I S T C

International Science & Technology Center

ANNUAL REPORT

CONTENTS

Dear Partners and
Friends of the ISTC,

In November 2002, the International Science and Technology Center marked the 10th anniversary of the signing of the Agreement that laid the foundation for a new model of international cooperation in nonproliferation and world security.

During these 10 years, the Center and its Partners have provided nearly $500 million in grants, equipment, travel and training support for peaceful fundamental and applied research projects. These projects have engaged more than 51,000 scientists and engineers from almost 700 institutes, research centers and production facilities, using many of the best scientists from not only Russia and the CIS, but also many foreign collaborators from Japan, the Republic of Korea, Norway, the European Union, and the United States. At the ISTC in Moscow and its regional offices in Armenia, Belarus, Georgia, Kazakhstan, and the Kyrgyz Republic, more than 160 associates work together to provide dedicated support and assistance to project participants and ISTC Partners.

The ISTC has become an efficient tool for matching the needs of world industry with relevant expertise in Russia and the CIS. The pool of ISTC Partners, which includes major scientific organizations and many leading private sector companies, is expanding as industry leaders discover research and technology development in Russia and the CIS.

We at ISTC wish to extend our sincere gratitude to all those who have supported and are supporting the ISTC nonproliferation mission and contributing to its peaceful, cooperative scientific efforts.

Thank you,
ISTC Staff

I S T C

М Н Т Ц

ISTC – Accomplishing Its Objectives

The objectives of the ISTC are to:

- Provide weapons scientists in the CIS the opportunity to redirect their talents 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 CIS states into the global scientific community
- Contribute to solving national and international technical problems

NONPROLIFERATION THROUGH SCIENCE COOPERATION

The International Science and Technology Center (ISTC) was established by intergovernmental agreement in November 1992.

In 2002, ISTC accomplished:

- New science project funding for 249 projects in the amount of $84.6 million. Of this, $40.8 million for 94 projects was provided by ISTC Partners.
- Direct grant payments to 25,857 scientists and their team members, amounting to $39 million. Total redirection supported by the ISTC in 2002 is equivalent to 7,690 full–time person–years.
- Addition of 31 new Partner organizations, who have provided over $110 million in project funding since program inception.
- Expanded funding for seminars, workshops, and scientist travel, to strengthen international exchanges on ISTC projects and programs.

Partnership through the ISTC addresses initiatives from government agencies and programs, private industry, international organizations – strengthening scientist–to–scientist exchange, and promoting long–term integration and mutual benefits for all participants.

STATEMENT FROM THE EXECUTIVE DIRECTOR

The year 2002 saw significant progress in the development of the Mission and the operations of the International Science and Technology Center. The Parties through the Governing Board have confirmed the Mission of the Center in recognition of its valuable practice and experience in contributing to the nonproliferation of knowledge needed for the development and production of weapons of mass destruction. Scientific cooperation managed by the Center has created mutual trust and understanding between the Parties and the Scientific Communities of concern. The Parties to the ISTC, and more importantly the scientists themselves, have benefited from the results of trust building cooperation. They are prepared to share responsibility and join in partnership their efforts and ideas to minimize the risk of misuse of scientific knowledge. The Center has evolved to Partnership – a future model for international cooperative science programs targeted on Nonproliferation. And the growing threat of global terrorism has made the Center Mission and its evolution to Partnership even more important and urgent.

With the reaffirmation of its Mission, the Secretariat was instructed by the Governing Board to adjust its programs and its organization. The focus of ISTC programs has to reflect the improvements made in the Russian Federation and the Newly Independent States. These improvements are essential for the organization of Partnership, which will also help to realize mutual benefits for all Parties and Partner organizations. Mutual benefits are the key for ongoing, growing international cooperation and thus essential for sustainable ISTC results. Three major changes in the ISTC Secretariat will support the operational evolution to Partnership: the implementation of a programmatic, targeted approach for cooperative science and technology projects; the creation of a Partner Department, which will attract and service industry and public organizations as part of the ISTC Partner Program; and the streamlining of ISTC service functions to improve efficiency.

The staff of the ISTC Secretariat has met these challenges. We could agree on a new organization and new procedures which will help us to become more competent in Science and Technology Program management, to be proactive and customer oriented in recognition of Partner objectives, and to work as professionals according to international best practices. The Parties and the management of the Secretariat highly appreciate this great commitment to serving our Mission, which will help us promote safe and peaceful global Partnership.

Michael Kroening

Prof. Dr. Michael Kroening was born in Weixdorf/Dresden, Germany, and received his Ph.D. in experimental nuclear physics from the Johannes Gutenberg–University in Mainz in 1974. Dr. Kroening has held positions of Research Scientist at the Max Planck Institute for Chemistry, and headed quality assurance research at Siemens AG – Kraftwerk–Union in Erlangen. In 1990, he was appointed Director of the renowned Fraunhofer–Institut for Nondestructive Testing IZFP and named Professor at the University of Saarbrueken as Chair of Nondestructive Testing and Quality Assurance. He was member of the German Reactor Safety Commission RSK until 1999. His professional memberships include the scientific advisory board of the German Society of Nondestructive Testing, Chairman of the advisory board of Q–Net GmbH. Dr. Kroening is an Honorary Fellow and Professor at several societies and universities in the Russian Federation and India.

Dr.Ronald F.Lehman II, the Chairman of the Governing Board of the ISTC, is the Director of the Center for Global Security Research at Lawrence Livermore National Laboratory. Previously he was the Director of the U.S.Arms Control and Disarmament Agency, Assistant Secretary of Defense, Chief START Negotiator, and Deputy Assistant to the President of the USA.In 1995 he was named to the President's Advisory Board on Arms Proliferation Policy.

STATEMENT FROM THE CHAIRMAN OF THE ISTC GOVERNING BOARD

The Parties to the International Science and Technology Center (ISTC) seek to benefit humanity through cooperation in the advancement of science and technology. Thus, the value of the ISTC grows as science becomes more intensely international. Ideas, resources, and talent now move rapidly across borders. Information technology is further reducing the barriers of time and distance as academic and industrial organizations are increasingly networked and decentralized. By integrating the resources and comparative advantage of institutions around the globe, many projects once thought impossible are now underway. And all science benefits from the multidisciplinary synergism and inspiration made possible by working with the best science and technology, no matter where it is located.

In troubled regions of the world, however, the great promise of science for enhancing prosperity, freedom, and security is threatened by the proliferation of weapons of mass destruction – nuclear, biological, chemical. The Parties to the ISTC recognize that international security issues are deeply imbedded in modern technology. Much important technology is inherently "dual use," applicable to violent as well as peaceful uses. Modern societies are enhanced by advanced technology, but populations and infrastructure remain vulnerable to technology attacks from hostile actors including terrorists. With the dangers of weapons of mass destruction expanding to include technology–empowered terrorism, governments seek more ways to cooperate in coping with new challenges.

The International Science and Technology Center offers important insights into science cooperation on behalf of international security. The ISTC remains focused on its mission of nonproliferation, but it offers broad tools for advancing science, defense conversion, economic growth, environmental mitigation, and other common objectives. The ISTC offers an international organization with an intensely intergovernmental process that permits its diverse membership to come together to address overlapping

needs. It is an open organization that can deal responsibly with sensitive personnel, technology, and facilities.

The ISTC provides an umbrella framework for engaging industry, academia, government agencies, and NGOs while promoting best practices and protection of intellectual property. It offers branch offices to communicate locally, and it provides secure funding to be a significant catalyst. With nearly $500 Million spent thus far and funding now reaching some 26,000 scientists each year, the ISTC funds the equivalent of more than 7,500 full time scientists a year in Armenia, Belarus, Georgia, Kazakhstan, the Kyrgyz Republic, the Russian Federation, and soon Tajikistan. The European Union, Japan, Norway, the Republic of Korea and the United States each contributes and benefits as well.

History is likely to record 2003 as a year of great transformation in the relationship between science and international security. Whether this change will be more positive than negative remains an open question. In this context, the ISTC has become a vital prototype for future international science cooperation on sensitive grand challenges involving the environment, energy, counter–terrorism, and commerce as well as nonpro–liferation. The ISTC is also changing. With European Union expansion, membership could someday involve perhaps 40 nations, and the transition to partnership implies more shared burdens and benefits. Partners' projects may exceed direct gov–ernment funding, putting more weight on commercialization and meeting the newest international standards and best practices.

The members of the Governing Board join me in expressing our appreciation to the Parties and to ISTC personnel at the Moscow Headquarters and in the Branch and Regional Offices for their efforts to meet the new challenges. They have taken important steps to strengthen ISTC policy, procedures, and staff. The ISTC is not a large organization, but it has been influential precisely because it works well in the inter–est of all the Parties.

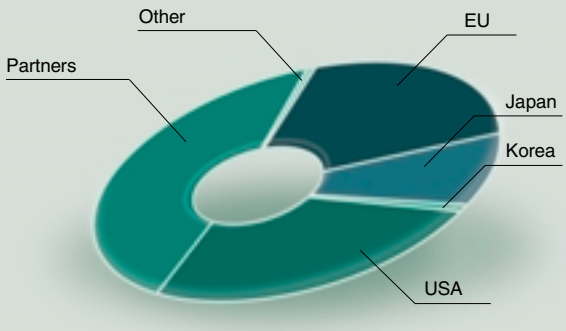
Ronald F. Lehman II

2002 FINANCIAL SUMMARY

To fulfill its nonproliferation mission, the ISTC Parties, Partners, and project Collaborators contribute financial, in–kind, and human resources to the Center. These resources are used to engage weapons scientists and technical team members in peaceful scientific projects through the Science Project and Partner Programs. Additionally, the European Union, Japan, United States, Norway, and the Republic of Korea contribute to the Center Administrative Operating Budget and other ISTC programs that support nonproliferation. For detailed information, refer to the audited Financial Statements.

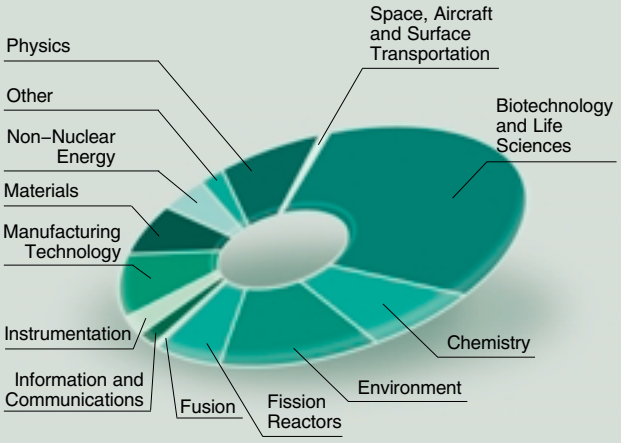
New Project Funding by SOURCE

Party	Amount
EU	$16 040 842
Japan	$6 163 324
Korea	$242 850
USA	$21 073 710
Partners	$40 833 294
Other	$237 296
Total:	**$84 591 316**



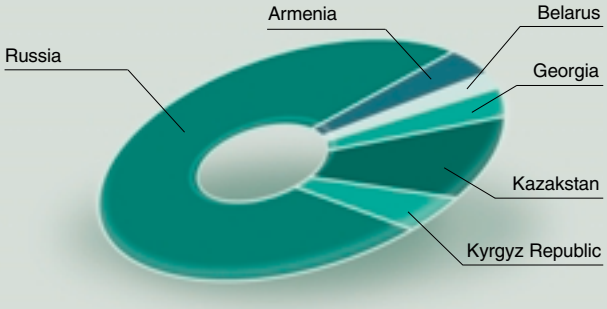
New Project Funding by TECHNOLOGY AREA

Tech area	No. of projects	Allocated funds
Biotechnology and Life Sciences	56	$25 015 406
Chemistry	21	$5 344 726
Environment	40	$9 906 820
Fission Reactors	19	$6 143 615
Fusion	2	$340 000
Information and Communications	8	$2 171 211
Instrumentation	11	$3 329 771
Manufacturing Technology	14	$10 439 705
Materials	25	$7 394 789
Non–Nuclear Energy	10	$4 129 018
Other	8	$2 139 971
Physics	32	$7 784 614
Space, Aircraft and Surface Transportation	3	$451 670
Total:	**249**	**$84 591 316**



New Project Funding by
LOCATION OF LEAD INSTITUTE

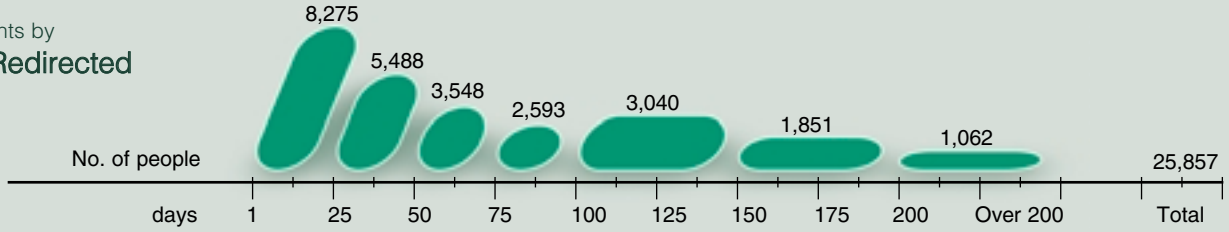
Country	No. of projects	Allocated funds
Armenia	15	$3 232 527
Belarus	6	$1 703 028
Georgia	15	$2 695 388
Kazakstan	19	$6 855 434
Kyrgyz Republic	11	$3 007 997
Russia	183	$67 096 942
Total:	**249**	**$84 591 316**



Participants Redirected to ISTC Projects in 2002

The ISTC paid **25,857** project participants **US$39,018,234** in grant payments for a total of **1,691,672** person–days of effort on ISTC projects in 2002.

Participants by
Days Redirected



Participants by
Country / Region

Region	Number of people
Armenia	1162
Belarus	682
Georgia	961
Kazakhstan	1,690
Kyrgyz Republic	338
Russia / Moscow	8,319
/ St.Petersburg	1,915
/ Chelyabisk	1,760
/ Novosibirsk	1,452
/ Nizhny Novgorod	3,960
Others	3,618
Total:	**25,857**

Persident Akayev and Prof. Kroening discussing cooperation between the ISTC and Kyrgyz scientists

ISTC welcomes Academician Pyotr Vityaz to the Governing Board in 2002

2002 OFFICIAL EVENTS

- The 23rd Meeting of the ISTC Scientific Advisory Committee was held at Epochal Tsukuba Congress Center in Tsukuba, Japan.
- The Executive Director was received by the President of the Kyrgyz Republic, Mr. Askar Avayev, for discussions on Kyrgyz national priorities in science and technology.
- The ISTC Governing Board held its 27th meeting at State Residence “Ala Archa” in Bishkek, approving 61 projects representing $17 million in funding. The Governing Board welcomed Piotr Vityaz, First Vice President of the National Academy of Sciences, to represent Belarus on the ISTC Governing Board.
- The ISTC visited the Republic of Korea to promote Korean participation in ISTC programs. The ISTC delegation was welcomed by the Vice–Minister of Science and Technology, Mr. Yoo, and was hosted by several major industry groups including the Korea Industrial Technology Association.
- The 24th Meeting of the Scientific Advisory Committee was held at the Russian Scientific Center of Applied Chemistry (RSCAC) in St. Petersburg, Russia.
- The Republic of Tajikistan announced its intention to officially accede to the ISTC Agreement.
- The ISTC Executive Director met with Mr. Luk Hermans, Dutch Minister for Education, Science and Research in Moscow for discussions on international science programs.

- On the occasion of Denmark assuming the European Union Presidency, the ISTC welcomed the Head of the European Union delegation in Moscow, Mr. R. Wright and the Ambassador of Denmark to the Russian Federation, H.E. Lars Vissing, for discussions on EU programs and coordination with the ISTC.

- The ISTC conducted it 28th Funding Session, approving 34 projects representing over $10 million in funding.

- The ISTC Governing Board approved the accession of the Republic of Tajikistan to the ISTC Agreement.

- The ISTC welcomed a delegation from the Science and Technology Center in Ukraine, including its new Executive Director, Mr. Yves Carmel.

- The Executive Director visited Kamchatka, Russia at the invitation of the Far East Branch of the Academy of Sciences.

- The ISTC welcomed a delegation from Canada for discussions on accession to the ISTC Agreement.

- The ISTC Governing held its 29th meeting at the ISTC Headquarters in Moscow, approving 60 new projects representing $18 million in funding.

- The Royal Danish Embassy in Moscow hosted the ISTC Governing Board delegations at a reception dedicated to the 10th anniversary of the ISTC Agreement.

- The ISTC participated in the Nonproliferation and Disarmament Cooperation Initiative and European Nuclear Cities Initiative conferences in Brussels, Belgium.

Head of EU delegation and Ambassador L. Vissing at the ISTC Headquarters

ISTC delegation visiting the Korea Research Institute of Standards and Science

Science Project Program

The Science Project Program is the most comprehensive nonproliferation activity conducted by the ISTC. Through this program, the ISTC solicits scientific project proposals from institutes throughout the CIS and provides funding and logistic support to project teams. Project teams receive written concurrence from the host country on whose territory their research will be conducted, and then develop and execute their project with foreign collaborating organizations. Foreign collaborators ensure that the project goals contribute to the state–of–the–art in the field, and results will find applications to real problems in basic and applied research. The ISTC has funded hundreds of project teams through this program and directed the efforts of over 51,000 CIS researchers to peaceful science.

Terms for participation in the ISTC Science Project Program are codified in binding Project Agreements signed by the ISTC and CIS institute management. Based on the Project Agreement, grant payments and equipment for project research are provided free of taxes and import duties to the CIS scientific teams. Project Agreements also stipulate terms for monitoring and auditing of the project and site, to ensure adherence to the financial and technical goals set out in the Agreement. The ISTC Secretariat and Parties' representatives regularly participate in monitoring project progress.

MSU chemists – participants of ISTC Projects 0589 and 1567.

Activity in 2002

Projects were reviewed and approved at three (3) funding sessions, allocating $44 million to 155 projects.

Financial audits were conducted on 248 projects (including 210 final audits and 38 annual audits) through on–site ISTC staff visits to 386 institutes (337 institutes for final audits and 49 institutes for annual audits).

A total of 36 projects were audited by the US Defense Contract Audit Agency, for a total of 57 site visits. The audited projects funded/co–funded by the Department of State included 23 project in Russia, 2 projects in Armenia, 2 projects in Kazakhstan, and 2 projects in the Kyrgyz Republic. The majority of projects audited were accompanied by technical experts from Pacific Northwest National Laboratory, Lawrence Livermore National Laboratory, NASA Glenn Research Center, NASA Kennedy Space Center, George Washington University, US Army Biological Arms Control Treaty Office, Defense Threat Reduction Agency, and Department of Health and Human Services.

25,857 scientists and their technical team members were paid for at least one day of activity on ISTC projects; average number of days team members worked on an ISTC project: 65.

Intellectual Soil

Every day millions tons of dust rise in the atmosphere and travel with the wind, sometimes affecting areas hundreds and thousands of kilometers away. Dust is a menace enough in itself, but it becomes many times more dangerous when it originates from sites subjected to radioactive or chemical contamination. Scientists from All–Russian Scientific Research Institute of Non–Organic Materials (VNIINM) and from the Department of Chemistry of the Moscow State University in the framework of the ISTC Project # 0589 found an efficient solution to prevention of soil erosion and spread of contaminated dust.

In close collaboration with their colleagues from the Los Alamos National Laboratory and the Japan Atomic Energy Research Institute, Russian scientists invented and tested a polymer that turns ordinary soil intellectual. A liter of this polymer sprayed over 1 square meter of soil forms a 3 mm thick protective layer that not only prevents further erosion, but ensures favorable conditions for normal development of vegetation and soil microorganisms. The polymer is based on a combination of differently charged polyelectrolites and a substance (potassium nitrate or other mineral fertilizer) that prevents polyelectrolites from premature adhesion. After spraying, the mixture saturates the upper layer of soil, and as rain dissolves the fertilizer, polyelectrolites and soil particles stick together forming a strong protective crust, which still allows water and air to penetrate treated soil. Moreover, these polyelectrolites have another notable feature: they are capable of swelling in water. Thus, protective crust absorbs water from dew or mist, and becomes a source of moisture for the soil below it.

Field test proved that polymer–protected «intellectual» soil is no longer vulnerable from erosion and becomes much more fertile than untreated areas. Presently, VNIINM and MSU scientists are working on a follow–up ISTC Project # 1567 aimed at further improvement of protective polymer characteristics. Says Project Manager S. Mikheykin of VNIINM Bochvar: «The ISTC grant enabled us to develop the protective crust technology and a method to apply both the polymer and grass seeds to the soil. This considerably speeds up formation of strong and healthy sod. But apart from funding the research, the ISTC support has helped us to fulfill another major task: to preserve our scientific team in a challenging financial situation, and to re–direct weapons scientists to solution of ecological problems.»

An Airborne Laser to Protect Environment

Industry analysts estimate that up to 10–15% of natural gas transported in overland pipes leaks into the atmosphere. A cost–effective remote method to detect and pinpoint leaks would provide significant cost savings and help protect the environment. Such technology was developed and a device was designed and built by former nuclear weapons developers at VNIIEF(Sarov).

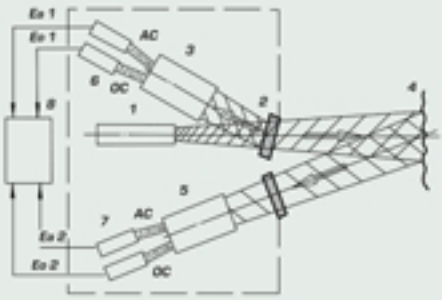
The VNIIEF technology applies a powerful DF laser to detect leaks from the air while the gas is flowing. The presence of methane, ethane, propane, butane and other accompanying gases is recognized by means of differential absorption. The measuring system is built to withstand conditions on–board a light airplane or automated hot–air balloon. A laboratory prototype of the analyzer was constructed, assembled, and tested under the scope of the ISTC project #0142 funded by the United States and the European Union. When the project was successfully completed, the ISTC targeted this technology as having high commercial potential and began its promotion to potential strategic investors.

In 2001, the ISTC identified a California company interested in commercializing the technology and creating a joint venture with VNIIEF. The business model envisioned is that the California firm will dedicate its fleet of small aircraft to over–flying pipelines as a service business; VNIIEF would provide continuing R&D, manufacturing and maintenance. The initial stage of the partner project for manufacturing a flight prototype was registered at the ISTC in September 2002.

Together with its strategic investor, the VNIIEF team is investigating other industrial applications of the DF Laser and Differential Absorption Analyzer technique. Examples include remote detection and monitoring of: infestation and/or identification of flora in agricultural or forested areas, measurement of depth and area of oil spills, and other hydrocarbon marine pollutants.

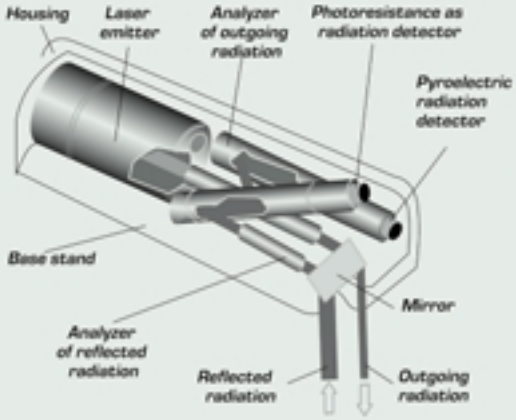
FUNCTIONAL DIAGRAM OF THE MEASURING SYSTEM OF LASER MONITORING AND GENERAL VIEW OF THE INSTALLATION

FUNCTIONAL DIAGRAM OF MEASUREMENTS



1, laser unit;
2, beam splitter;
3, unit for sensing outgoing signal;
4, ground relief;
5, receiver of reflected signal;
6 and 7, photodetectors;
8, unit for mathematical treatment of signals

GENERAL VIEW OF THE INSTALLATION



RFNC VNIIEF

Laser Monitoring for Pipelines

Partner Program

The Partner Program provides opportunities for private industry, scientific institutions, and other governmental or non–governmental organizations to fund research at CIS institutions via the ISTC. Partners benefit from the ISTC infrastructure which permits tax–free direct payments to CIS project teams and duty–free import of project equipment. CIS institutes and project teams benefit from their close cooperation with foreign Partners and the application of their technical skills to important and current scientific and industrial problems.

Summary of Advantages available to ISTC Partners:

- Established ISTC project management infrastructure
- Exemption from all taxes and customs duties on payments and imports
- Direct payments in US$ to project scientists
- Financial control and regular audits, in compliance with GAAP
- Project agreements stipulating rights and privileges of the Partner and Institute
- Host government support and pre–approval for projects
- Strict protection of business confidential information

New Partner organizations are introduced to the ISTC by the ISTC Party on whose territory the Partner is located. Full information on becoming an ISTC Partner is available from the Parties, ISTC Secretariat, and is located on the ISTC website.

Activity in 2002

Forty–one (41) new Partner organizations joined the ISTC;
total Partners at the end of 2002: 176
Full list of ISTC Partners is available at the ISTC web site.

Ninety–four (94) Partner projects representing $40.8 million were approved for funding.
Total Partner contribution since program inception exceeds $113 million.

Georgian Arsenic Goes Hi Tech

On May 26, 2002 the Research and Production Complex (RPC) «Electron Technology» of Iv.Javakhishvili Tbilisi State University was honored by a visit from the President of Georgia, Mr. Eduard Shevardnadze. The scientists of the RPC used that opportunity to present to the high guest their latest achievements in fundamental and applied research much of which is supported through a number of international programs.

ISTC Project Manager Dr. N. Khuchua describing her work to President Shevardnadze

RPC «Electron Technology» specializes in semiconductor devices and Gallium Arsenide integrated circuits, and has been participating in ISTC programs since 1994.

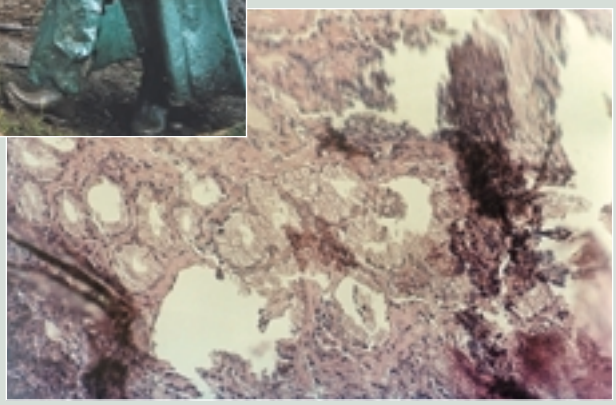
In the framework of their latest ISTC project # G–801 Georgian scientists together with their German partners from Fraunhofer Institut fuer Zerstoerungsfreie Pruefverfahren (IZFP) work on X–ray and microwave sensors to be used in nondestructive testing equipment. Direct–converting X–ray sensors are the heart of rapidly developing digital radiography. And GaAs–based microwave sensors are much more efficient compared to other available sensor systems for non–destructive testing. Once the project has been completed, RPC «Electron Technology» will be able to manufacture these sensors for commercial application.

It was noted during President Shevardnadze's visit that this international effort goes perfectly in line with the long approved concept of adding a final hi tech product component to the Georgian arsenic production and processing industry. It also meets the ISTC objectives of integrating CIS former weapons scientists into the world scientific community and supporting their transition to the market–based economy.

ISTC Supports International Research in Paleobiology

Members of the Japan–Russia expedition

A mammoth bone recovered at the site



Undamaged cells discovered in the mammoth tissue

Russian and Japanese scientists have successfully completed the first phase of the ISTC Project # 2491p «Study of Macro– and Microorganisms Excavated from Permafrost». The Project envisions complex research in order to find mammoth remains and new products of the microorganisms' metabolism that might be used in biotechnology, medicine, and agricultural plants protection. In summer 2002, an expedition comprising scientists from several research centers of Gifu Province (Japan), State Research Center VECTOR and Institute of Applied Ecology of the North (Russia), as well as the ISTC, conducted excavations in the permafrost area north of the city of Yakutsk (Sakha Republic, Russian Federation). The expedition retrieved numerous remains of a mammoth including two frozen legs with flesh, skin and hair, and took samples of the permafrost soil for further research. To prevent melting and deterioration of tissue, the legs were immediately transported from the site to Yakutsk. At present, Japanese and Russian scientists are studying the possibility of using the genetic material in the frozen mammoth tissue for the cloning of this long extinct animal. Scientists at SRC VECTOR have already found a certain amount of undamaged cells in the recovered remains that theoretically are suitable for somatic cloning.

Soil samples are being studied for the possibility of isolating saprophytes. Psychrophilic microorganisms living in low temperature conditions could help researchers solve quite a number of technological problems, from developing new low temperature detergents to fighting oil spills in northern areas, where cold weather greatly reduces efficiency of bacteria normally employed for the purpose. It is planned to set up an accessory collection of microorganisms at the VECTOR Research Center for the subsequent careful study of the isolated saprophytes.

Supporting Programs

Seminar Program

The ISTC organizes and conducts seminars toward heightening the awareness of CIS scientific potential, maintaining strong international scientific cooperation between foreign and CIS scientists, linking scientific potential with technology markets, and establishing cooperation with other international organizations and programs. Seminar topics are of broad technical and global interest and support the objectives of the Center and of other international nonproliferation initiatives.

Activity in 2002

International Seminar "Accelerators of Particles and Nuclei: Past, Present and Future (ISAPAN–02)" dedicated to the memory of Acad. Veksler.

Date: 4–6 March 2002
Place: Dubna, Moscow Region (Russia)
Budget: $15,000

The international scientific seminar "Accelerators of Particles and Nuclei: Past, Present and Future (ISAPAN–02)" was initiated and organized by the Director of the Joint Institute for Nuclear Research to honor the 95th anniversary of the distinguished Russian scientist in the field of accelerator physics and physics of elementary particles, Academician Vladimir Veksler.
About 200 participants from Russia and abroad attended the event. Among them were representatives of large scientific centers such as CERN, DESY, FERMILAB, Brookhaven, institutes from the JINR member–states and scientists, who had worked with Acad. Veksler.

The Seminar was opened by the introductory speech of the Chairman of the Program and Organizing Committee, Director of Joint Institute for Nuclear Research, Academician V.G.Kadyshevsky. He outlined that discovery by V.I.Veksler of the phase stability principle may be characterized as the turning–point in the development of the accelerator's science, after which it became clear how to build–up particle accelerators, to reach in the laboratory conditions the particle energies as high as seen only in the cosmic rays before. This introductory speech was followed by several presentations devoted to the results of the successful realization of Veksler's ideas, which gave a new breakthrough in the accelerator technique.
The main part of the seminar program was devoted to particle physics. The representatives of the JINR Bogolyubov's Laboratory of Theoretical Physics presented large–scale appreciation of the theory of elementary particle strong interaction; the state of the art of the nucleon structure problem and the prospects of its studies; evaluation of the discoveries, that had been made and influenced the development of that field of science.
The seminar brought together scientists, who had actively worked with V.I.Veksler, and representatives of the younger scientific generation, which in itself was extremely useful and interesting.
The seminar reports and presentations dealing with elementary particle physics and experimental methods of registration of particle interactions outlined the historical perspective of those scientific guidelines and marked the prospects for the visible future.

Fifth ISTC Scientific Advisory Committee (SAC) Seminar "Nanotechnologies in the areas of Physics, Chemistry, and Biotechnology"

Date: 27–29 May 2002
Place: St. Petersburg (Russia)
Budget: $40,000

The seminar was devoted to the review of the advances in various fields of nanotechnology and their applications in such areas as biology, medicine, production engineering, diagnostics, etc.

In his welcome speech, the Director of the Ioffe Institute, Noble Prize winner, Acad. Zhores Alferov stressed the significance and timely occurrence of the ISTC SAC seminar on one of the most intriguing and important areas of modern science, nanotechnology. He mentioned the importance of the international collaboration between scientists and the role of organizations like ISTC in establishing such cooperation. Presentation by Dr. Kroening, ISTC Executive Director, covering ISTC activities and partnership prospects, raised profound interest of the participants.
The three–day technical program of the seminar covered about 40 oral and about 100 poster presentations. Over 170 participants, including about 30 foreign specialists, represented 18 countries. During the special session, participants familiarized themselves with the nanotechnology programs in the research centers and ways of commercialization of the research results in Japan, USA, and countries of the European Union.

International Conference "Genetic Consequences of Emergency Radiation Situations"

Date: 10–13 June 2002
Place: Moscow (Russia), Vavilov Institute of General Genetics of Russian Academy of Sciences
Budget: $20,000

The Conference was dedicated to the 95th birthday of a great geneticist, Academician Nikolai Dubinin (1907–1998), the founder of the Institute of General Genetics of RAS, who gave origin to numerous trends in the field of general and radiation genetics. The Conference agenda covered a wide range of contemporary problems of radiation genetics: radiation mutagenesis; genetic consequences of emergency radiation situations for humans, flora and fauna; results and prospects of biological and medical studies supported by the ISTC. About 55 oral and 50 poster presentations were discussed at the section sessions. Presentations were made by scientists from the institutes of the Ministry for Emergency Situations of the Russian Federation, Academy of Sciences, Academy of Medical Sciences, Academy of Agricultural Sciences of Russia and CIS countries. Significant attention was paid to the scientific cooperation and joint works of the representatives of scientific centers in Obninsk, Pushchino and Dubna, and their colleagues from Mayak chemical plant (Chelyabinsk Region) and Russian Federal Nuclear Center (Sarov). Special attention was given to the genetic consequences of the Kyshtym and Chernobyl accidents, nuclear explosions at the Semipalatinsk testing site, and other emergency radiation situations.

During the opening ceremony, the Conference participants were welcomed by the Director of the Institute of General Genetics of RAS, Academician Yu. Altukhov, and by the ISTC Deputy Executive Director, Mr. Lawrence Wright. About 200 participants to the Conference represented various regions of Russia, CIS countries (Kazakhstan, Belarus, Armenia and Tajikistan), Germany, France, Ireland, Norway, and Bulgaria. The Conference participants displayed great interest in the reports on ISTC projects in the fields of biology and medicine, and highly appreciated their importance and practical value. Main results of the conference were included in the report to be presented by the Russian delegation in Vienna in February 2003 at the UN Scientific Committee session on the effects of atomic radiation.

International Conference "Cytokine – Inflammation, Immunity"

Date: 23–26 June 2002
Place: St. Petersburg (Russia)
Budget: $20,000

The main scientific topics of the conference covered the following areas of the Cytokine research: regulation of inflammation and immunity; medical microbiology and biotechnology; immunoregulatory and antimicrobial peptides; cytokines in oncology; cytokines in radiobiology and toxicology; cytokine immunotherapy; cytokines in autoimmune and allergic diseases; cytokines in the pathogenesis and treatment of infectious diseases, etc.

More than 400 participants from Russia, Belarus, Ukraine, Kazakhstan, Latvia, Lithuania, Estonia, USA, Japan, France, Israel, Switzerland, Great Britain, and Canada attended the conference. The conference audience included scientists, medical doctors, clinical immunologists, PhD students, representatives of biomedical companies.

The scientific program included 5 plenary reports, 3 reports for clinicians, 140 oral presentations, and 159 poster presentations. Main scientific topics included: cytokines and their clinical application; biotechnologies; molecular mechanisms of inflammation and immunity; infection and immunity; medical microbiology; immunotherapy and immunodiagnostics. Abstracts of the reports were published in the scientific journal "Cytokines and Inflammation". A number of young scientists, whose abstracts had been selected by the Program Committee, were awarded free registration and received travel grants to attend the conference.

The Organizing Committee and participants of the Conference decided to hold the next Cytokine conference in June 2004, in St. Petersburg.

International Conference "Ecological Problems of the Utilization of Nuclear Submarines and Energy Development of the Far–Eastern Region of Russia" (ECOFLOT–2002)

Date: 16–20 September 2002
Place: Vladivostok (Russia)
Budget: $ 30,000

The conference was organized by the Minatom of Russia, the ISTC, and the International Center for Environmental Safety of Minatom with active participation of the Primorsky Territory Administration, Ministry of Defense, Ministry of Economy and Development, Ministry for Natural Resources and other Russian governmental agencies and companies. The conference dealt with quite a number of issues, including current Russian and international approaches and technologies applied in integrated nuclear–powered submarine (NPS) decommissioning; monitoring and rehabilitation of polluted sites and territories; normative and legal aspects of environmental safety; re–training of the retired military personnel; medical and biological aspects of environmental and radiation safety in nuclear submarine decommissioning. New and prospective technologies for the utilization of spent nuclear fuel as well as of solid– and liquid radioactive waste were presented.

The participants visited company "Zvezda", the largest machine building and NPS–decommissioning enterprise in Russia's Far East.

The conference was attended by 200 Russian and about 60 foreign specialists, representatives of official and business structures, ecological and public organizations from USA, Canada, Europe, Japan, New Zealand.

LOCATION OF ISTC PROJECTS


FEDERATION
Bilibino
Yakutsk
Angarsk
Irkutsk
Krasnokamensk
Petropavlovsk-
Kamchatsky
MONGOLIA
Vladivostok
DEM. PEOPLE'S
REP. OF KOREA
REPUBLIC
OF KOREA
JAPAN
CHINA
MYANMAR
ISTC PROJECT
LOCATION
ISTC PROJECTS
LOCATED
IN MOSCOW REGION
Bolshie Vyazyemy
Chernogolovka
Dolgoprudny
Dubna
Dzerzhinskiy
Elektrogorsk
Elektrostal
Fryazino
Istra–2
Khimki
Klimovsk
Korolev
Lytkarino
Lyubertsy
Lyubuchany
Mendeleevo
Mytischi
Nemchinovka–1
Obolensk
Podolsk
Protvino
Puschino
Sergiev Posad
Serpukhov
Stupino
Troitsk
Zelenograd
Zhukovsky

Supporting Programs

Business Management Training Program

The Business Management Training Program is conducted to assist ISTC project managers in developing their general business knowledge, presentation skills, and understanding of intellectual property rights. The training complements the technical aspects of the ISTC project, toward helping the project manager in future commercialization of the project results and in securing funding from sources beyond the ISTC.

The program is conducted mainly through Regional Training Centers in locations convenient to ISTC project managers. Training typically spans several days and covers practical topics of interest for ISTC project managers and their team members: business planning, project and financial analysis for securing investment, marketing of innovative products, intellectual property protection, strategies for effective presentations to the business community, and others.

Activity in 2002

In 2002, more then 50 business management and technology commercialization training events were held for about 1000 ISTC project participants. Those included several interactive on–the–job long–term training courses on commercialization of technologies resulting from the ISTC funded projects. Such courses were conducted by the International Business Incubator (RTC, Moscow), “High Technology Group“ (RTC, Yerevan), “Ural Education and Research Center of Innovation Business“ Fund, (RTC, Ekaterinburg), International Scientific Technology Park “Technopark in Moskvorechye” (Moscow).

St. Petersburg Regional Training Center: training session on commercialization

11 ISTC project participants received a month–long training on technology commercialization at Management Academie Sachsen (Dresden, Germany).

Along with the Business Management Training Program, other training–related activities were conducted in 2002. Three training sessions were held for 220 project managers and accountants of newly funded ISTC projects to assist them in executing their work. 9 scientists from the Project #G–40 team received technology training at GRS GmbH (Cologne, Germany). Travel support was provided for 18 specialists from Vector, Novosibirsk for SABIT training in Washington DC, USA. A workshop on Corporate Culture for ISTC Secretariat staff was held.

ISTC Secretariat staff at the off–site Corporate Culture workshop.

Mega–Capable Microchips

«The ISTC project #2019, utilizing cutting–edge technology to create rapid diagnostic kits for multiple drug–resistant tuberculosis, has been very successful. I have been very impressed by the caliber of the Engelhardt leadership and staff. And the ISTC has played a major role in the development and implementation of the biochip project. Truly, this is exciting work that has some exceptional potential benefits for Russia and the world.»

Robert J. Tossatto – Acting Director,
US Department for Health and Human Services / Office for Europe and N. Eurasia

A scientist at Engelhardt Institute testing biochip production equipment

The biochip test kit

Once thought to be defeated, tuberculosis nevertheless presents a major threat in the 21st century. Every year over 30 million people in the world get infected with TB, and the death toll amounts to 2 million annually. The problem is aggravated by the fact that today humanity has to deal with over one hundred mutant TB strains many of which effectively resist traditional drugs. Conventional drug susceptibility tests require 2–5 weeks to specify the strain and select a proper course of treatment while the patient continues to suffer and infect other people.

Development of an efficient and low–cost biochip technology by scientists at the Engelhardt Institute for Molecular Biology became a major breakthrough in this battle against the deadly disease. In their biochip method, application of the nucleic acid of the strain being tested to a microarray of diagnostic oligonucleotides on a glass slide (the biochip) and subsequent measurement of the degree of hybridization allow to specify the strain within one or two days. This method has also proven efficient in prompt and accurate identification of orthopox viruses, including smallpox, thus giving physicians a powerful diagnostic tool should any natural or terrorist–inflicted outbreak of smallpox occur. Apart from being cost effective, the biochip technology could make clinical diagnostic tests simple enough to be widely used even in field test situations without needing highly qualified staff.

The ISTC and the US Department of Health and Human Services support two projects in Russia pioneering the use of the biochip technology. With their help, scientists at the Engelhardt Institute and VECTOR National Research Center in collaboration with US counterparts from the Centers for Disease Control and Prevention and the Food and Drug Administration are now working to further develop and validate microchip methods for rapid and reliable procedures for identification of TB strains, smallpox and herpes viruses. The demand for these diagnostic instruments is huge. «Russia alone needs 2 million TB strain biochips annually, to say nothing about other applications of this technology,» says Dr. V. Barsky of the Engelhardt Institute Biological Microchip Center.

Supporting Programs

Travel Support Program

The ISTC strongly encourages CIS scientific teams to develop their project proposals with the participation of foreign collaborating organizations. The Travel Support program fosters collaboration by reimbursing travel and related expenses for CIS scientists who wish to begin or continue technical consultations on the proposals they submit to the ISTC. Program funds also cover travel expenses for scientist participation in international meetings and conferences relevant to their specialization. Funding for the program is provided by voluntary contributions supporting specific technical areas and CIS institutes.

Activity in 2002

Scientists and technical team members were funded on **305** individual trips to collaborating organizations, seminars, and conferences located worldwide.

In a parallel activity, **40** scientists received funding for visits to European Partnering events through the European Union Mobility Support Fund.

Promising Research Abstracts Database
(by technology)

Technology	No. of Abstracts
Biotechnologies	291
Chemisrty	170
Ecology	165
Nuclear Energy	87
Fission Reactors	15
Information and Communication Systems	163
Instrumentation	59
Manufacturing Technologies	63
Materials	222
Non–Nuclear Energy	61
Other	25
Other Fundamental Sciences	50
Physics	234
Space, Aircraft and Surface Transportation	150
Total	**1755**

Technologies Database Program

Through its contacts with hundreds of research institutes and centers throughout the CIS, the ISTC has uncovered many innovative technical projects either planned or now underway which conform to the nonproliferation objectives of the ISTC. The ISTC established the Technologies Database Program (formerly Promising Research Abstracts) to establish and expand information exchange infrastructure concerning research activities, toward promoting the expertise of CIS research institutes and cooperation between CIS and foreign technical experts.

Activity in 2002

The CIS Science and Technologies Internet Portal at www.tech–db.ru contains information on activities of approximately 400 CIS research institutions collaborating with the ISTC.

Next, 5th version of the Promising Research Abstract CD was prepared, containing more than 1700 new and unique research opportunities as well as about 500 technology abstracts submitted by leading researchers from Russia and CIS. That information will be open for the public and available through the Internet and in a CD version. The ISTC continues to collect abstracts of existing technologies for investment and of innovative projects at earlier stages of development.

The ISTC plans to continue supporting creation of national science and technology databases in CIS countries.

ISTC: Growing Small Enterprises

The rich science and technology potential that Russia possesses is not being duly used.. There are very few worthwhile and long–term projects in our economy meeting this potential. … We need to create conditions for the healthy commercialization of applied science.»

President Putin's address to the RF Federal Assembly
18 April 2002

NTM–Zashchita displays its product line

The growth of small high–technology enterprises in Russia is one promising sign of sustainable development and job creation. Dr. Sergei Kryvasheev, Executive Director of NTM–Zashchita (Protection) company, is a former ISTC Project Manager (#0484 Block–Modulus Monitoring System) who describes his successful small enterprise and ISTC's contribution to its growth.

At the technopark at the Moscow Engineering and Physic Institute, NTM–Zashchita designs and produces equipment for ecological controls that are required by Russian federal sanitation regulations.

NTM began as a small enterprise in 1995, but the ISTC project dates from 1997, allowing NTM to use ISTC funds in developing new products for market niches known to the product team. Dr. Kryvasheev explains: «In a short period, with ISTC support, we were able to make 6 different types of ecological monitoring equipment – each of which found success in local markets. Foreign competitors have been pushed out, unable to match NTM–Protection on price and service.

The ISTC helped us to reduce the risk involved in technology development, and the ISTC framework allowed us to include the talents of weapons scientists in our research; these scientists would otherwise have remained unavailable for NTM projects.»

Now having 30 full–time employees, NTM sells equipment to 5 main distributors in Russia, Kazakstan, and Belarus, servicing such organizations as the international airport Sheremetyevo, GazProm, and Ministry of Atomic Energy enterprises. Since 1995, NTM has seen sales growth averaging 20% per year, including in 2001 a contract with the United States government for continual monitoring of nuclear weapons storage areas inside the Russian Federation. The contract is part of the joint US – Russian effort in cooperative threat reduction.

Supporting Programs

Communication Support Program

Communications Support aims to improve the telecommunication infrastructure of institutes where current capabilities inhibit the successful accomplishment of ISTC work and the development of commercial opportunities.

Activity in 2002

The ISTC has introduced organization–al improvements to the Communication Support Program that contributed to better understanding between institutes and Funding Parties.

The Center has funded 20 CSP projects in Russia, Kazakstan, Kyrgyzstan, and Armenia. Of these **4** have been complet–ed, **6** are under completion, and **10** are in progress.

4 internet connection contracts external to projects have been funded within the framework of the CSP. CSP is now con–sidering **7** additional projects and is mak–ing further management improvements that will allow more rapid installation of temporary connections and provision of consulting–training services.

Valorization Support Program

Valorization Support is directed to projects whose results have commercial and scien–tific potential that can produce long–term economic support for weapons scientists and engineers and support their redirection to peaceful endeavors.

Activity in 2002

The ISTC concluded a Framework Agreement with the Technology Commercialization Group LLC (USA) on valorization and marketing support ser–vices. The goal of this activity is to evalu–ate the technical and commercial potential of technologies resulting from ISTC pro–jects and establish relationships between project teams and sponsors/partners.

Technology assessment, market research and competitive analysis were provided by consultant companies on 12 ISTC projects identified as having consid–erable commercial potential, to assist the ISTC in promoting these technologies in the world markets.

The Center concluded a contract on Systematization and In–depth Analysis of ISTC Sustainability Data with the Center for Science and Education Programs (Moscow) to identify principal indicators with respect to sustainability and to ana–lyze data available from the ISTC database vis–a–vis overall national S&T trends.

The ISTC published 7 brief technology descriptions in the «Search for Partners» edition of the BISNIS (Business Information Sevice for the NIS) directory. BISNIS, headquartered in Washington, D.C., is the U.S. Government's market information center for U.S. companies pursuing business development in the CIS.

Licenses and subscriptions to on–line technology transfer databases and market research were added to the ISTC invento–ry of valorization resources.

Patenting Support Program

The Patent Support Program recognizes the contribution of ISTC projects and their par–ticipants to new inventions and ideas that have commercial value. The ISTC Secretariat administers this program to pro–vide financial support to CIS institutes. Program funds are used to pay costs asso–ciated with the initial stages of patenting.

Activity in 2002

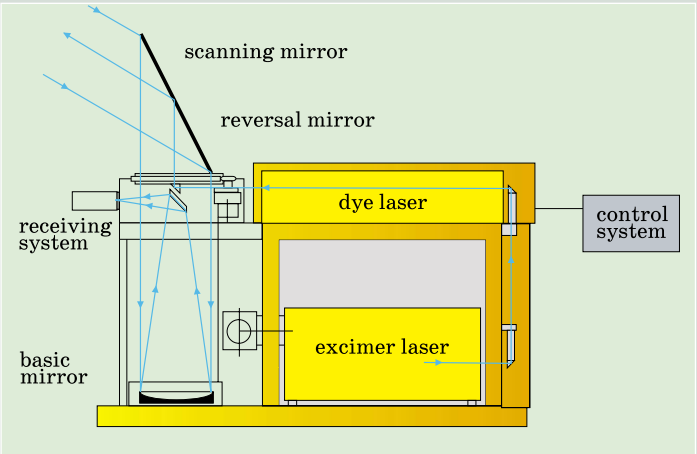
The Patent Review committee received **25** applications and provided financial support to **13** patent applications arising from ISTC project results.

The Kurchatov Center LIDAR being adapted for the General Atomics E–SMART system

ISTC–Funded Russian Technologies Contribute to Safer Environment

In 1996, Irina Moskalenko of the Kurchatov Research Center's Institute of Nuclear Fusion received an ISTC grant to develop a portable LIDAR (Laser Induced Differential Absorption Radar) system for monitoring environmental pollutants. Unlike the radar systems used by law enforcement agencies, a LIDAR can be focused over a variety of ranges and specifically detect and identify molecules through their spectral absorption «signature». Three years later Dr. Moskalenko successfully tested her proto–type LIDAR system, measuring the quantity and composition of contaminants in pollution plumes from industrial sites and dumps in the Moscow region. The revolutionary flexi–bility, ruggedness and functionality of the system proved to be a breakthrough in the LIDAR technology attracting attention of quite a few potential partners.

In 2000, General Atomics (GA) of the USA approached the ISTC to source Russian environmental monitoring sensors that could expand the capabilities of GA's E–SMART™ (Environmental Systems Management Analysis and Reporting neTwork (E–SMART™) system. Specifically, GA sought Russian expertise to develop a Chemical and Biological Detection Network as a product line expansion of E–SMART™. ISTC solicited pre–pro–posals for near market ready technologies for real–time detection of chemical and biological agents in the air and water. The Kurchatov pre–pro–posal was chosen along with three others out of twenty received by the ISTC.



While Dr. Moskalenko's LIDAR system is being adapted to detect agents in the air, Dr. Victor Bunin's project involves sensing agents in liquid media. His approach of detecting cells based upon their electro–physical characteristics was also developed under a previous ISTC–funded project. Dr. Bunin heads the laboratory for physical methods for cell research at the State Scientific Research Institute of Applied Microbiology in Obolensk (SRCAM), which conducts fundamental and applied research in molecular biology, immunology and ento–mology to resolve various problems of mod–ern medicine and biotechnology.

Bringing these teams together means that the Russian institutes will be contributing their proprietary technologies developed through ISTC support instead of simply using their knowledge base for the exclusive ben–efit of others. A partner like General Atomics is ideal because they are interested in tech–nologies that may not meet their specific need off–the–shelf, but can be readily adapted to their purpose.

Dr. Roger Schlicht, GA's E–SMART™ pro–gram manager, considers that, «the ISTC's principle value is linking the needs of busi–nesses and Russian science, much of which we simply are not aware of …»

Today, the ISTC–catalyzed relationships between General Atomics and a half dozen Russian research institutes are addressing international problems that have taken on a more urgent nature.

Supporting Programs

Russian participants
of the BIOINSTRUMENTS
Partnering Event in Germany

Activity in 2002

Event	Date	Location
International Research Ethics; Institutional	21–24 January	Pushchino, Russia
Review Boards and Laboratory Animal Welfare IT Enterprise Tour	25 February – 01 March	Denmark
Problems and Perspectives of Biotechnology Transfer	20–22 March	Obolensk, Russia
Computer Classes for Russian Experts in Field Epidemiology	15–19 April	Moscow, Russia
Advanced Biotechnologies in Russia/CIS	16 April	Tokyo, Japan
2nd International Conference: «Biotechnology and Business»	16–17 May	Moscow, Russia
Roadshow in Germany	30 May – 11 June	Germany
3d Annual DTRA Colloborative Biodefense	03–05 June	Serpukhov, Russia
Research Program Review Space Weather Forecast in Russia/CIS	05–06 June	Nagoya, Japan
New Materials	10–11 June	France
New Developments in Photodetection	17–21 June	Beaune, France
Special Symposium «Biosafety and Prevention of Bioterrorism»	28–29 June	St. Petersburg, Russia
Applied Biostatistics and Epidemiology	08–19 July	Moscow, Russia
Project Management Training	26–29 August	Moscow, Russia
German–Russian Partnering Event «Bioinstruments»	26–28 September	Jena, Germany
International Symposium: «Decision Making Process for Reducing Effects of Chemical Terrorist Attacks»	08–09 October	Volgograd, Russia
1st International Congress «Biotechnology – State of the Art & Prospects of Development»; 1st International Specialized Exhibition «Biotech World 2002»	14–18 October	Moscow, Russia
45th Annual Conference of American Biological Safety Association	20–23 October	San Francisco, USA
Advanced nanotechnologies in Russia/CIS	06 November	Tokyo, Japan
Advanced nanotechnologies in Russia/CIS	08 November	Kyoto, Japan
Biological Proliferation Prevention Project conference	11–13 November	Garmisch–Partenkirchen, Germany
New Production Technologies and Materials	2–5 December	Lisbon, Portugal
Project Management Training	09–12 December	Moscow, Russia

US delegation visiting the ISTC booth at the
«Biotech World 2002» exhibition

Workshop Program

The ISTC regularly organizes workshops to highlight technologies and topics of global significance, and to facilitate the development of project proposals and the inclusion of Partners and collaborators in ISTC activities.
Workshop funding covers travel expenses of CIS scientists who participate in these workshops, and related organizational expenses.

ISTC Biosafety Symposium in St. Petersburg

Academician Miroshnikov declares the Symposium open

On June 28–29, 2002 a Special Symposium on «Biosafety and Prevention of Bioterrorism» was held at the premises of Military Medicine Academy Club in St.– Petersburg. The event was organized by the ISTC in close cooperation with Russian Academy of Sciences, Ministry of Industry, Science and Technologies of the Russian Federation, Shemyakin & Ovchinnikov Institute of Bioorganic Chemistry, and Russian Biochemistry Society. Over 60 participants from leading institutes of the Russian Academy of Sciences attended the event, representing Institute of Molecular Biology; Institute of Molecular Genetics; Novosibirsk Institute of Biorganic Chemistry; Moscow State University as well as other institutes and research centers which had earlier been engaged in bioweapon defense development: State Research Center «Vector», Novosibirsk; State Research Center of Applied Microbiology, Obolensk; Research Center of Molecular Diagnostics and Therapy, Moscow; State Research Center for Highly Pure Biopreparations, St. Petersburg; and Military Medicine Academy. Representing the United States of America were officials from the Department of State, Cooperative Threat Reduction program (CTR), Initiative for Proliferation Prevention (IPP) as well as the US Embassy Science Division.

The peptide synthesis laboratory at the State Research Center for Highly Pure Biopreparations

Welcoming addresses were made by:

- Academician A. Miroshnikov, Deputy Director of Schemyakin & Ovchinnikov Institute of Bioorganic Chemistry,
- Ann Harrington, Deputy Director, Office of Proliferation Threat Reduction, Department of State
- Randall Beatty, ISTC Advisor, and
- James Noble, Director, Initiative for Proliferation Prevention.

Having expressed his gratitude to the organizers of the symposium and the ISTC for support and hosting of the event, Academician A. Miroshnikov noted the increased urgency of biosafety and bioterrorism problems, which have neither geographic nor national boundaries. In their addresses, American participants expressed readiness to support Russian scientists in their research directed to reduction and prevention of bioterrorism threats. It was also pointed out, that terrorism as a whole, and bioterrorism in particular have turned to be the most hazardous threat for national security of both Russia and the US.

The main issues discussed at this conference included:

- prevention of bioterrorism in theory and in practice,
- detection of biological pathogens,
- treatment of infectious diseases, and
- chemical weapons and neurotoxins.

The Symposium participants delivered about 20 reports on the most burning issues of biosafety and conducted a number of presentations dealing with the latest developments in the fields of express identification of pathogens and counteraction against bioterrorism. Guests of the conference were also offered a tour of the St. Petersburg Research Center for Highly Pure Biopreparations.

The ISTC – MinAtom Fuel Cell Initiative

Participants of the ISTC–MinAtom Fuel Cell Worshop

A discussion over fuel cell prospects in gas industry

The ISTC delegation meeting with Russia's 1st Deputy Minister of Atomic Energy L. Ryabev

As part of an overall effort to introduce a programmatic approach to the Secretariat operations, whereby topic–based programs, rather than individual projects, are funded, the ISTC plans to launch the Fuel Cell Program.

Fuel cells were selected as the topic for the ISTC program under this new system for several reasons. First, the technology is very promising in terms of energy efficiency and environmental cleanliness. Secondly, the Russian and CIS institutions formerly engaged in weapon research have excellent knowledge and expertise in this scientific area.

The development of the Fuel Cell Program stemmed from a joint ISTC–Russian Ministry of Atomic Energy (MinAtom) Fuel Cell Workshop, which took place on August 8, 2002. Over 20 fuel cell experts, MinAtom executives, and representatives from Gazprom, Russia's natural gas giant, attended. At this meeting, the participants outlined the basic requirements for the creation and execution of a joint Fuel Cell Program aimed at establishing a commercially viable technology in Russia.

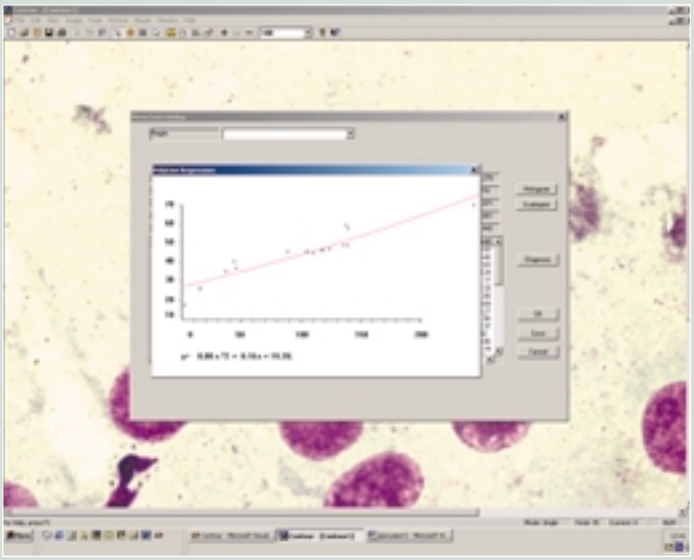
Briefly, the first phase of the Fuel Cell Program will prepare the Russian and CIS internal market for the introduction of commercial, fuel cell–based power plants. Issues surrounding licensing and personal training as well as legal considerations will need to be addressed. A pilot installation design, product manufacturing and field–testing will also be completed. The final phase of the program will aim to establish a business that would employ the majority of program participants and create new jobs.

The Fuel Cell program will bring together scientists, engineers, and the business sector to focus financial and management resources and manpower on the creation of a sustainable, hi–tech business to meet the requirements of the Russian and world markets. Parallel commercialization of all intermediate technologies and products developed in the course of the Program is anticipated.

All the benefits described so far continue to be in line with the main objectives of the ISTC mission. That is, former weapons scientists will be given more opportunities to redirect their knowledge and efforts to peace–promoting, sustainable research. And since analysis of the Russian market and production capabilities shows that it is not possible to cover the market demand for fuel cell technology in the next 10–15 years without international cooperation, the Program will foster the integration of CIS scientists and engineers into the global scientific community.

During a meeting with ISTC representatives on September 5, 2002, the First Deputy Minister from MinAtom, Mr. Ryabev, voiced unconditional support for the programmatic approach, in particular for the proposed Fuel Cell Program. In addition, Minatom and Gazprom, a potential customer of fuel cell technology, have already agreed to participate in and co–fund the Fuel Cell Program. Several private companies have also expressed their interest, and are presently discussing the conditions of their involvement.

International Researchers United in Assisting Radiation Victims



Project B–323 scatter diagram compared with the data from the expert system, allows for differentiating between malignant and benign thyroid diseases.

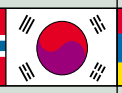
The Chernobyl nuclear power plant accident contaminated approximately 1/4 of the territory of Belarus with radionuclides, exposing nearly 2.2 million people to radiation. As a result, populations in the region surrounding Chernobyl continue to be impacted by the catastrophe nearly 15 years after the accident. The ISTC is uniting the Belarus Ministry of Health, and specialists in health, environment, and information technologies with funding from sources within the United States and the European Union. ISTC projects totaling nearly $1.1 million are now addressing serious health issues related to radioactive contamination in Belarus:

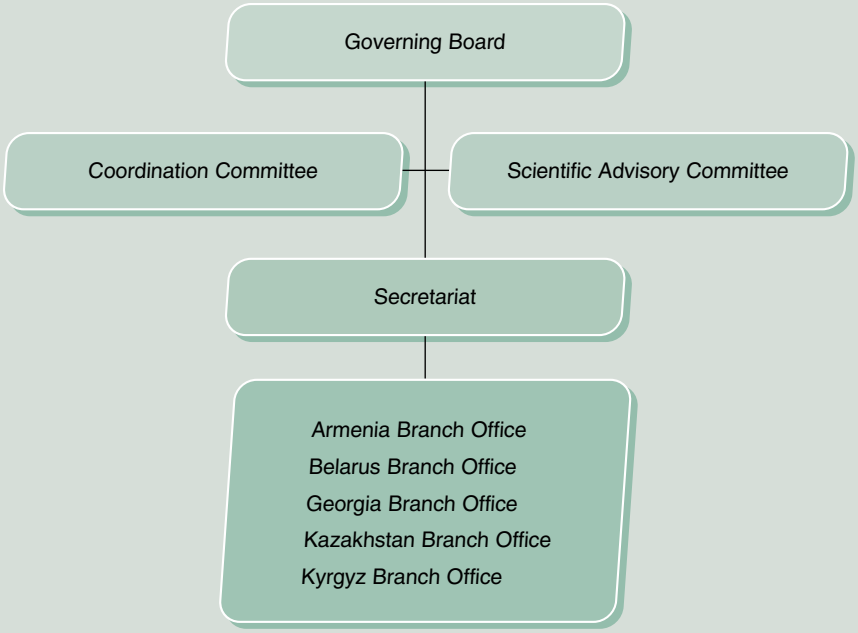
To quantify the long–term risks of thyroid cancer due to radioiodine released in nuclear accidents – to which children are especially susceptible – the US National Cancer Institute is providing funding for Project #B–550, headed by the Research Institute of Radiation Medicine and Endocrinology. The results will be used to develop scientific procedure for long–term radiation–epidemiological studies, providing reliable information on radiation effects in a wide dose range regarding thyroid cancer and other disorders. The scope of the project is vast, including screening visits of nearly 12,000 children who were directly effected by Chernobyl radiation in April 1986, with follow up medical observation for those showing signs of thyroid pathology, and referrals to Belarus medical centers for treatment. In addition to funding, the National Cancer Institute provides expert assistance and consultation to their Belarus colleagues, joint publications, and training for Belarus specialists in the United States.

B–323 Image Processing for Cytology
B–488 Early Radiation Data for Chernobyl Accident
B–517 Remote Cancer Diagnostics
B–522 Computer System for Leukemia Therapy
B–550 Thyroid Pathologies in Chernobyl Area

With the sharp increase in incidences of thyroid cancer, the medical community in Belarus now must adapt new methods for fast, accurate diagnosis. Scientists on Project #B–323, funded by the European Union, are creating computer analyzers and software for image processing of thyroid samples. The Institute of Engineering Cybernetics in Minsk is supporting the project. The image processing system is demonstrating the power of information technologies as expert system guide to physicians who now diagnose cancers and decide a course of treatment. The complete system (a unit for morphometric studies, patents for the modes of diagnosis, electronic atlas of thyroid pathology, and software) is expected to find a large demand on world markets, for its accuracy and efficiency in verifying cancer diagnoses before surgery.

Parties to the ISTC Agreement

Founding Parties				Other Parties		CIS Parties				
										
European Union	Japan	Russian Federation	United States of America	Norway	Republic of Korea	Armenia	Belarus	Georgia	Kazakhstan	Kyrgyz Republic



The Governing Board includes representatives of the European Union, Japan, Russian Federation, and United States, plus one rotating seat for a member CIS country, held by Belarus in 2002.

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

The Scientific Advisory Committee provides expert scientific evaluation of project pro–posals, determines new directions for project and program activities, and evaluates ongoing projects.

Members of The Governing Board:

Chair (USA) . . . . . .Ronald F. Lehman II

European Union . . . . . .Achilleas Mitsos

Japan . . . . . Tadashi Fujitu

. . . . . Kenichi Suganuma

Russian Federation . . . . . .Lev Ryabev

. . . . . .Vladimir Pavlinov

United States of America . . . . . .Victor Alessi

Belarus . . . . . .Pyotr Vityaz

Members of The Scientific Advisory Committee:

Chair (Japan) . . . . . Ya Seki

. . . . . .Yutaka Murakami

European Union . . . . . .Jean–Pierre Contzen

. . . . . .Alain Pompidou

Russian Federation . . . . . .Evgeny Avrorin

. . . . . Yuri Trutnev

United States of America . . . . .Steven Gitomer

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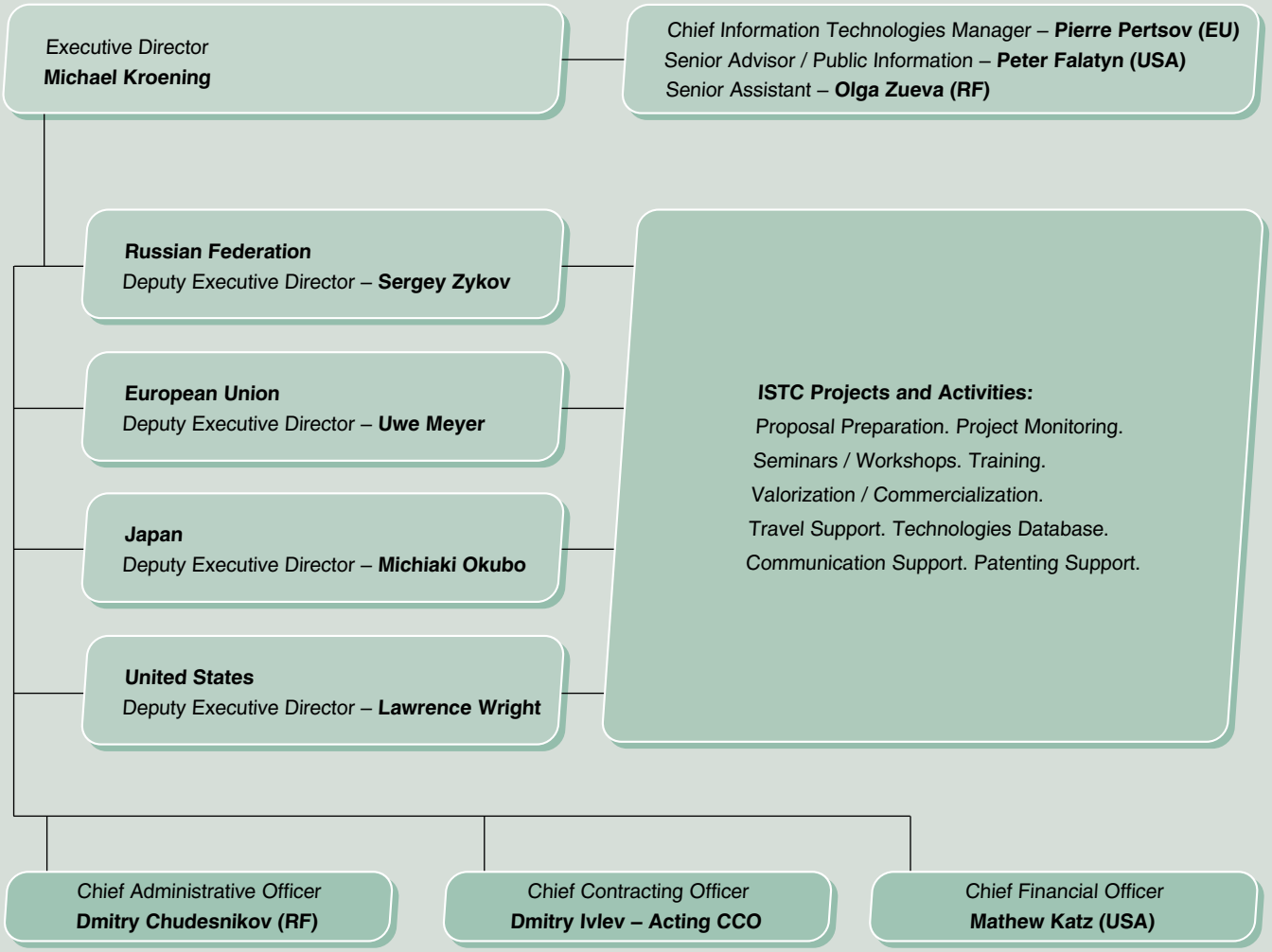
ISTC Secretariat

Headquartered in Moscow with Branch Offices in 5 CIS countries, the Secretariat is the executive body of the ISTC. It implements the decisions of the Governing Board and manages the daily operations of the Center. Its international staff of over 150 scientific and administrative personnel oversees and monitors more than 700 active projects, provides training and business support to CIS project managers, and implements the many Center programs that support nonproliferation.



Summary of ISTC Project Funding

Technology Area / Technology Field	2002				1994–2002	
	Funded		Completed		Funded	
	# Proj.	$ Value	# Proj.	$ Value	# Proj.	$ Value
Biotechnology and Life Sciences Biochemistry, Cytology, Genetics and Molecular Biology, Ecology, Immunology, Microbiology, Nutrition, Pathology, Pharmacology, Physiology, Public Health, Radiobiology	56	25,015,406	13	3,449,200	348	114,172,095
Chemistry Analytical Chemistry, Basic and Synthetic Chemistry, Industrial Chemistry and Chemical Process Engineering, Photo and Radiation Chemistry, Physical and Theoretical Chemistry, Polymer Chemistry	21	5,344,726	7	1,214,500	86	21,022,813
Environment Air Pollution and Control, Environmental Health and Safety, Modeling and Risk Assessment, Monitoring and Instrumentation, Radioactive Waste Treatment, Remediation and Decontamination, Seismic Monitoring, Solid Waste Pollution and Control, Waste Disposal, Water Pollution and Control	40	9,906,820	26	6,104,025	268	77,897,975
Fission Reactors Decommissioning, Experiments, Fuel Cycle, Isotopes, Materials, Modeling, Nuclear and Other Technical Data, Nuclear Instrumentation, Nuclear Safety and Safeguarding, Reactor Concept, Reactor Engineering and NPP, Reactor Fuels and Fuel Engineering	19	6,143,615	22	6,104,025	173	54,915,484
Fusion Hybrid Systems and Fuel Cycle, Inertial Confinement Systems, Magnetic Confinement Systems, Plasma Physics	2	340,000	5	946,650	39	11,420,013
Information and Communications Data Storage and Peripherals, High–Definition Imaging and Displays, High Performance Computing and Networking, Microelectronics and Optoelectronics, Sensors and Signal Processing, Software	8	2,171,211	4	299,610	75	18,794,799
Instrumentation Detection Devices, Measuring Instruments	11	3,329,771	9	1,899,000	97	26,352,417
Manufacturing Technology CAD and CAM, Engineering Materials, Machinery and Tools, Manufacturing, Planning, Processing and Control, Plant Design and Maintenance, Robotics, Tribology	14	10,439,705	8	1,144,794	52	17,303,955
Materials Ceramics, Composites, Electronic and Photonic Materials, Explosives, High Performance Metals and Alloys, Materials Synthesis and Processing	25	7,394,789	22	4,730,345	148	47,978,496
Non–Nuclear Energy Batteries and Components, Electric Power Production, Fuel Conversion, Fuels, Geothermal Energy, Heating and Cooling Systems, Miscellaneous Energy Conversion, Solar Energy	10	4,129,018	3	327,386	40	13,787,454
Other	6	1,688,350	–	–	18	3,593,216
Other Basic Sciences Agriculture, Building Industry Technology, Electrotechnology, Geology, Natural Resources and Earth Sciences	2	451,621	2	173,670	21	4,372,637
Physics Atomic and Nuclear Physics, Fluid Mechanics and Gas Dynamics, Optics and Lasers, Particles, Fields and Accelerator Physics, Plasma Physics, Radio–frequency Waves, Solid State Physics, Structural Mechanics	32	7,784,614	26	3,434,319	260	58,696,935
Space, Aircraft and Surface Transportation Aeronautics, Astronomy, Extraterrestrial Exploration, Manned Spacecraft, Space Launch Vehicles and Support Equipment, Space Safety, Spacecraft Trajectories and Flight Mechanics, Surface Transportation, Unmanned Spacecraft	3	451,670	10	2,524,529	75	20,435,397
Totals:	**249**	**84,591,316**	**157**	**32,834,650**	**1,700**	**490,743,687**