavelengths from 1 to 60 GHz (L to K bands) allowing monitoring from close range on the ground to long range from airplanes. The results of these studies can have important socio-economical impact as the new sensor has a very broad range of applications, such as for agriculture, forestry, irrigation, water resource management, environment's preservation and protection, sustainable control and monitoring, border security, and many other related fields.

More concretely, different tasks and analysis can be accomplished by the developed technology: soil and snow moisture analysis, wind speed and direction on sea surface, sea water temperature and salinity, identification of potential mines, surface pollution, atmospheric turbulence, rain and hail clouds analysis, etc. In the near future, the largest reservoir of fresh water in the Southern Caucasus, Sevan Lake, will be monitored. Hail clouds will also be observed in real time to predict and minimize agricultural losses.

The sensor system can be used as a complementary tool for satellite data calibration and validation. Project participants have already started to collaborate in various international satellite monitoring programs.

Team of developers with multi-sensor

Leading institute	International scientific collaborators	Total funds allocated	Grants
ECOSERV Remote Observation Centre Co. Ltd., Armenia	Friedrich-Wilhelms-Universitat Bonn, Germany Universitat Stuttgart, Germany	$417,300	$323,250

Nuclear Technology

Nuclear and particle physics are omnipresent and they could provide explanation to the very origins of the universe. And fields of application are constantly broadening as risks of nuclear technologies are being kept in check by the advancements of science. Medicine uses it for diagnostics and treatments, industry for oil and gas exploration, food industry to eliminate harmful microorganisms, and so on. Nuclear power generation is constantly evolving in order to develop safer, cleaner and efficient technologies to answer ever growing energy needs. Nuclear physics, whether fundamental or applied, has traditionally been an important area of research for ISTC.

Project #3965

Understanding the Origins of the Universe

The neutrino is a particle so abundant that about one hundred billion pass through an area the size of a post stamp every second, yet it is so weakly interacting with matter that the probability of interaction as it passes through the earth is infinitely small. The recent discovery that the neutrino changes type as it travels through space, a phenomenon referred to as neutrino oscillations, means that neutrinos have a tiny, but non-zero mass. The implications are far reaching, for example, neutrino interactions may be responsible for the removal of all the anti-matter created in the Big Bang from the early Universe and the neutrino may have played a crucial role in the birth of the Universe itself.

Knowledge of the contribution of neutrinos in these areas needs precise measurements of the parameters governing neutrino oscillations. Three different technologies have been proposed to study neutrino behavior: the Neutrino Factory, the Super-Beams and the Beta Beam. Through ISTC project #3965, Russian scientists are developing, manufacturing and testing a gyrotron and a magnetic trap for the Beta Beam neutrino facility. The prototypes created through ISTC project will be used to validate the Beta Beam as a source of radioactive isotopes.

The research will be carried out jointly by the Institute of Applied Physics (Russia), CNRS (France), and CERN (Switzerland) along with a range of other European, American, Canadian, Indian, and Israeli institutes. The Organisation for Economic Co-operation and Development (OECD) noted that international collaboration is vital on neutrino research. The work is being carried out in the framework of the EURONu program that started on 1st September 2008 and will run for 4 years.

Project manager Prof. Zorin with Partners Dr. Debray and Dr. Lamy from (CNRS).

Leading institute	International scientific collaborators	Total funds allocated	Grants
Institute of Applied Physics	CERN, Switzerland / Consiglio Nazionale delle Ricerche / Instituto di Fisica del Plasma, Italy / Laboratoire National des Champs Magnétiques Intenses, France	$931,000	$491,985

Project #B-1732

Reducing the Toxicity of Nuclear Waste

Used fuel from conventional nuclear power reactors contain a number of radionuclides, most of which decay rapidly, but a significant proportion of the wastes contained in used nuclear fuel are long-lived radioactive elements. In recent years, interest has grown in the possibility of separating the long-lived radioactive waste from the used fuel and transmuting it into shorter-lived radionuclides so that the management and eventual disposal of this waste becomes easier and less expensive.

The transmutation of long-lived radioactive waste into short-lived ones can be carried out in an accelerator-

driven system (ADS), where neutrons are injected into wastes to force further fission, thus creating energy and reducing radiotoxicity of fissile material. In the last decade, a lot of analytical studies were published on the subject but these systems were not tested because the required technology did not exist. ISTC project B-1732 aimed to create and demonstrate the validity of such new technology.

A Belarusian team of scientists designed and built a subcritical assembly with neutron accelerator, the 'YALINA-Booster', at the Joint Institute for Power&Nuclear Research-Sosny, in the Minsk region. The initial core of the reactor was functioning on 90% high-enriched uranium-235. With modifications brought through the project, the enrichment level was gradually brought down to 36% and then to 21%. The project results confirm the validity of using low-enriched uranium fuel instead of high-enriched uranium in a subcritical regime without a fall in performance.

Minimizing and eventually eliminating the use of highly enriched uranium in nuclear power reactors is at the heart of international non-proliferation efforts and this project provides the tools to reach this goal. Cooperation with US Argonne and Idaho National Laboratories is ongoing, with the support of the International Atomic Energy Agency (IAEA) and the EU, to further study the physics and kinetics of accelerator driven subcritical systems using low enriched fuel. The methods developed and tested at YALINA facility will be used in the European nuclear energy projects GUINEVERE and MYRRHA.

IAEA meeting on YALINA Benchmark, India, February 2010

Leading institute	International scientific collaborators	Total funds allocated	Grants
Joint Institute of Energy and Nuclear Research, Belarus	Argonne National Laboratory, USA	$500,000	$398,200

Project #815

Minimizing Risk in Nuclear Power Production

Ensuring the criticality of a nuclear reactor is one of the biggest challenges in physics and reactor theory. A nuclear reactor is in a critical state when the fissile material reaches a self-sustaining reaction chain and provides a steady power level. Insufficient fissile reaction is called subcritical state and the opposite would be supercritical. For reasons of safety and efficiency, benchmarks have to be created to predict behavior of fissile material in different conditions and environments. Computer theoretical results are tested in experimental reactors and if theory and results coincide, benchmarks are created to be peer reviewed internationally. New benchmarks reduce the gap between available and acceptable levels of uncertainty

ISTC has supported a number benchmarking projects, the results of which have proved of high value to industry and experts alike. Project #815's goal was to minimize the risks of supercritical accidents with nuclear materials during management, transport, and short or long-term storage. Results were published in the International Handbook of Evaluated Criticality Safety Benchmark Experiments (ICSBEP). The ICSBEP Handbook contains results of numerous criticality experiments conducted in various countries (mainly in the United States, Russia, France, Great Britain, and Japan).

Project #815 started in 2001 and the quality of results and methods led to multiple extensions of the project until its final completion in 2010. The project itself (together with projects, #3110, #3579, #3814, and with the previously performed #2582, #1808, etc.), represent millions of dollars invested by the international community through ISTC to address the issue of global nuclear safety.

Critical rig, Obninsk

Leading institute	International scientific collaborators	Partners	Total funds allocated	Grants
Institute for Physics and Power Engineering named after A.I. Leypunsky (IPPE), Russia	AEA Technology, UK	IRSN - Institut de Radioprotection et de Surete Nucleaire, France / Lockheed Martin Corporation USA / Oak Ridge National Laboratory, USA	$1,008,565	$780,853

Technical Solutions to Enforce Global Security

During the past ten years, the ISTC has advanced global security by engaging scientists of the CIS in research aiming to find technological responses to various threats to society, might it be terrorism, forensics, border protection, or monitoring solar flares that could badly disrupt electronic devices on earth and in space.

Project #A-1554

Limiting the Damage of a Major Solar Storm

Modern societies have grown increasingly dependent on electronics to function on a day to day basis. A world without cell phones, computer systems, GPS navigation, etc, is hardly conceivable nowadays. Violent solar storms are a serious threat to contemporary lifestyle as they can cause major failures onboard spacecraft, aircrafts, satellite communication, electric power grids and all electronic devices that we use every day. Space weather specialists are forecasting a very strong solar flare around 2012-2013 that could paralyze many developed countries for days, weeks, even months in worst case scenarios.

NASA specialists underlined that it is important to quickly start implementing a system to prevent some of the most damaging consequences of solar flares. Effective monitoring of solar activity is the first step and ISTC has funded near to $1.5 million at the Yerevan Physics Institute to build a network of particle detectors called SEVAN to monitor geophysical parameters such as fluxes of the cosmic rays, geomagnetic and electrical fields and broad band radio emissions. The institute developed and built new particle detectors, computers, data integration systems, and laboratories at the summit of Mount Aragats at 4000 meters above sea level to avoid interference and obtain higher precision of results.

The network of particle detectors can predict upcoming geomagnetic and radiation storms hours before the arrival of Interplanetary Coronal Mass Ejections (ICMEs) to the earth surface, allowing enough time for safety measures to be put into place to protect critical infrastructure. Because of the relatively low cost of the equipment, it is planned to deploy the technology in Croatia, Slovakia, Costa Rica, Bulgaria, Indonesia and India, additional to existing facilities in Armenia. This network, combined with data from satellites, will provide more reliable and more time sensitive data on space weather.

Project participant working on a particle detector

Leading institute	International scientific collaborators	Total funds allocated	Grants
A.I. Alikhanyan National Science Laboratory, Yerevan, Armenia	Forschungszentrum Karlsruhe Technik und Umwelt, Germany University of Leeds, UK / US Department of Commerce / Space Environment Center, USA	$860,000	$493,500

Project #3534

Russian Scientists Create Detector Against Dirty Bombs

Detecting fissile material, explosives and other illegal chemicals among thousands of containers in ports, freight depots or airports places heavy demands on security enforcement agencies and governments responsible for protecting civilians and infrastructure from terrorist attacks. The challenge nowadays is to tackle security issues without disrupting the flow of merchandise coming in and out of countries. The increase in inspections at borders has resulted in millions of dollars of new expenses for companies shipping goods across the world. Quick, efficient, and affordable detection technology is, therefore, a priority need.

Russian scientists might have cracked the code and developed a detector that could identify dirty bombs even if shielded by lead, which would make them invisible to traditional detectors. A team from the Khlopin Radium Institute in St Petersburg developed, with ISTC support, a neutron-based technique for penetrating containers and

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“Our detector is probably the only one at the present that can provide automatic identification of suspicious objects without handling them. Any other technique such as high energy X-ray technology would depend on the operator’s skills or have a prohibitive price tag”, explains the Project Manager, Andrey Kuznetsov.

To date, similar detectors required very strong, high-cost neutron generators and shielding to protect the personnel, which is not the case with the new technology because the neutron emission is about 1000 times weaker than other existing devices.

Detector of hazardous materials scanning through container with hidden illicit material

Leading institute	International scientific collaborators	Total funds allocated	Grants
Khlopin Radium Institute, Russia	Bubble Technology Industries Inc., Canada Kyoto University, Japan Lawrence Livermore National Laboratory, USA Oak Ridge National Laboratory, USA University of Padova , Italy	$515,000	$258,000

Glossary of Main ISTC Terms and Programs

Bio-safety/Bio-security Program is aimed to provide 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 scientists, engineers and their organizations to improve basic skills needed to create, maintain and develop self-sustainable business and commercialization of technologies.

Counter-Terrorism Program aims to provide scientific and technological support for counter-terrorism and law enforcement.

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 other countries of the CIS member states.

Mobility Program is aimed at providing additional possibilities of direct communication of the Russian and other 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 projects between the private sector and institutes in Russia and other CIS member countries.

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

Science Workshop and Seminar Program is aimed to promote the integration of ISTC beneficiary institutions and scientists and engineers into the international 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, proposes new directions for project activity, and evaluates ongoing projects on behalf of the ISTC Governing Board.

Targeted Initiatives

A number of targeted initiatives were created to provide a focused approach and technical solutions to a number of topical problems of global interest.

- Drug Design Development
- Fuel Cell
- Law Enforcement
- Probiotics Health
- Science Technology in the Prevention of Biological Threats
- Scientific and Technical Support against the Illicit Trafficking of Nuclear and Radioactive Materials
- Technical Support for IAEA Advanced Safeguard and Verification Development Program
- Ultra-High Intensity Light Science and Technologies

ISTC Project Map


ISTC PROJECT LOCATION
CIS CAPITALS WITH ISTC PROJECTS
ISTC PROJECTS LOCATED IN MOSCOW REGION
Bolshie Vyazemy
Chernogolovka
Dubna
Dolgoprudny
Elektrostal
Fryazino
Khimki
Korolev
Lyubertsy
Lytkarino
Lyubuchany
Nemchinovka-1
Obolensk
Podolsk
Protvino
Puschino
Ramenskoye
Serpukhov
Shatura
Shcherbinka
Troitsk
Zelenograd
Zhukovsky
Bilibino
Yakutsk
Angarsk
Irkutsk
Krasnokamensk
Petropavlovsk-Kamchatsky
MONGOLIA
Vladivostok
REPUBLIC OF KOREA
JAPAN
CHINA

Promoting CIS Science and Technology

The ISTC 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 that are available through working with the ISTC and scientists in Russia and the CIS. These activities include participation at major international trade shows, scientific and technological exhibitions or conferences, the 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, Partner 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 activities, assist the integration of former Soviet Union WMD experts into the international S&T community and to engender 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 2010, ISTC supported or organized over 50 events in Russia and other ISTC- member states of the CIS and Georgia, as well as in Canada, the European Union, Japan, Republic of Korea and the United States.

ISTC Involvement in Promotional Events and Science Workshops/Seminars in 2010

14-19 February	Nano Tech 2010	Tokyo, Japan
01 March	EU-Russia forum	Moscow, Russia
24 - 26 March	Globe Environmental Technologices Conference	Vancouver, BC, Canada
01 April	Technology Push Event: Tre-seed stage of technologies promotion	Tomsk, Tomsk reg., Russia
01 April	Final Workshop AERONET	Brussels, Belgium
April - May	22nd ISTC-Korea Workshop	Korea
06 - 09 April	Conference on "Commercialization R&D results - International Experience"	Moscow, Russia
06 - 09 April	The 5th International conference on chemistry and chemical education "Sviridov Readings-2010"	Minsk, Belarus
12 - 13 April	Addressing the Issue of Potential Terrorism and Guarding Against WMD in Central Asia	Dushanbe, Tajikistan
13 - 15 April	EC FP7 EVA Project Workshop	Moscow, Russia
13 April	National System of Biological Screening is organized in the frame of 2nd EuroBioasiaforum	Moscow, Russia
14 April	Meeting with the Congress of Industrialists	Moscow, Russia
19 - 23 April	Hannover Messe 2010	Hannover, Germany
22 - 23 April	International Conference EU-RUSSIA/CIS on Technologies of the Future: Spain - ISTC/STCU Cooperation	Madrid, Spain
26 - 27 April	Workshop "Space debris mitigation"	Moscow, Russia
01 May	Law Enforcement Targeted Initiatives: Research and Identification of Illicit Objects by Methods of Mass-Spectrometry	Moscow, Russia
02 - 09 April	ISTC Scientific Workshop. Title: 1st Russian Greece Symposium with International Participation and School of Young Scientists "Biomaterials and bio-nanomaterials: recent advances and toxicology issue"	Iraclion, Greece
10 - 13 May	53 JWS "Earthquake and Volcanic Eruption Monitoring and Disaster Mitigation in North Pacific region"	Sapporo, Japan
24 - 25 May	Joint NIAID-ISTC Workshop on Research Opportunities in TB Drug Discovery and Diagnostics	Moscow, Russia
29 May - 03 June	54the JWS "Life-threatening infections and its treatment - construction of Japan-Russian medical research cooperation"	Tokyo, Japan
31May - 04 June	International Conference "Contemporary state and development prospects of microbiology and biotechnology"	Minsk, Belarus
07 - 09 June	Joint NIAID-ISTC Conference on Bioinformatics Tools and Techniques for Allergy and Infectious Diseases Research	Moscow, Russia
29 June - 02 July	UK-Russia Space Research Seminar	London, UK
15 - 19 June	International Seminar "Optical Techniques and Nano-tools for Material and Life Sciences" (ONT4MLS-2010)	Minsk, Belarus
28 June - 02 July	International Conference "Catalysis for the processing of renewable raw materials: fuel, energy, chemical products"	Saint Petersburg, Russia
30 June - 02 July	Int'l Bio Forum and Bio Expo Japan	Tokyo, Japan
08 - 09 July	Workshop Worldwide early warning system of volcanic activities and mitigation of the global/ regional consequences of volcanic eruptions'	Moscow, Russia
13 - 20 July	IV International Conference "Frontiers of Nonlinear Physics"	Nizhny Novgorod, Russia
24 - 27 July	Research of probiotics of the Caucasus region - towards the secret of "longevity" and Probiotics conference held by Japan Society for Lactic Acid Bacteria	Sendai, Japan
September - October	23rd ISTC - Korea Workshop and Exhibition participation	Korea

September - October	Technology Push Event. Venture Funding of spin-off companies resulted from the ISTC projects	London, UK
01 - 05 September	13 SAC Seminar "New Perspectives in High Energy Physics" in cooperation with European Organization for Nuclear Research (CERN), Geneva, Switzerland with the assistance of Budker Institute of Nuclear Physics of Siberian Branch of Russian Academy of Science (BINP SB RAS)	Novosibirsk, Novosibirsk reg., Russia
01 September	STPBT TI Workshop "Prevention of Biological Threats to the Food Supply Chain"	Ottawa, ON, Canada
01 - 03 September	Bio Korea 2010 Exhibition and Business Forum	Seoul, Korea
06 - 09 September	10th International Conference on Gas in Marine Sediments	Listvyanka, Irkutsk, Russia
07 - 11 September	Counter-Bio Terrorism in the Food Supply Chain	Ottawa, Canada
11 - 16 September	World Energy Congress	Montreal, QC, Canada
15 - 18 September	International Congress of Industrialists Presidium Meeting an International Conference "Eurasian Economic Space: Cooperation, Integration and Development"	Tallinn, Estonia
15 - 16 September	Atlantic Conference on Eyjafjallajokull and Aviation	Keflavik Airport, Iceland
22 September	ISTC-DANONE Scientific Cafe on the Benefits of Probiotics	Moscow, Russia
22 September	Special ISTC Sessions in the framework the International Conference "ConSoil -2010"	Salzburg, Austria
23 - 25 September	The Workshop "Terahertz Technology in Biomedical Applications"	Yerevan, Armenia
27 September	The Summer School for Young Scientists on the Theme of High Energy Physics and Accelerator Physics	Astana, Kazakhstan
October	Modern genetics in health care system	Yerevan, Armenia
01 October	Russian Venture Forum	Saint Petersburg, Russia
01 October	TI Probiotic Workshop	Armenia
01 October	Round table on International Cooperation	Astana, Kazakhstan
03 - 05 October	STS Forum - Science and Technology in Society Forum	Kyoto, Japan
05 October	ISTC Executive Director Awarded a Golden Honorary Medal for Services to Research and Innovation in Armenia	Yerevan, Armenia
05 - 07 October	The International Workshop "Managing Risks in Aquatic Systems: Effects of Climate Change on Anthropogenic Activity"	Ontario, Canada
05 - 08 October	The International Workshop "Modern genetics in health care system"	Yerevan, Armenia
10 - 15 October	"8th Regular German-Russian-Ukrainian Symposium on Fluorine Chemistry"	Zvenigorod, Russia
16 October	Kyrgyz-Japan Workshop on Photonics and Information Technology	Iwate, Japan
17 - 19 October	Science Workshop "Neuroplasticity: Nervous Substrate for Health and Diseases" through the ISTC	Tbilisi, Georgia
19 October	Kyrgyz-Japan joint Workshop on Photonics and Information Technology	Morioka, Japan
25- 28 October	The Fourth Work Meeting of CBM-MPD STS Consortium "CBM and MPD Silicon Tracking Systems - 2010: "A roadmap for production"	Darmstadt, Germany
26 - 27 October	Seminar "Twenty years of supply Radium Institute radiopharmaceuticals to medical institutions of Leningrad – Saint Petersburg"	Saint Petersburg, Russia
28 - 29 October	IV International Conference and Exhibition "AtomEco – 2010"	Moscow, Russia
01 - 06 November	ICMAR 2010	Novosibirsk,
01 November	Practical US-RF Seminar "Technology Entrepreneurship"	
01 November	Seminars on WEB TV regime for researches from CIS countries on problems of R&D commercialization results	
01 - 06 November	15th International Conference on the Methods of Aerophysical Research (ICMAR 2010)	Akademgorodok, Novosibirsk, Russia
10 - 12 November	2nd Annual Conference Biosafety Association for Central Asia and the Caucasus "Regional Biosafety and Biosecurity Collaboration"	Bishkek, Kyrgyz Republic
10 - 13 November	1st Commercialization Reactor	Riga, Latvia
21 - 26 November	24th ISTC-Korea Workshop	Korea
01 - 03 December	ISTC – Lappeenranta Innovation Event	Lappeenranta, Finland
20 December	Current Trends and Problems in Healthcare Management	Moscow, Russia

Competency Building Program

The program aims to support scientists and experts to improve their skills needed to develop and implement commercialization projects. The following courses and seminars were provided by ISTC in 2010.

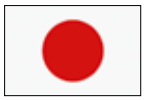
01 November 2009 - 30 March 2010	Transportation of Infectious Substances, Animal Biosafety and Facilities, Serological Methods of Investigation	Almaty, Kazakhstan
November 2009 - April 2010	Biosecurity and Biosafety: Principles and Practices	Bishkek, Kyrgyzstan
December 2009 - April 2010	Transportation of Dangerous Goods Workshop	Bishkek, Kyrgyzstan
25 December 2009 - 30 April 2010	Implementation of Biorisk Management Standards in Microbiological Laboratories	Serpukhov, Moscow reg., Russia
17 - 19 February 2010	Training on Business administration for Sarov specialists	Sarov, N. Novgorod reg., Russia
22 - 25 February 2010	Bilateral meetings German authorities	Berlin, Germany
February - April 2010	Training “Business plan development”	St. Petersburg, Russia
April 2010 - January 2011	#28 Development of the Manual on Especially Dangerous and Zoonotic Diseases	Almaty, Kazakhstan
07-08 April 2010	Conference TOP2010. ISTC section “Knowledge management”	Moscow reg., Russia
14 April - 11 June 2010	Long term training "Knowledge and Technology Management"	Yerevan, Armenia
May 2010 - January 2011	#30 Inventory and Certification of BSC's in the Kyrgyz Republic Workshop	Kyrgyzstan
17 May – 17 July	Complex long term training on innovation business	Krasnodar, Russia
4 September – 12 November	Complex long term training on innovation business “Investment projects evolution methods”	Dushanbe, Tajikistan
5-9 September	Training “Investment projects evolution methods”	Issyk-Kul, Kirgizia
11 October – 10 December	Training “Intellectual property”	Vladivostok, Russia
11 October – 22 December	Long term training “Knowledge and technology management”	Moscow, Russia
October 2010 - January 2011	Facilitating Participation and Interaction at the 2nd Annual BACAC Conference	Bishkek, Kyrgyzstan
15 November – 15 December	Complex long term training on innovation business “Investment projects evolution methods”	Tbilisi, Georgia
December 2010 - March 2011	#33 Inventory and Certification of Biosafety Cabinets in Kazakhstan	Almaty, Kazakhstan
December 2010 - May 2011	#35 Inventory and Certification of Biosafety Cabinets	Tajikistan
December 2010 - March 2011	#34 BSC Certification management Workshop KSCQZD	Almaty, Kazakhstan

ISTC Structure

Permanent Governing Board Parties


Canada


European Union


Japan


Russian Federation


United States

Other Parties


Norway


Republic of Korea

CIS Parties


Armenia


Belarus


Kazakhstan


Kyrgyz Republic


Tajikistan (Board Member in 2010)

Non CIS Party


Georgia

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 Kazakhstan in 2011.

The Coordination Committee representatives are appointed by the Parties and meet prior to Governing Board meetings to review details of proposals 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	Andrew Shore
European Union	Marcus Cornaro
Japan	Manabu Miyagawa, Masaki Sugamiya
Russian Federation	Lev Ryabev
United States of America	Victor Alessi

Members of the Scientific Advisory Committee:

Japan	Jun Sugimoto
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

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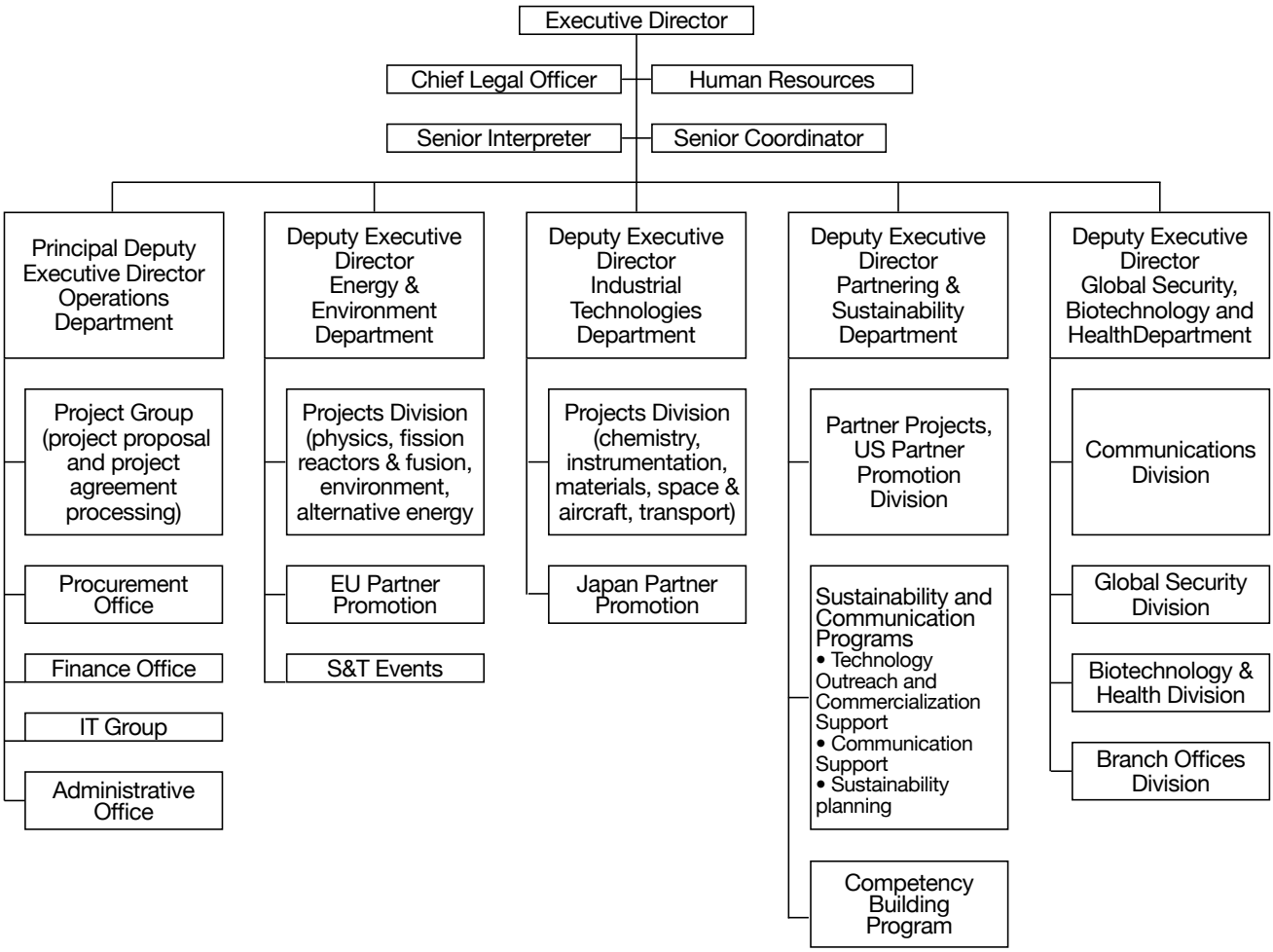

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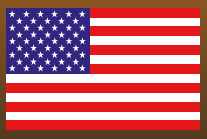

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