CRDF

U.S. Civilian Research and Development Foundation

for the Independent States of the Former Soviet Union

2001 Program Report

Conducting innovative activities of mutual benefit that help sustain the civilian scientific and technical capability of the countries of the former Soviet Union in the interests of international peace and security

U.S. Civilian Research and Development Foundation
for the Independent States of the Former Soviet Union (CRDF)

2001 Program Report
Table of Contents

Promoting Peace and Security through Science and Technology

Joint Message from the Chair and the President

At the seven-year point in the CRDF's history, it is reasonable to step back and ask the hard question: What have we accomplished? In the past year we have given some attention to evaluating not only our effort but also the broader initiative to assist the sciences in the former Soviet countries. In October 2001 the CRDF cosponsored an international meeting with the Royal Society in London, entitled "International Support of Science in Russia and Ukraine: A 10-Year Retrospective and Forward Look." The conference was attended by distinguished representatives from those countries, as well as from nearly all the major international organizations that have been working in this field for the past decade. The participants agreed that direct financial support has unquestionably helped in the short term to keep many people in science who might otherwise have left it or their countries altogether. They also concluded that these programs have had a broader impact, building acceptance of new approaches to managing and funding science and the skills to implement these approaches. Competitive grant making, once unknown in the region, has in the past ten years, to varying degrees, been recognized and embraced by scientists and governments there.

This finding correlates with the increasingly high quality of the scientific grant proposals we have received at the CRDF over the past seven years. With every competition held by the CRDF or one of its international partners, scientists in the former Soviet Union have become more skilled in writing proposals and more capable of competing for funds for civilian research, both internationally and domestically. We count this understanding of competitive science funding and the skills needed to obtain it as one of our most important accomplishments for the long-term survivability of the sciences in the former Soviet Union.

In this case, as with all our programs, our focus has not been merely on how much money we provide, but on how we provide it, what change is created by the availability of the funds, and what is left behind after the grant itself has ended.

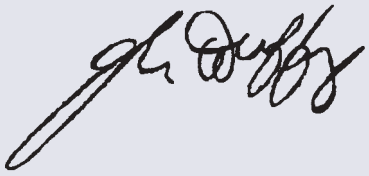
Preventing the proliferation of weapons and technologies of mass destruction is a key goal of our programs. The CRDF's unique contribution in this area is to provide a merit-based science-driven framework for former Soviet weapons scientists to work in long-term collaborations with American scientists on civilian research projects. As described in the following pages, over 50 percent of our research grants in 2001 included former weapons scientists. We consistently seek to enlarge this proportion through outreach efforts and assistance to other U.S. Government-supported programs, such as the International Science and Technology Centers and the Cooperative Biodefense Research program. Beyond simply providing money, we believe that such international engagement can help to build the commitment of weapons scientists to the norms and practices of the international scientific community and to mitigate the harmful effects of the isolation in which they formerly worked.

Creating innovative models for research and development has been central to our other activities too. Our Next Steps to the Market program has achieved strong recognition from the Russian Government as an exemplary

and uniquely effective approach to promoting technological innovation and promoting partnership with U.S. industry. In partnership with the John D. and Catherine T. MacArthur Foundation and Carnegie Corporation of New York, our Basic Research and Higher Education program has pioneered a center-based concept of university capacity building in Russia that has become an integral part of the Russian Government's own programs to strengthen scientific research and training in universities. And a source of special pleasure for us has been our work to nurture competitive grant-making institutions in the region by providing seed funding and training for nongovernmental science foundations in Armenia, Moldova, Georgia, and Azerbaijan.

The tragic events of the past year have illustrated, more eloquently than any words we could write, the central priority of efforts to promote international understanding and to reduce the dangers of war and terrorism. The CRDF has taken advantage of its unique capabilities to play a modest practical role in the nation's response to the events of September 11, 2001. Our Special Competition for Research on Minimizing the Effects of Terrorist Acts on Civilian Populations, announced at the end of December 2001, is creating opportunities for scientists and engineers from the United States and the countries of the former Soviet Union to pool their expertise in finding solutions to threats from potential terrorist acts. We are proud that the CRDF could offer such a timely and appropriate initiative.

To us, the shocking terrorist acts highlight the abiding importance of the CRDF's mission and purpose. One of our core beliefs is that international cooperation in science and technology must be a significant part of any serious effort to build a more stable, more prosperous, and less dangerous world. We hope the reader will find many illustrations in these pages of how the CRDF's programs are helping to achieve these goals. More broadly, we also hope that this report will encourage those who share our belief in the exciting potential of international science and technology cooperation to solve human problems.



Gloria Duffy
Chair, Board of Directors

Gerson S. Sher
President and Executive Director

CRDF BOARD OF DIRECTORS

The CRDF Board of Directors is the organization's policy-making body. Its members bring to the CRDF a wealth of knowledge and experience in areas that bear on the foundation's purposes.

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Rice University

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Smith College

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Councils of the United Kingdom

NOTE TO OUR SUPPORTERS

The CRDF would like to thank the following U.S. Government agencies, private organizations, and donors for their financial support in 2001:

U.S. Department of State
National Science Foundation
National Institutes of Health
U.S. Department of Defense
The John D. and Catherine T. MacArthur Foundation
Carnegie Corporation of New York
The W. Alton Jones Foundation
Anonymous

The CRDF's continued success also depends on the many scientists and engineers in the United States and in the former Soviet Union who volunteer their time and expertise to ensure the scientific merit of our programs. We thank all those individuals who share our commitment to sustaining the civilian scientific capability of the countries of the former Soviet Union.

Strengthening and expanding our reach

The CRDF continued its solid track record of developing and implementing innovative programs to address the ongoing challenges that scientists and engineers face in the former Soviet Union.

In 2001 the CRDF took steps to strengthen the impact of its programs. In its Industry Programs, the CRDF added a new component to pave the way for more industry-oriented collaborations. The CRDF also introduced a web-based proposal submission system, widening access and improving the proposal review process for its flagship Cooperative Grants Program and its Grant Assistance Program. And the CRDF implemented evaluation activities to measure success and to ensure that its programs are having the desired impact.

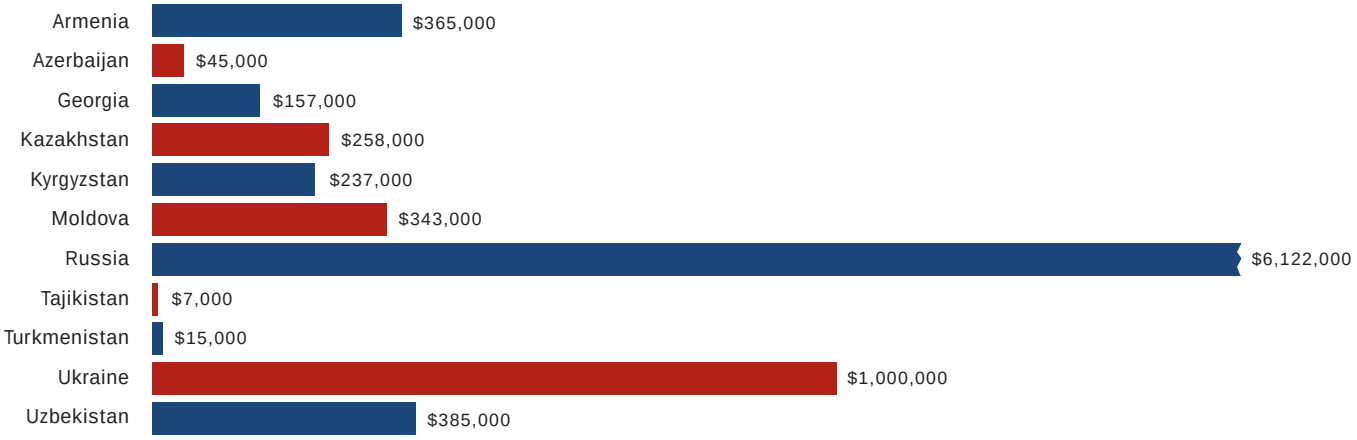
The foundation also expanded the reach of its activities, increasing participation in its programs from less-represented countries of the former Soviet Union (FSU) and from regions outside the capital cities.

Under its Cooperative Grants Program, the CRDF saw increases in proposal submission rates of more than 60 percent by scientists from Azerbaijan, Georgia, Kyrgyzstan, Moldova, and Uzbekistan. This impressive growth was due in part to the CRDF's targeted proposal development and training efforts in those countries. Also, the Regional Experimental Support Centers program, which provides major scientific equipment at selected institutes to spur technological and economic development, reached seven countries by the end of 2001. And in Armenia, Georgia, and Moldova, the CRDF supported the establishment of independent grant-making organizations and is helping to develop the scientific potential of the countries through those organizations. **Figures 1 and 2** show CRDF grant expenditures by country and by program area.

Remaining true to its original purposes, the CRDF continued to

- support exceptional merit-reviewed research projects that offer FSU scientists and engineers alternatives to emigration
- advance the transition of FSU weapons scientists to civilian work by funding collaborative non-weapons research and development projects
- help to move applied research to the marketplace and bring economic benefits both to the countries of the FSU and to the United States.

FIGURE 1: CRDF 2001 Grant Expenditures by Country*



* Amounts do not include CRDF administrative costs

These purposes cut across all of the CRDF's programs and activities and guide the foundation in its new endeavors.

Cooperative Grants

The year 2001 saw the CRDF's third broad merit-based grant competition for collaborations between FSU and U.S. scientists. The Cooperative Grants Program, first launched in 1995 as the CRDF's inaugural activity, offers an avenue into new research directions and collaborative opportunities for both U.S. and FSU scientists and engineers. The awards announced in December 2001 brought the total number of grants to almost 700 and the total number of FSU scientists and engineers supported under the program since 1996 to over 4,000.

Industry Programs

The CRDF announced a new component to its suite of Industry Programs. The Partner Search program, announced in February, employs the CRDF's extensive array of resources and its database of scientific activities to assist U.S. companies in identifying potential partners in the former Soviet Union. This addition will strengthen the CRDF's already successful and innovative approach to widening U.S. industry's access to technology in the FSU.

Centers and Institution Building

In 2001 the CRDF expanded its pioneering efforts with large center-based projects. These projects, which now reach seven countries of the former Soviet Union, complement the CRDF's small-team research grants by focusing attention on the long-term issues of capital investment, institution building, and linking research with local economic needs.

The CRDF also strengthened its efforts to build science management capability in the FSU and to increase the acceptance of merit-based science funding through the creation of independent national foundations. The National Foundation of Science and Advanced Technologies in Armenia received a sizeable grant from the CRDF, allowing it to greatly expand its programs to develop Armenia's scientific infrastructure. The CRDF took the first steps toward the development of an analogous organization in Georgia, and it scaled up the Moldovan Research and Development Association, established in 2000. The latter organization implemented its inaugural programs in late 2000 and awarded the first grants of the Moldovan-U.S. Bilateral Grants Program in 2001.

Nonproliferation

Support for U.S. nonproliferation goals continued to play a major role in almost every CRDF program and activity. Over 50 percent of the CRDF's research grants in 2001 included scientists with weapons experience. By engaging them in civilian research, the CRDF is helping to ensure that these scientists will put their knowledge and skills to use in productive peaceful activities. In addition to its own funding activities, the CRDF remains a key partner in other U.S. Government nonproliferation efforts. Those efforts include U.S. participation in the multinational Science and Technology Center and the Defense Threat Reduction Agency's Cooperative Biodefense Research program. As a key partner, the CRDF provides a range of services including project review, development, and management support.

Grant Assistance Program

The Grant Assistance Program has provided assistance to numerous other organizations working in the former Soviet Union. An outgrowth of the CRDF's own internal mechanism to transfer funds and equipment, this innovative service program more than doubled the funds it transferred to the FSU on behalf of other organizations in 2001.

Evaluating Progress

The CRDF places great emphasis on evaluating the success of its programs. In 2001 the CRDF, together with the Royal Society (United Kingdom), hosted an international conference that looked at the past decade of Western support for science in Russia and Ukraine and identified priorities for the future.

The conference, titled "International Support of Science in Russia and Ukraine: A 10-Year Retrospective and Forward Look," brought together representatives from 12 countries. To keep the conference dialogue alive, the organizers put forward the idea of starting an international Internet-based affinity group of institutions that support science in Russia and Ukraine, to be hosted by the CRDF.

LOOKING AHEAD TO 2002

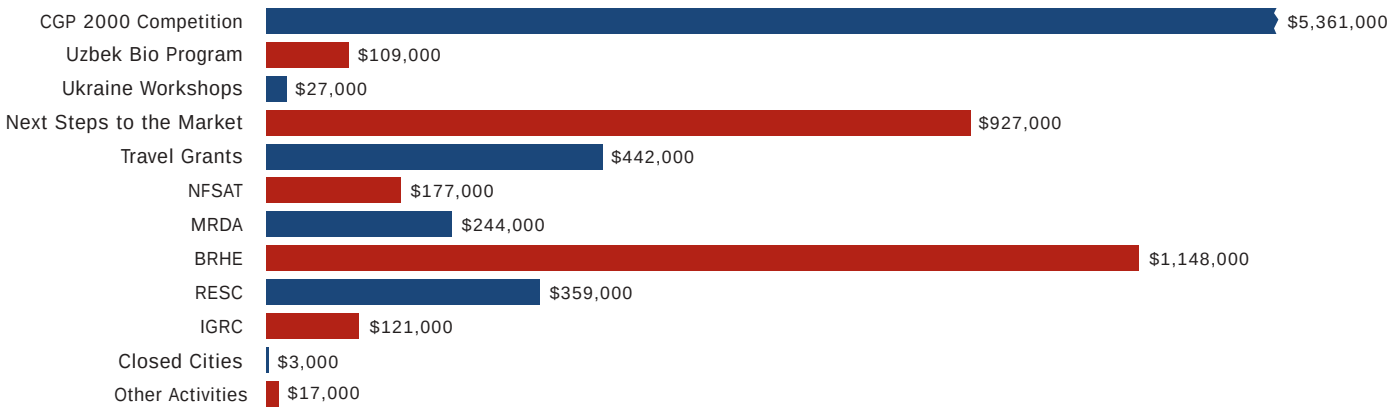
With a solid record of accomplishment and proven expertise, the CRDF finds itself in a position to exercise leadership in developing model programs to promote the health of science in the FSU in ways that are beneficial to international science and to U.S. interests.

While cooperative grants will remain a mainstay of the CRDF's programs, the foundation will continue to explore new and innovative approaches to address challenges in the countries of the FSU. As the Cooperative Grants Program enters its next competition, the CRDF will seek ways to complement its support for individuals and small teams of scientists with activities that support the scientific infrastructure of the countries of the FSU. Having already established independent grant-making organizations in Armenia, Moldova, and Georgia under its Centers and Institution Building programs, the CRDF is looking next to Azerbaijan. And under the Basic Research and Higher Education program, the CRDF expects to announce four new Research and Education Centers in Russia, bringing the total number of such centers to 16.

Nonproliferation remains a priority for the foundation. The CRDF has dedicated additional resources to nonproliferation and has announced a special anti-terrorism research competition in response to increased concerns following September 11, 2001. This competition will fund research focused on minimizing the impact of terrorism on civilian populations. In this effort, the CRDF will capitalize on its experience in working with FSU scientists—many of whom were at one time involved in the development of weapons of mass destruction, including nuclear, biological, and chemical weapons.

In the activities noted above and in all its programs, the CRDF will strive to continue its record of excellence.

FIGURE 2: CRDF 2001 Grant Expenditures by Program*



* Amounts do not include CRDF administrative costs

Cooperative Grants Program

Fostering collaboration in basic and applied research

2001 was a successful year for the CRDF's Cooperative Grants Program. The program, which provides long-term research grants to joint U.S.-FSU teams in all areas of basic and applied research, received a record number of proposals in 2001, while continuing to monitor and evaluate over 500 cooperative grants awarded since 1996.

The CRDF announced a third Cooperative Grants Program (CGP) competition in February 2001. The competition attracted over 1,600 proposals, representing a 30 percent increase from the previous competition.

There was an increase in applications received from countries other than Russia, and from Russian cities other than Moscow and St. Petersburg. The foundation attributed this increase in part to its intensified Centers and Institution Building efforts, especially in Armenia, Georgia, and Moldova, and its new web-based electronic proposal submission system, implemented in 2001. The new system widened access to competition guidelines and forms and facilitated interaction between American and former Soviet scientists during the application process.

Following a rigorous review process, involving administrative screening, external review, and panel evaluation, the CRDF selected 144 proposals for funding, a nine percent success rate. (See awards list, p. 14) Of the teams chosen, 43 percent included scientists or engineers formerly engaged in defense-oriented research in the former Soviet Union.

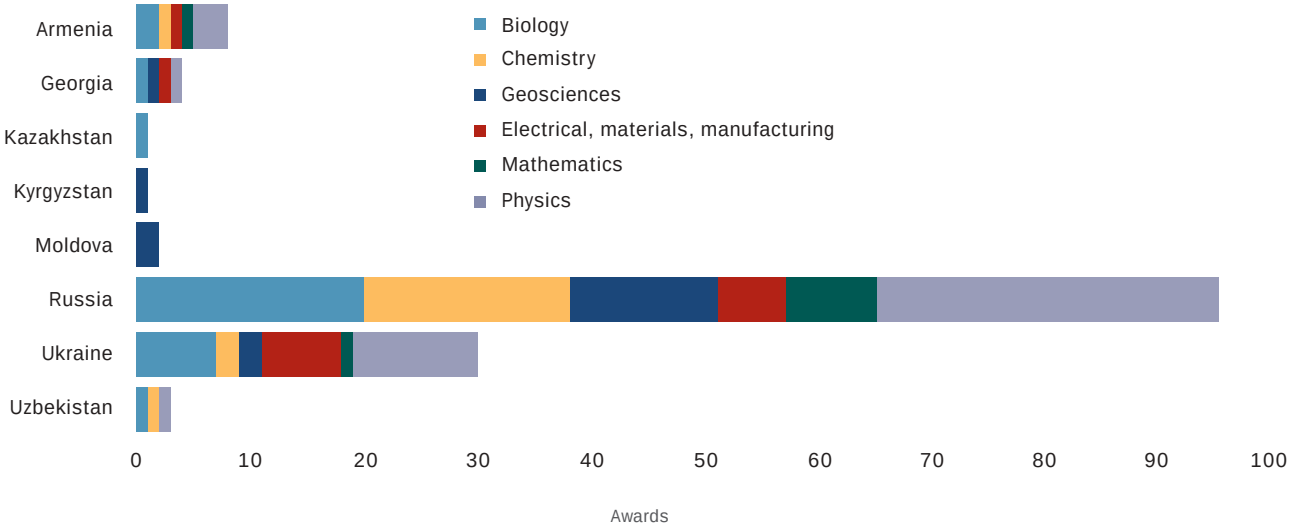
Figure 3 illustrates the distribution of 2001 CGP awards by discipline for individual countries. **Figure 4** shows the distribution by field of science and engineering.

CGP awards average $60,000 over two years, a total of approximately $9 million for the 2001 CGP grants. The funds provide individual financial support for FSU researchers, as well as equipment, supplies, and travel support of FSU participants and institutional support to the FSU grantee institution. The awards also cover the expenses of the U.S. team for travel, supplies, and graduate student stipends.

The CRDF anticipates announcing the next cycle of CGP competitions in 2002.

The U.S. Department of State, the National Institutes of Health, and the National Science Foundation (NSF) provided funding to the CRDF for the 2001 CGP competition. The Governments of Ukraine and Uzbekistan also contributed to projects in those countries.

FIGURE 3: Disciplinary Distribution by Country for 2001 CGP Awards



TARGETED ACTIVITIES

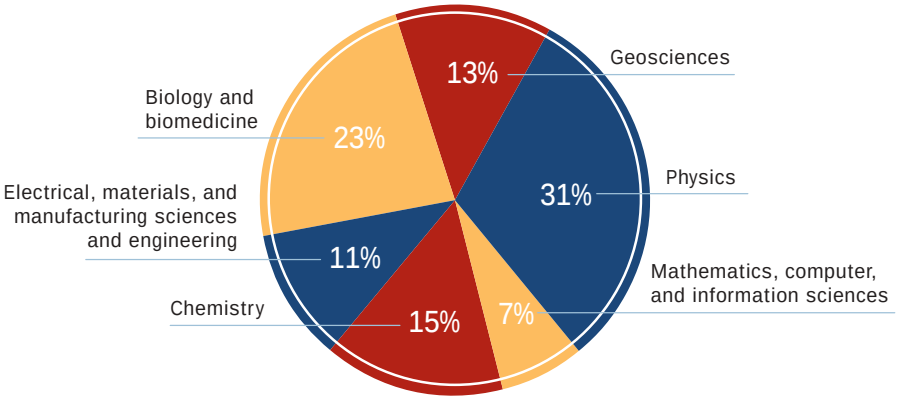
Proposal Development Workshops

To encourage new partnerships, especially in less-represented geographic or scientific areas, the CRDF periodically supports proposal development workshops to enable potential new U.S. and FSU collaborators to meet and plan future joint research efforts.

In 2001 the CRDF received funding from the NSF to support a new program of scientific workshops in the Caucasus. The workshops will offer opportunities for participants from the United States, Armenia, Azerbaijan, and Georgia to exchange information, establish partnerships, and develop joint research proposals for submission to the NSF, the CRDF, and multilateral programs. The CRDF anticipates that the series of workshops will begin in 2002.

The foundation conducted a similar program in Ukraine in 2000 and 2001, under which six proposal development workshops took place with NSF funding. Several hundred American and Ukrainian researchers participated in the workshops, 60 of them with CRDF support. The workshops helped participants to develop joint proposals, which they submitted to the CRDF, the NSF, and other funding organizations.

FIGURE 4: Distribution of 2001 CGP Awards By Field of Science and Engineering



Developing Proposal Skills

In addition to fostering partnerships, the CRDF places a strong emphasis on the development of proposal-writing skills. The CRDF also assists researchers with proposal development by holding proposal-writing seminars under its Institution Building program. These seminars provide FSU scientists and engineers, many of whom apply to the CGP, with the tools and experience necessary for grant writing. All CGP applicants are provided with anonymous verbatim reviews of their proposals, which they are encouraged to use when preparing future proposals to the CRDF or to other funding organizations.

Update from the Field

Addressing the Health Risk of Lead Contamination in Armenia

With support from a CGP 2000 award, Mihran Aslanyan of the Institute of Geological Sciences in Armenia and Mark D. Farfel of the Johns Hopkins School of Hygiene and Public Health are assessing the public health risk of environmental contamination caused by widespread toxic emissions of lead and other heavy metals in Armenia. They provided lead-detecting equipment and training to Armenian research facilities. The researchers also defined the risks and goals for a public awareness campaign to be initiated within the time frame of the project.

Mud Volcanoes in Azerbaijan

Supported by CGP 2000 funding, Fakhraddin Kadirov of the Geology Institute of Azerbaijan and Ian Lerche of the University of South Carolina are studying the formation and activation of the unique natural phenomenon of mud volcanoes in Azerbaijan. Their project features quantitative simulation with controls from gravimetric, geothermal, and geochemical data. The findings are expected to be useful in detection and assessment of gas and oil prospects, as well as in prediction of natural disasters.

Several Azerbaijani former defense scientists with missile technology expertise are participating in the project.

Optical-Electronic Pattern Recognition System

Under a CGP 2000 grant, Veacheslav Perju of the Technical University of Moldova and David Casasent of Carnegie Mellon University are developing an optical-electronic pattern recognition computer system for use in robotics, aircraft navigation, rocket control, radar scene processing, and medical image analysis.

The Moldovan team includes two former defense scientists who previously worked in missile guidance and control systems for the Moldovan defense ministry.

TOP LEFT Armen Hovhannisyan of Mihran Aslanyan's research group BOTTOM LEFT Activity around Lokbatan, a mud volcano near Baku, Azerbaijan RIGHT Nikolai Shiklomanov of Frederick Nelson's research team

Effects of Changing Climate and Vegetation in the Arctic

With funding from a CGP 2000 award, Oleg Anisimov of the State Hydrological Institute in Russia and Frederick Nelson of the University of Delaware developed a new method of modeling climate-vegetation-permafrost to study seasonal Arctic thaw depth and the effects of global warming. Their findings were entered into a computer information system to allow dissemination of results regarding environmental impacts of climatic change in cold regions. Dr. Anisimov gave a presentation to the environmental committee of the Russian Duma on the anticipated impacts of changing climate and permafrost on land-use planning.

Cooperative Grants Program—2001 Awards

(Listed alphabetically by country, field of science, and principal FSU investigator)

ARMENIA

BIOLOGY

Tadevosyan, Yuri Victor, Institute of Molecular Biology, AAS, Yerevan
Altman, Amnon, La Jolla Institute for Allergy and Immunology
Regulation of PKC-theta Recruitment to the T Cell Immunological Synapse and its Activation by Lipid Second Messengers

Trchounian, Armen, Yerevan State University, Yerevan
Nakamoto, Robert Kurato, University of Virginia
Direct Energy Coupling Between Bacterial Membrane Systems Via Dithiol-Disulfide Exchange

CHEMISTRY

Panosyan, Henrik Agavardovich, Molecular Structure Research Center, AAS, Yerevan
Pines, Alexander, University of California, Berkeley
Structure Determination of Biological Molecules Oriented in Liquid Crystalline Solvents

ELECTRONICS / MATERIALS / MANUFACTURING

Pogosian, Albert Knyazevich, State Engineering University of Armenia, Yerevan
Bahadur, Shyam, Iowa State University
Improvement of the Friction and Wear Properties of Polymer-Based and Lubricating Composites by Filling with Local Raw Materials and Minerals

MATHEMATICS / INFORMATION SCIENCES

Sarukhanyan, Hakob Gevorg, Institute of Informatics and Automation Problems, AAS, Yerevan
Petrosian, Arthur Ashot, Texas Tech University
Compression of Digital Signals Using Hybrid Hadamard-Wavelet Transforms

PHYSICS

Avagyan, Robert Hovsep, Yerevan Physics Institute, Yerevan
Bosted, Peter E., Stanford Linear Accelerator Center
Compton Polarimeter for Circularly Polarized High Energy Photons

Hakobyan, Rafik Sergey, Yerevan State University, Yerevan
Zel'dovich, Boris Yakov, University of Central Florida
Laser Driven Orientational and Hydrodynamical Instabilities in Liquid Crystals

Sirunyan, Albert M., Yerevan Physics Institute, Yerevan
Jones, Richard Thurston, University of Connecticut
Development of Precise Polarimetry of Coherent Bremsstrahlung Radiation in the Energy Range E=0.3-2 GeV Using Pair Production Processes on Nuclei and Atomic Electrons

GEORGIA

BIOLOGY

Eristavi, Marina, Institute of Botany, GAS, Tbilisi
Miller, James Spencer, Missouri Botanical Garden
Informatics for the Sustainable Use of Plant Genetic Resources in the Republic of Georgia

ELECTRONICS / MATERIALS / MANUFACTURING

Jalabadze, Nikoloz, Georgian Technical University, Tbilisi
Sarin, Vinod, Boston University
New Method for the Manufacturing of Refractory Metal Carbides and Hard Alloys

GEOLOGY

Didebulidze, Goderdzi George, Abastumani Astrophysical Observatory, Tbilisi
Kafkalidis, Julie Franklin, University of Michigan, Ann Arbor
Coupling Between Planetary and Small Scale Atmospheric Waves in the Mesosphere-Thermosphere Regions by Airglow Observations

PHYSICS

Khomeriki, Ramaz, Tbilisi State University, Tbilisi
Mullen, Kieran Joseph, University of Oklahoma
Nonlinear Dynamics in Coupled Quantum Wells

KAZAKHSTAN

BIOLOGY

Kayukova, Lyudmila Alexandrovna, Institute of Chemical Sciences, KAS, Almaty
Cynamon, Michael Henry, Veterans Affairs Medical Center
Derivatives of B-Aminopropioamidoximes as New Active and Nontoxic Tuberculostatics

KYRGYZSTAN

GEOLOGY

Manjikov, Batyr Tsebekovich, Institute of High Temperatures, Bishkek
Tullis, Terry E., Brown University
Investigation of Vibration Effects and Tidal Wave Asymmetry in Loaded Terrestrial Materials

MOLDOVA

GEOLOGY

Corobov, Roman Michail, National Center for Scientific and Applied Preventive Medicine, Chisinau
Knight, Chester Gregory, Pennsylvania State University
Comparative Integrated Assessment of Climate Change Consequences for the Republic of Moldova and the Mid-Atlantic Region of the United States.

Zaicenco, Anton, Institute of Geophysics and Geology, MAS, Chisinau
Gavin, Henri Phillippe, Duke University
Reliability of Advanced Base-Isolation for the Protection of Critical Facilities from Earthquake Hazard

RUSSIA

BIOLOGY

Apt, Alexander Solomonovich, Central Institute for Tuberculosis, Moscow
McMurray, David Neil, Texas A&M University
Comparative Immunogenicity and Protective Efficacy of Novel Tuberculosis Vaccines in Two Animal Models

Balaban, Pavel Miloslavovitch, Institute of Higher Nervous Activity and Neurophysiology, RAS, Moscow
Cohen, Lawrence B., Yale University School of Medicine
Mechanisms of Plasticity at Modulatory Neuron Axon Terminals

Belozersky, Mikhail Andreevich, Belozersky Institute of Physico-Chemical Biology, Moscow State University, Moscow
Oppert, Brenda, U.S. Department of Agriculture, Agricultural Research Service
Molecular Characterization of Digestive Proteinases in the Yellow Mealworm, Tenebrio Molitor

Bonch-Osmolovskaya, Elizaveta Aleksandrovna, Institute of Microbiology RAS, Moscow
Robb, Frank Thomson, Center of Marine Biotechnology
Reduction of Toxic Metals and Radionuclides by Thermophilic Prokaryotes

Chernyak, Yuri Ilyich, Institute of Occupational Health and Human Ecology, SBRAMS, Angarsk
Grassman, Jean Ann, Brooklyn College
An Epidemiological Study Examining the Impact of Exposure to Combustion Products Formed during the 1992 'Irkutskcable' Fire upon the Health of 'Shelekhov' Firefighters

Filonov, Andrei Evgenievich, Institute of Biochemistry and Physiology of Microorganisms, RAS, Pushchino
Petersen, James N., Washington State University
Horizontal Gene Transfer and Plasmid Enhanced Microbial Degradation of Polycyclic Aromatic Hydrocarbons

Fomina, Irina Removna, Institute of Basic Biological Problems, RAS, Pushchino
Herbert, Stephen Karl, University of Wyoming
A Study of the Physiological Roles of Antioxidants in Photosynthetic Cells Using Cyanobacteria as a Genetic System

Georgieva, Sofia Georgievna, Institute of Gene Biology, RAS, Moscow
Kadonaga, James T., University of California, San Diego
Novel Transcription Factors Involved in the Activation of Transcription from Downstream Promoter Element (DPE)

Gulyaeva, Lyudmila Fedorovna, Institute of Molecular Biology and Biophysics, Novosibirsk
Rice, Robert Hafling, University of California, Davis
Mechanism of Cytochrome P450 2B Gene Activation by Triphenyldioxane in Rat Liver

Assessing the Impact of Collaboration

The CRDF has a strong interest in understanding the results and impacts of its programs and those of other organizations that support science and technology in the former Soviet Union. To help gather such information, the CRDF jointly sponsored a conference with the Royal Society (United Kingdom) in October 2001 titled "International Support of Science in Russia and Ukraine: A 10-Year Retrospective and Forward Look."

Scientists, program administrators, and government representatives from 12 countries convened in London for the conference. Opened by Nobel Laureate Zhores Alferov, the event presented participants with a rare opportunity to share experiences and lessons learned.

Conference participants focused on the impacts of Western programs in three key areas deemed critical to the future of science and technology in Russia and Ukraine: supporting young researchers; bridging the gap between basic and applied research; and supporting infrastructure and research systems. By the end, participants recognized the emergence of several overarching themes, including a general agreement that the time for assistance-only programs was over, and that future efforts must emphasize scientific cooperation.

Participants concluded that the primary benefit of the conference was the opportunity for parties that normally work in parallel to have an interactive discussion in which they identified common goals and problems and engaged in debate and dialogue. To keep the dialogue alive, the conference organizers put forward the idea of starting an international Internet-based affinity group of institutions that support science in Russia and Ukraine. The CRDF expects to launch the affinity group in 2002.

The Royal Society, the John D. and Catherine T. MacArthur Foundation, and the NSF provided funding for the conference.

ABOVE Zhores Alferov, Nobel Laureate, Director of the Ioffe Institute, and Vice-President of the Russian Academy of Sciences and President of its St. Petersburg Scientific Center

Ivanova, Galina Alexandrovna, Sukachev Institute of Forest, SBRAS, Krasnoyarsk
Conard, Susan Gould, U.S. Department of Agriculture, Forest Service Research
Modeling and Monitoring Effects of Area Burn and Fire Severity on Carbon Cycling, Emissions, and Forest Health and Sustainability in Central Siberia

Krupitsky, Evgeny M., St. Petersburg Center for Research in Addiction and Psychopharmacology, St. Petersburg
Krystal, John H., Veterans Affairs Connecticut Healthcare System
Memantine Effects on Craving in Alcoholic Subjects

Melnikov, Igor Alexseevich, Institute of Oceanology, RAS, Moscow
Sherr, Barry F., Oregon State University
Sea Ice Biology in Recent Environmental Changes in the Arctic

Novoselov, Vladimir Ivanovich, Institute of Cell Biophysics, RAS, Pushchino
Nathan, Carl F., Cornell University Medical College
Comparative Studies of Mammalian 1-Cys and 2-Cys Peroxiredoxins: Role in Antioxidant Defense against Toxic Effects of Reactive Oxygen Species and Peroxynitrite

Prokhortchouk, Egor Borisovitch, Institute of Gene Biology, RAS, Moscow
Reynolds, Albert B., Vanderbilt University
Role of Kaiso in Cell Growth, Proliferation and Differentiation

Rogovin, Konstantin Aleksandrovich, Institute of Ecology and Evolution, RAS, Moscow
Randall, Janet A., San Francisco State University
Population Ecology and Social Demography of the Great Gerbil (Rhombomys opimus, Licht): Factors of Size and Stability of Family Groups in a Social Rodent

Scherbina, Konstantin Konstantinovich, St. Petersburg Center for Expertise, Prosthetics and Rehabilitation, St. Petersburg
Pitkin, Mark, Tufts University
Biomechanical Evaluation of the Prosthetic Rolling Joint Foot and Development of a Methodology to Minimize Pressure on the Stump

Projects at a Glance

Investigation of Energy Release During Fault Formation in Rocks

Batyr Manjikov of the Institute of High Temperature Physics, Russian Academy of Sciences, Bishkek, Kyrgyzstan and Terry Tullis of Brown University developed a physical model of energy release and elastic wave excitation during fault formation in rocks. The model will help to quantitatively describe the effect of weak low-frequency vibrations on the rate of dilatant strain in heterogeneous materials. The model was tested on two types of terrestrial materials, granite from the Kainda deposit and marble from the Chychkan deposits in Kyrgyzstan. The results will be important in designing technical and power systems for applications in seismology, physical mesomechanics, and geophysics.

To complete the work, the researchers utilized the expertise and resources of the International Geodynamics Research Center (IGRC), a CRDF-supported center near Bishkek. The IGRC provides a research base for geoscientists studying the Tien Shan and other mountain ranges in Central Asia.

Water Temperature and Ice Thickness Variations in the Arctic Ocean

Alexander Gavrilov of the Shirshov Institute of Oceanography in Moscow is working with Peter Mikhailevsky of Science Applications International Corporation to conduct acoustic observations of mesoscale, seasonal, and interannual variations of water temperature and ice thickness over transoceanic paths in the Arctic Ocean. The researchers recovered over two years of data from the Lincoln Sea. They discovered a rise in temperature in the intermediate layer of the Nansen Basin of the Atlantic Ocean. The scientists also established that with low-frequency acoustics they are able to remotely measure variations in temperature, a task that cannot be completed by other means. Drs. Gavrilov and Mikhailevsky have presented their work at six conferences.

Shakhova, Natalja Mikhailovna, Institute of Applied Physics, RAS, Nizhny Novgorod
Richards-Kortum, Rebecca, University of Texas, Austin
Development of Methods for Early Diagnostics of Neoplasia Using Optical Coherence Tomography

Shuvaeva, Tatiana Maratovna, Shemyakin and Ovchinnikov Institute of Bioorganic Chemistry, RAS, Moscow
Mustelin, Tomas Mikael, University of California, San Diego
The Role of Phosphatidylinositol Target-45kDa Secretory Protein in Cell Function

Vartapetian, Andrey Borisovich, Belozersky Institute of Physico-Chemical Biology, Moscow State University, Moscow
Rudensky, Alexander, University of Washington
A Novel Surface Marker of Apoptotic Cells

Zaraisky, Andrey Georgievitch, Shemyakin and Ovchinnikov Institute of Bioorganic Chemistry, RAS, Moscow
Grainger, Robert M., University of Virginia
Investigation of Early Forebrain Development by Use of Stable Transgenic Frog Lines and Novel Fluorescent Reporter Proteins

CHEMISTRY

Alfimov, Michael Vladimirovich, Photochemistry Center, RAS, Moscow
Saltiel, Jack, Florida State University
Novel Fluorescent Ditopic Receptors Based on Chromophoric Crown Ethers as Promising Elements in the Optical Sensors for Biomedical and Environmental Applications

Bakulev, Vasiliy Alekseevich, Ural State Technical University, Ekaterinburg
Padwa, Albert, Emory University
Theory and Application of Heteroelectrocyclic Reactions in Organic Synthesis

Balakin, Alexander Alexeevich, Institute of Energy Problems of Chemical Physics, RAS, Chernogolovka
Baldwin, Michael Alexander, University of California, San Francisco
Direct Field Stimulated Evaporation of Ions from Liquids Using Membranes with Channels of Nano-Meter Size: Fundamental Aspects and Applications in Bio-organic Mass Spectrometry

Bochkarev, Mikhail Nikolaevich, Razuvaev Institute of Organometallic Chemistry, RAS, Nizhny Novgorod
Evans, William John, University of California, Irvine
Molecular Compounds of Divalent Neodymium, Dysprosium and Thulium; Development of Synthesis and Investigation of Chemical Properties

Bukhtiyarov, Valerii Ivanovich, Boreskov Institute of Catalysis, SBRAS, Novosibirsk
Goodman, Wayne D., Texas A&M University
Catalysis by In-Situ Generated Oxidants

Kholdeeva, Oxana Anatolievna, Boreskov Institute of Catalysis, SBRAS, Novosibirsk
Hill, Craig Livingston, Emory University
Polyoxometalate-Fabric Catalysts for the Purification of Polluted Air in Human Environments

Korobeinichev, Oleg Pavlovich, Institute of Chemical Kinetics and Combustion, SBRAS, Novosibirsk
Westbrook, Charles, Lawrence Livermore National Laboratory
Search of Organophosphorus Compounds (OPC) Fire Suppressants and Development of Mechanisms of OPC Flame Suppression Through Laboratory-Scale Experiments and Detailed Numerical Modeling

Korolev, Vladimir Alekseevich, Khlopin Radium Institute, St. Petersburg
Herbst, Scott Ronald, Idaho National Engineering Laboratory
Fundamental Chemistry of Organic Extractants: Mixtures of Chlorinated Cobalt Dicarbollyde and Organophosphorus Compounds for the Separation of Actinides from High Level Wastes

Koroleva, Olga Vladimirovna, Bakh Institute of Biochemistry, RAS, Moscow
Hendrich, Michael P., Carnegie Mellon University
Engineering, Kinetic and Spectral Studies of Laccase Chemical Mutants for Enzyme Application in Bioremediation and Biodegradation

Leshina, Tatyana Victorovna, Institute of Chemical Kinetics and Combustion, SBRAS, Novosibirsk
Grissom, Charles B., University of Utah
Spin Effects in Enzymatic Oxidations Catalyzed by Horseradish Peroxidase

Manevitch, Leonid Isakovich, Semenov Institute of Chemical Physics, RAS, Moscow
Kyu, Thein, University of Akron
Phase Behavior of Some Heteropolymer Systems of Practical Importance: Theoretical and Experimental Study

Minkin, Vladimir Isaakovich, Institute of Physical and Organic Chemistry, Rostov
Hoffmann, Roald, Cornell University
Non-classical Organoelement Structures with Hypercoordinated Centers and Non-Standard Stereochemistry

Nemukhin, Alexander Vladimirovich, Moscow State University, Department of Chemistry, Moscow
Burt, Stanley Kenneth, National Institutes of Health, National Cancer Institute
Development of Methodology for Studying Chemical Reactions in Condense Phases: Application to Biochemistry

Popovitcheva, Olga Borisovna, Moscow State University, Skobeltsyn Institute of Nuclear Physics, Moscow
Ravishankara, Akkihebbal Ramaiah, U.S. National Oceanographic and Atmospheric Administration
Cloud Condensation Nuclei Production by Soot Reactions with Aircraft Exhaust in the Upper Troposphere

Semenov, Alexey Yurievich, Belozersky Institute of Physico-Chemical Biology, Moscow State University, Moscow
Golbeck, John Harvey, Pennsylvania State University
Investigation of Kinetics and Thermodynamics of Electron Transport Reactions on the Acceptor Side of Photosystem I Complexes

Skubnevskaya, Galina Innokentievna, Institute of Chemical Kinetics and Combustion, SBRAS, Novosibirsk
Tsang, Wing, National Institute of Standards and Technology, Gaithersburg
Fundamental Investigations of Photochemical Aerosol Formation Initiated by Organic Free Radicals and Ozone in Aldehyde Vapor

Stoyanov, Evgenii Stepanovich, Boreskov Institute of Catalysis, SBRAS, Novosibirsk
Reed, Christopher A., University of California, Riverside
Infrared Studies on the Nature of the Solvated Proton

Volodin, Alexander Mikhailovich, Boreskov Institute of Catalysis, SBRAS, Novosibirsk
Klabunde, Kenneth John, Kansas State University
Nanocrystalline Oxides as Novel Catalytic Materials and Destructive Sorbents for Hazardous Compounds: Relationship Between Synthesis, Structure and Reactivity

ELECTRONICS / MATERIALS / MANUFACTURING

Deryugin, Yevgenii Yevgen'evich, Institute of Strength Physics and Material Science, SBRAS, Tomsk
Barlat, Frederic, Aluminum Company of America
Mesomechanics of Deformation and Fracture for Aerospace Aluminum Alloys Under Bending Conditions

Klassen, Nikolay Vladimirovich, Institute of Solid State Physics, RAS, Chernogolovka
Derenzo, Stephen Edward, Lawrence Berkeley National Laboratory
Studies on the Development of Economic Technologies of Manufacturing Effective Solid Scintillators with Application of Deformation and Thermochemical Processes

Nikanorov, Stanislav Prokhorovich, Ioffe Physico-Technical Institute, RAS, St. Petersburg
Wilcox, William R., Clarkson University
Novel Approach to the Development of Advanced Aluminum Alloys Using Levitation and Centrifugation

Seplyarskii, Boris Semenovich, Institute of Structural Macrokinetics and Materials Science, RAS, Chernogolovka
Williams, Forman Arthur, University of California, San Diego
Ignition and Combustion of a Solid Particle Suspension in Gas Containing an Oxidant and a Combustible Component

Shneerson, German Abramovich, St. Petersburg State Technical University, St. Petersburg
Shneider-Muntau, Hans J., National High Magnetic Field Laboratory
Quasi Force-Free Solenoid for the Generation of Superstrong Magnetic Fields: Concept, Computer and Experimental Modeling

Timoshenko, Victor Yurevich, Moscow State University, Department of Physics, Moscow
Tsybeskov, Leonid, New Jersey Institute of Technology
Electronic and Optical Phenomena in Anisotropic Assemblies of Silicon Nanocrystals

GEOLOGY

Adushkin, Vitaly Vasilievich, Institute of Dynamics of Geospheres, Moscow
Richards, Paul Granston, Columbia University
Inference of Possible Motions of the Earth's Inner Core, Derived from Characteristics of Seismic Phases Generated by Underground Nuclear Explosions

Balin, Yurii Stepanovich, Institute of Atmospheric Optics, SBRAS, Tomsk
Winker, David Michael, NASA Langley Research Center
Laser Sensing of Cloud Fields with Spaceborne Lidar

Burakov, Boris E., Khlopin Radium Institute, St. Petersburg
Hanchar, John M., George Washington University
Synthesis and Characterization of Monocrystalline Zircon Doped with 239Pu

Esipov, Igor Borisovich, Andreyev Acoustics Institute, RAS, Moscow
Johnson, Mark A., University of Alaska, Institute of Marine Science
Development of Methods for Remote Acoustical Sensing of Ocean Temperature and Stream Velocity with Special Application to Fram Strait Monitoring

Gavrilov, Alexander Nikolayevitch, Shirshov Institute of Oceanography, RAS, Moscow
Mikhalevsky, Peter, Science Applications International Corporation
Remote Observations of Large-Scale Changes of Water Temperature and Salinity in the Arctic Ocean Using Acoustics

Goldin, Sergey Vasilievich, Institute of Geophysics, SBRAS, Novosibirsk
de Hoop, Maarten V., Colorado School of Mines
True-amplitude Seismic Imaging

Kashin, Felix Vladimirovich, Institute of Experimental Meteorology, Science and Production Association, Obninsk
Tans, Pieter P., Climate Monitoring and Diagnostics Laboratory, NOAA
Studies of Carbon Dioxide, Methane and Carbon Oxide Concentration and Variability in the Atmosphere over the European Territory of Russia

Kravtsov, Yurii Alexandrovich, Institute of Space Research, RAS, Moscow
Sletten, Mark Arthur, Naval Research Laboratory
Microwave Backscatter from Mesoscale Breaking Waves on the Sea Surface: Experimental Investigation and Model Development

Lavrentiev, Mikhail Mikhailovich, Jr., Institute of Mathematics, SBRAS, Novosibirsk
Gonzalez, Frank I., U.S. National Oceanographic and Atmospheric Administration
Data Assimilation and Inversion Scheme for Real-Time Tsunami Forecasting

Pozdniakov, Sergey Pavlovich, Moscow State University, Department of Geology, Moscow
Tsang, Chin-Fu, Lawrence Berkeley National Laboratory
Preferential Flow Paths in Subsurface Heterogeneous Formations: Theory, Field Evidence and Simulation

Sobolev, Nikolai Vladimirovich, United Institute of Geology, SBRAS, Novosibirsk
Liou, Juhn-Guang, Stanford University
Diamond Formation in Ultrahigh Pressure Metamorphic Rocks

Tychkov, Sergei Anatolievich, Institute of Geology, SBRAS, Novosibirsk
Hager, Bradford Hoadley, Massachusetts Institute of Technology
Spatial-Temporal Variations of Modern Crustal Deformations of the Intracontinental Active Zones in Central Asia from the Data of Satellite Geodesy and Seismology

Yakushev, Evgeniy Vladimirovich, Shirshov Institute of Oceanography, RAS (Southern Branch), Gelendzhik
Murray, James W., University of Washington
Black Sea Oxic-Anoxic Interface Chemical System Temporal Variability: Field Observations and Modeling

MATHEMATICS / INFORMATION SCIENCES

Bondal, Alexei Igorevich, Steklov Mathematics Institute, RAS, Moscow
Lunts, Valery, Indiana University, Bloomington
Derived Categories in the Context of Mirror Symmetry and Noncommutative Algebraic Geometry

Burago, Yuriy Dmitrievich, Steklov Mathematics Institute, RAS, St. Petersburg
Alexander, Stephanie Brewster, University of Illinois, Urbana-Champaign
Geometry of Riemannian, Alexandrov and Finsler Spaces

Ilyashenko, Yulij Sergevich, Independent University of Moscow, Moscow
Guckenheimer, John, Cornell University
Selected Problems of Real and Complex Dynamical Systems: Partially Hyperbolic Attractors, Local and Nonlocal Bifurcations, Skew Products, Bifurcations in Slow-Fast Systems, Restricted Versions of the Hilbert 16 th Problem, Analytic Foliations

Khoroshkin, Sergei Mikhailovich, Institute of Theoretical and Experimental Physics, Moscow
Varchenko, Alexander, University of North Carolina, Chapel Hill
Knizhnik-Zamolodchikov Equations, Universal R-Matrix and Integrable Models

Projects at a Glance

Innovations in Long-Distance Medicine

Arthur Petrosian of Texas Tech University and Hakob Sarukhanyan of the Institute for Informatics and Automation Problems in Armenia plan to develop new signal compression techniques to electronically transmit X-rays and other medical images and information. The technology will be extremely useful in disaster situations, allowing physicians to compress and send large amounts of data via existing telecommunications routes without overloading the recipient's storage and transmission capabilities.

New Alloys for Equipment Manufacturing

Vinod Sarin of Boston University and Nikoloz Jalabadze of the Georgian Technical University in the Republic of Georgia are investigating the production of hard alloys with nanocrystalline components for use in manufacturing cutting tools, boring heads, and other pieces for oil production equipment. The new alloys could improve wear-resistance and high-temperature strength properties. The Georgian team includes nine former defense scientists.

Orevkov, Vladimir Pavlovich, Institute of Mathematics, RAS, St. Petersburg
Mints, Grigori, Stanford University
Efficient Strategies for Automated Reasoning Using Heuristic Algorithms for NP-Hard Problems and Decidable Fragments of Predicate Calculus

Pinchukov, Vladimir Ivanovich, Institute of Computational Technologies, SBRAS, Novosibirsk
Shu, Chi-Wang, Brown University
Implicit High Resolution Runge-Kutta Methods and Investigation of Nonstationary Phenomena in Aerodynamics and Astrophysics

Verbitsky, Mikhail Sergeevich, Independent University of Moscow, Moscow
Bogomolov, Fedor A., Courant Institute of Mathematical Sciences
Hyperkaehler Geometry and Singularities

Vishik, Marko Iosifovich, Institute of Information Transmission Problems, RAS, Moscow
Titi, Edriss S., University of California, Irvine
Attractors of Evolution Equations; Their Approximation and Homogenization

PHYSICS

Andreev, Alexander Feodorovich, Kapitza Institute of Physical Problems, RAS, Moscow
Duncan, Robert Vance, University of New Mexico
Defects and Excitations in Solid Helium

Barabanov, Igor Romanovich, Institute of Nuclear Research, RAS, Moscow
Hime, Andrew, Los Alamos National Laboratory
Development of the Yb Loaded Scintillator and its Purification from Radioactive Admixture for the LENS Project

Bogdanova, Ludmila Nikolaevna, Institute of Theoretical and Experimental Physics, Moscow
Akerib, Daniel S., Case Western Reserve University
Research and Development for an Experimental Measurement of the Antineutrino Magnetic Moment Using Ultra Low-Threshold Semiconductor Detectors and an Artificial Tritium Source of 40 MCi Activity

Projects at a Glance

Fighting Tuberculosis in Kazakhstan

With a second CGP grant, Michael Cynamon of the Veterans Affairs Medical Center and Lyudmila Kayukova of Kazakhstan's Institute of Chemical Sciences will build upon their earlier research to develop and test new treatments for tuberculosis. The project includes two former defense scientists.

Cotton and the Treatment of Cancer

Young Lin of Ohio State University and Takhir Aripov of Uzbekistan's Institute of Bioorganic Chemistry will identify and establish the optimal procedure for reducing the toxicity of gossypol, a naturally occurring polyphenolic pigment of the cotton plant that exhibits antiviral, anticancer, and antiparasitic properties. The researchers expect their findings to have an impact on the development of new pharmaceuticals for cancer treatment.

Ecologically Sound Pipelines

Yiannis Andreopoulos of the City University of New York and Vladimir Kushnir of the Marine Hydrophysical Institute in Ukraine are studying the effects of extreme ocean floor wave currents on submerged pipelines. Their work is ecologically and economically significant as it will help to ensure the stability of fuel-carrying near-shore pipelines.

Bunkin, Fedor Vasil'evich, General Physics Institute, RAS, Moscow
Hamilton, Mark Francis, University of Texas, Austin
Nonlinear Phase Conjugate Ultrasonic Beams for NDE and Acoustic Imaging

Donets, Evgueni Denisovich, Joint Institute for Nuclear Research, Dubna
Beebe, Edward Neil, Brookhaven National Laboratory
High Intensity Tubular Electron String Source of Highly Charged Ions: Experimental Proof and Basic Studies

Faenov, Anatoly Yakovlevich, Multicharged Ions Spectra Data Center of National Institute for Physical-Technical and Radiotechnical Measurements, Mendeleevo
Milchberg, Howard Michael, University of Maryland, College Park
High Intensity Pulsed X-Ray Source Based on Clusters Heated by Femtosecond Laser Radiation: Investigation and Optimization

Gavrin, Vladimir Nicolayevich, Institute of Nuclear Research, RAS, Moscow
Wilkerson, John Franklin, University of Washington
Measurement of the Solar Neutrino Flux using the Gallium Neutrino Telescope at the Underground Baksan Neutrino Observatory INR RAS

Golant, Victor Evgen'evich, Ioffe Physico-Technical Institute, RAS, St. Petersburg
Diamond, Patrick Henry, University of California, San Diego
Dynamic of Bifurcations in Plasmas

Gol'tsman, Grigory Naumovich, Moscow State Pedagogical University, Moscow
Blundell, Raymond, Smithsonian Institution Astrophysical Observatory
Terahertz Hot-Electron Bolometer Mixer for Ground-Based Radioastronomy

Karabadzhak, George Fevzievich, Central Research Institute of Machine Building, Korolev
Gallimore, Alec D., University of Michigan, Ann Arbor
Evaluation of Impurity Composition and Content in the TAL Hall Thruster at Various Operating Regimes

Khokhlova, Vera Aleksandrovna, Moscow State University, Department of Physics, Moscow
Crum, Lawrence A., University of Washington
Improved Diagnostic Ultrasound Imaging via Nonlinear Acoustics and Bubble Dynamics

Khonik, Vitaly Alexandrovich, Voronezh State Pedagogical University, Voronezh
Granato, Andy Vincent, University of Illinois, Urbana-Champaign
The Kinetics of Structural Relaxation and Plastic Deformation of Bulk Metallic Glasses

Latyshev, Yuri Il'ich, Institute of Radio Engineering and Electronics, RAS, Moscow
Boulaevskii, Lev Naumovich, Los Alamos National Laboratory
Studies of Interlayer Tunneling in Layered High-Tc Materials for the Development of New Superconducting Devices

Malyshenko, Stanislav Petrovich, Institute of High Temperatures, RAS, Moscow
Lloyd, John Raymond, Michigan State University
Investigations of New Effects in Interfacial Heat and Mass Transfer of Boiling and Evaporation in Micro-Scale Porous Materials

Mamaev, Yuri Alekseevich, St. Petersburg State Technical University, St. Petersburg
Clendenin, James Edwin, Stanford Linear Accelerator Center
Study of Spin-Polarized Electron Transport and Emission from New Strained Nanostructures with Enlarged Valence Band Splitting

Muratikov, Kyrill L'vovich, Ioffe Physico-Technical Institute, RAS, St. Petersburg
Rose, Douglas Nelson, U.S. Army Tank-Automotive and Armaments Command
Development of the Thermoelastic Photoacoustic Method for Detection and Imaging of Residual Stresses in Ceramics and Metals

Ovsyankin, Vladimir Vladimirovich, Vavilov State Optical Institute, RAS, St. Petersburg
Gibbs, Hyatt McDonald, University of Arizona
Dynamics of Induced Optical Anisotropy in Two-Dimensional Semiconductor Heterostructures

Ozhogin, Valery Ivanovich, Kurchatov Institute of General and Nuclear Physics, Moscow
Hellman, Frances, University of California, San Diego
Correlated Electronic State in Amorphous Gadolinium-Germanium and Gadolinium-Silicon Alloys

Pozanenko, Alexei Stepanovich, Institute of Space Research, RAS, Moscow
Hurley, Kevin, University of California, Berkeley
Rapid Follow-up Optical Observations of Cosmic Gamma-Ray Bursts

Rosanov, Nikolay Nikolaevich, Institute of Laser Physics, St. Petersburg
Christodoulides, Demetrios N., Lehigh University
Theorectical and Experimental Research of Nonparaxial Solitons: Optical Needles

Rubakov, Valery Anatolievich, Institute of Nuclear Research, RAS, Moscow
Rebbi, Claudio, Boston University
Computational Quantum Field Theory

Ryazanov, Valery Vladimirovich, Institute of Solid State Physics, RAS, Chernogolovka
Van Harlingen, Dale J., University of Illinois, Urbana-Champaign
Josephson pi-Junctions and New Physics of Superconducting Structures including pi-Junctions

Slysh, Viacheslav Ivanovich, Lebedev Physics Institute, RAS, Moscow
Fomalont, Edward Berel, National Radio Astronomy Observatory
High Resolution Imaging of Quasars and Cosmic Masers

Titov, Anatoly Vladimirovich, St. Petersburg Nuclear Physics Institute, RAS, Gatchina
DeMille, David Paul, Yale University
Investigation of the PbO Molecule for the Electron EDM Experiment

Urnov, Alexander Mikhailovich, Lebedev Physics Institute, RAS, Moscow
Seely, John F., U.S. Naval Research Laboratory
Development of a New-type XUV Optical Element for Solar Physics Research

Vakhrushev, Sergey Borisovich, Ioffe Physico-Technical Institute, RAS, St. Petersburg
Egami, Takeshi, University of Pennsylvania
Design of Relaxor-based Ferroelectrics through the Control of Composition and Mesoscopic Structure

Varfolomeev, Andrey Evgenievich, Kurchatov Institute of General and Nuclear Physics, Moscow
Bandyopadhyay, Supriyo, Virginia Commonwealth University
Novel Electronic Bistability in Self-Assembled Quantum Dots: Potential for Ultradense Static Random Access Memory

Vorobiev, Alexei Alexeievich, St. Petersburg Nuclear Physics Institute, RAS, Gatchina
Hertzog, David William, University of Illinois, Urbana-Champaign
Precision Measurement of the Singlet mu-p Capture Rate in Hydrogen Gas

Yakubovsky, Andrey Yurievich, Kurchatov Institute of General and Nuclear Physics, Moscow
Cheong, Sang-Wook, Rutgers University
Isotope Effect as a Probe of Charge/Orbital Ordering and Phase Separation in Magnetic Oxides

Zavyalov, Vitaly Vadimovich, Kapitza Institute of Physical Problems, RAS, Moscow
Smolyaninov, Igor I., University of Maryland, College Park
Experimental Study of Electrons Levitating above the Surfaces of Solid Cryodielectrics with Applications to Quantum-Computing

UKRAINE

BIOLOGY

Blagoi, Yurii Pavlovich, Institute of Low Temperature Physics and Engineering, UAS, Kharkiv
Nafie, Laurence Allen, Syracuse University
Elaboration of VCD Method to Study Meta -Ion Induced Structural Polymorphism of DNA and its Polypurine-Polypyrimidine Sequences

Chekhun, Vasyl Fedorovich, Kavetsky Institute of Experimental Pathology, Oncology, and Radiobiology, Kyiv
Gerner, Eugene W., University of Arizona
Role of Polyamines in Transcriptional Regulation of Genes Involved in Neoplastic Growth

Fedulova, Svetlana Anatolyevna, Bogomoletz Institute of Physiology, UAS, Kyiv
Augustine, George, Duke University
Calcium Dynamics at a Single Presynaptic Terminal of Cultured Hippocampal Neurons with Over-Expressed Synaptotagmin Gene Knock-Out Mice

Kharchenko, Vitaliy Alexandrovich, Institute of Zoology, UAS, Kyiv
Lichtenfels, J. Ralph, U.S. Department of Agriculture, Agricultural Research Service
Comparative Morphology, Phylogenetic Analyses and Classification of Strongylid Nematode Parasites of Equidae

Korchemskaya, Elena Y., Institute of Physics, UAS, Kyiv
Ebrey, Thomas G., University of Washington
Exploring Phototransformations of Bacteriorhodopsin and Its Mutants for Dynamic Holography and Real-Time Optical Information Processing

Sibirny, Andrei Andreevich, Institute of Cell Biology, UAS, Lviv
Cregg, James M., Keck Graduate Institute of Applied Life Sciences
Selected Autophagic Peroxisome Degradation in Yeast

Skok, Maryna Volodimyrivna, Palladin Institute of Biochemistry, UAS, Kyiv
Bahou, Wadie F., State University of New York, Stony Brook
Study of PAR-3 Expression and Function in Human Lymphocytes Using Blocking, Cleavage Site-Specific Antibodies

CHEMISTRY

Kartel, Mykola Tymofiyovych, Institute of Sorption and Problems of Endoecology, UAS, Kyiv
Odintsov, Boris Mikhailovich, University of Illinois, Urbana-Champaign
Biocompatible Carbon-Based Oxygen Sensors

Kurnosov, Vladimir Samuilovich, Institute of Low Temperature Physics and Engineering, UAS, Kharkiv
Wilson, Stephen R., New York University
Chemical and Physical Characterization of Molecular-Colloidal Solutions of Fullerenes and Fullerene Derivatives in Water

ELECTRONICS / MATERIALS / MANUFACTURING

Atanov, Gennadiy Alexeevich, Donetsk Open University, Donetsk
Geskin, Ernest Samuel, New Jersey Institute of Technology
Investigation and Application of Shock-based Water Acceleration

Bondarenko, Stanislav Ivanovich, Institute of Low Temperature Physics and Engineering, UAS, Kharkiv
Nakagawa, Norio, Iowa State University
Magnetic Scanning Microscope of High Spatial Resolution

Geletukha, Georgiy Georgievich, Institute of Engineering Thermophysics, UAS, Kyiv
Tuttle, Kenneth L., U.S. Naval Academy
Investigation of Combustion Mechanisms in Furnaces of Wood Fired Boilers

Kochelap, Viacheslav Aleksandrovich, Institute of Fundamental Problems for High Technology, Kyiv
Kim, Ki Wook, North Carolina State University
Terahertz Technologies for Microelectronics and Optoelectronics

Papirov, Igor' Isakovich, Kharkiv Institute of Physics and Technology, UAS, Kharkiv
Jacobson, Loren Arthur, Los Alamos National Laboratory
Investigation of the Process of Production of a High Purity Beryllium Using the Vacuum Distillation and Manufacture of the Quality Beryllium Ingot

Pyatak, Alexander Ivanovich, Kharkiv State Automobile and Highway Technical University, Kharkiv
Plummer, Mitty C., University of North Texas
Development of an Optimum Liquid Nitrogen Gasification Process for a Cryogenic Vehicle

Skorokhod, Valery Vladimirovich, Frantsevich Institute for Problems of Materials Science, UAS, Kyiv
Agrawal, Dinesh Kumar, Pennsylvania State University
Key Consolidation Processes for Fabrication of Dense Nanograined Ceramics and Engineering of Interfaces

GEOLOGY

Ivanov, Leonid Ivanovich, Marine Hydrophysical Institute, UAS, Sevastopol
Buesseler, Ken Owen, Woods Hole Oceanographic Institution
Modeling Alterations in Biogeochemical Cycles of the Black Sea Oxic/Anoxic Ecosystem in Response to Climate Change

Lemeshko, Yevgen Mihailovich, Marine Hydrophysical Institute, UAS, Sevastopol
Hopkins, Thomas Sawyer, North Carolina State University
Improved Methodology for Assessing the Impacts of the Aegean-Black Sea Exchange

MATHEMATICS / INFORMATION SCIENCES

Kochubei, Anatoly Naumovich, Institute of Mathematics, UAS, Kyiv
Thakur, Dinesh S., University of Arizona
New Trends in Non-Archimedean Analysis

PHYSICS

Efremov, Victor Alecseevich, Kharkiv State University, Kharkiv
MacAdam, Keith B., University of Kentucky
High Precision Microwave Spectroscopy of Quantum Defects in Rydberg States of Au and Al Atoms

Fomin, Valery Prokopievich, Crimean Astrophysical Observatory, Nauchny
Weekes, Trevor Cecil, Smithsonian Institution Astrophysical Observatory
Investigations of Very High Energy Gamma-Ray Sources Using Ground Based Cherenkov Telescopes

Freiman, Yuri Aleksandrovich, Institute of Low Temperature Physics and Engineering, UAS, Kharkiv
Hemley, Russel J., Carnegie Institution of Washington
Solid Hydrogens Under High Pressure: Phases I, II, III, and Beyond

Gritzay, Olena Olexandrivna, Institute of Nuclear Research, UAS, Kyiv
Binney, Stephen E., Oregon State University
The Development and Optimization of an Epithermal Neutron Source for BNCT Purposes at the Kyiv Research Reactor

Gurzhi, Radii Nikolaevich, Institute of Low Temperature Physics and Engineering, UAS, Kharkiv
Landman, Uzi, Georgia Institute of Technology
Nanowires as Generators of Super-Narrow Electron Distributions

Kolesnichenko, Yaroslav Ivanovych, Institute of Nuclear Research, UAS, Kyiv
White, Roscoe Beryl, Princeton University
MHD Phenomena and Superthermal Ions in Compact Axisymmetric and Quasi-Axisymmetric Plasma Tori

Kushnir, Vladimir Moses, Marine Hydrophysical Institute, UAS, Sevastopol
Andreopoulos, Yiannis, City University of New York
Hydrodynamic Interaction of the Near-Bottom Wave Current and Submerged Pipeline

Meleshko, Viatcheslav Vladimirovich, Institute of Hydromechanics, UAS, Kyiv
Adrian, Ronald J., University of Illinois, Urbana-Champaign
Modeling of the Dynamics of Hairpin Vortex Packets in Wall Turbulence

Rogacheva, Elena Ivanovna, Kharkiv State Polytechnic University, Kharkiv
Dresselhaus, Mildred Spiewak, Massachusetts Institute of Technology
Mechanisms Behind the Thermoelectric Properties of IV-VI-Based Low-Dimensional Structures and the Development of Materials with a High Figure of Merit

Shvayka, Andriy Mykhaylovych, Institute of Condensed Matter Physics, UAS, Lviv
Freericks, James Knox, Georgetown University
Theoretical Simulation of Electronic Raman Scattering Near a Metal-Insulator Transition

Sipatov, Alexander Yurievich, Kharkiv State Polytechnic University, Kharkiv
Giebultowicz, Tomasz Mieczyslaw, Oregon State University
Studies of Ferromagnetic Semiconductor Superlattices Based on IV-VI Compounds by Neutron and Synchrotron Radiation Scattering

UZBEKISTAN

BIOLOGY

Zakhidov, Erkin Agzamovich, Heat Physics Department, UzAS, Tashkent
Norris, James Rufus, University of Chicago
Development of Fluorescence Test Methods for Photosynthetic Systems and Estimation of Efficiency and Functioning of Purple Photosynthetic Bacteria

CHEMISTRY

Aripov, Takhir Fatikhovich, Institute of Bioorganic Chemistry, UzAS, Tashkent
Lin, Young C., Ohio State University
Low Toxic Gossypol: Preparation, Structure and Activity

PHYSICS

Dolmatov, Valeriy Konstantinovich, Starodubtsev Physical Technical Institute, UzAS, Tashkent
Manson, Steven Trent, Georgia State University
Atomic and Molecular Spectra beyond the Traditional Scope: Nondipole and Spatial Entrapment Effects

Industry Programs

Linking U.S. Industry with FSU Science

The CRDF's suite of Industry Programs encourages R&D partnerships between U.S. industry and FSU scientists and engineers. The Industry Programs consist of four key components: Next Steps to the Market, Partner Search, Commercialization Seminars, and Travel Grants.

The four Industry Programs work together and with other CRDF initiatives to widen U.S. industry's access to FSU expertise and technology. They also reduce the risks and cost to American companies entering into industrial partnerships with FSU institutes.

The programs provide former defense researchers in the FSU with the opportunity to transfer their skills and knowledge to civilian work. For example, over 80 percent of the 41 awards issued to date under Next Steps to the Market engage former defense scientists.

The Industry Programs continued growing in 2001, increasing the number of U.S. firms engaged with scientists and engineers in the former Soviet Union; reaching new participants, particularly outside Russia; and formalizing a new program, Partner Search.

Uzbek Welding Innovation Introduced to the United States

The dynamic interrelatedness of the CRDF's Industry Programs is illustrated by the experience of Rustam Saidov of the Agency for Promotion of Research and Innovation Projects in Uzbekistan. Dr. Saidov first approached the CRDF with a new welding technology for alloy materials—aerosolized fusion welding—that could double productivity and lower the manufacturing costs of welding various alloys. Through the CRDF's and the Department of Commerce's Training Program in Technology and Development and Marketing, a precursor to the CRDF's Commercialization Seminars and Partner Search Program, Dr. Saidov established contact with MB Industries, Inc., an Ohio-based welding products supplier.

Then, with funding from a CRDF Travel Grants Program award, he traveled to the United States to meet with MB Industries President, Michael Borges. The meeting resulted in an application to the CRDF for a joint Next Steps to the Market grant, which was awarded in 2001. The grant will help the U.S.-Uzbek partners to refine their product and to prepare the new welding technology for the U.S. market.

NEXT STEPS TO THE MARKET

Next Steps to the Market (NSTM), the core of the CRDF's Industry Programs, shares funding with American companies to encourage U.S.–FSU research collaborations, perform market research, develop business plans, and bring selected technologies closer to the marketplace. This approach enables entrepreneurs to introduce new economic opportunities that are of benefit to both the United States and the countries of the former Soviet Union.

NSTM awards average $125,000 and provide up to two years of support for FSU researchers.

In 2001 there was an increase of 50 percent in NSTM proposals submitted to the CRDF over the previous year. Of the 34 proposals submitted, 12 received awards, and an additional six were approved for funding in 2002. (See awards list, p. 30) Of the 12 projects funded, 10 involved former defense researchers. The total project value of the awards is approximately $4.25 million, of which $2.7 million comes from cash and in-kind contributions by U.S. companies.

TARGETED ACTIVITIES

NSTM Competition in Fuel Cells

In spring 2001, at the request of the W. Alton Jones Foundation, the CRDF and the Ministry of Industry, Science and Technologies of the Russian Federation convened a two-phase targeted competition to identify innovative Russian technical talent in fuel cells as an alternative energy source.

A proposal submitted by 3M and the Kurchatov Institute in Moscow was selected and will receive over $200,000 in funding. The U.S.-Russian team will work to develop a polymer electrode membrane (PEM) fuel cell alternative energy technology.

Funding from the W. Alton Jones Foundation allows the CRDF to leverage approximately three private sector dollars for every one CRDF dollar in the area of fuel cell research.

PARTNER SEARCH

The CRDF officially launched the newest of its Industry Programs, Partner Search, in February 2001. Partner Search employs the CRDF's extensive array of resources and its database of scientific activities to assist U.S. companies in identifying potential partner scientists, engineers, and institutions in the former Soviet Union.

In 2001 the program paved the way for industry-oriented R&D collaboration. Based on the information that they provided to the CRDF, participants received a list of potential collaborators, including all necessary company and contact information. The CRDF also helped participants contact those potential collaborators and assisted with visit logistics. Follow-on travel support and project funding were made available via the Travel Grants Program and Next Steps to the Market.

As of 2002, Partner Search will evolve into the First Step to the Market Program. Under this new program, the CRDF will share funding with U.S. companies for small R&D projects designed to engage FSU institutes as partners, to assess their capabilities, and to validate their technologies.

The Partner Search program is funded by the U.S. Department of State.

COMMERCIALIZATION SEMINARS

The CRDF continued its effort to enhance FSU scientists' understanding of the global business and legal environment for technology commercialization. The foundation held a Commercialization Seminar in Chisinau, Moldova, in March. Hosted under the auspices of the Moldovan Research and Development Association, the seminar drew 45 participants from 27 Moldovan institutions and companies.

Seminar leaders spoke on the business and legal processes of technology commercialization in the international marketplace. Their goal was to provide the participating scientists with the skills to move their technologies from the laboratory to the marketplace while protecting their intellectual property.

The commercialization seminar in Moldova was made possible by U.S. Department of Commerce funding.

Closing in on an Energy Source of the Future

The CRDF embarked on Partner Search projects for 12 fuel cell experts, from the former Russian closed cities of Sarov and Snezhinsk, who were all semifinalists of the Next Steps to the Market Fuel Cell Research Competition.

As a result, Connecticut-based Fuel Cell Energy, a leading developer of molten carbonate fuel cells, and the All Russian Institute of Experimental Physics are developing and improving new fuel cell materials as part of a U.S. Department of Energy Initiatives for Proliferation Prevention activity with Argonne National Laboratories. To date, materials account for about half the cost of fuel cell production. The goal of the program is to reduce production cost and improve the durability of fuel cell materials to make that alternative energy more market accessible.

Commercialization Seminars in Action

Igor Ciapurin of the State University of Moldova, a participant in the 2001 Commercialization Seminar, reported that the information imparted during the seminar—financing, patenting, and technology licensing—greatly helped him in his efforts to successfully commercialize his technology abroad.

A former defense scientist and expert in photothermoplastics, Dr. Ciapurin traveled to the United States to participate in the SPIE Optical Data Storage Meeting 2001; to discuss potential collaboration in the area of photothermoplastic materials in electro-optical and holographic devices with three U.S. for-profit companies; and to meet with representatives of the NASA Universities Space Research Association.

TRAVEL GRANTS PROGRAM

The Travel Grants Program (TGP) provides short-term travel support for FSU researchers to meet with U.S. companies to discuss and develop R&D partnerships. The purpose is to bring FSU scientists, engineers, and managers face to face with their American counterparts; to introduce them to the concepts of free-market commercial development; and to provide a setting for new collaborations.

The CRDF awarded 152 grants in 2001, bringing the total number of travel grants awarded since the program's inception to 350. (See awards list, p. 32) **Figure 5** shows the breakdown of the 2001 awards by country.

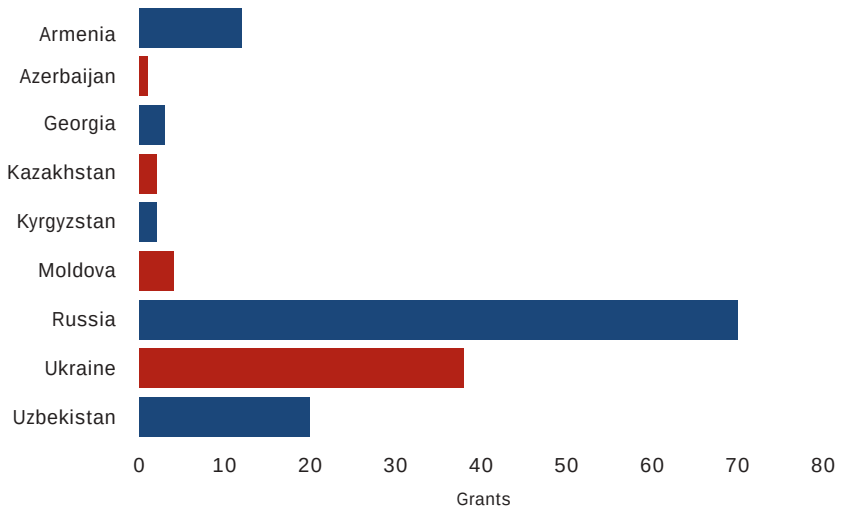
As with most of its grants programs, the CRDF gives special consideration in the TGP to former weapons researchers and to young scientists from closed cities and remote areas of the FSU. Of the 152 grants awarded in 2001, over 40 percent went to former weapons researchers, 25 percent to young scientists, and 16 percent to female investigators.

Travel grants often lead to Next Steps to the Market proposals or to applications to other CRDF programs or outside funding sources such as the IPP and ISTC. During 2001 twelve TGP participants reported working on collaborative research proposals.

In 2002 the CRDF hopes to increase the number of travel grants involving researchers from countries that have been underrepresented in the past. The CRDF also anticipates funding seminars, workshops, and focus programs at tradeshows and conferences in the United States and in the FSU through the TGP.

Funding for the Travel Grants Program is provided by the U.S. Department of State.

FIGURE 5: Distribution of 2001 TGP Grants by Country



Special Activities

Assessing Science and Technology Policy in Russia

Scientists, business leaders, and government officials from Russia and other FSU countries and from member and observer countries of the Organization for Economic Cooperation and Development (OECD) gathered in Helsinki in March to discuss the state of science and technology innovation in Russia. The meeting focused on current institutional settings, policies, and measures in Russia that enhance innovation and the application and commercialization of science and technology. The role of the country's government in nurturing innovation was examined. Participants also turned to lessons drawn from science and technology reforms and policy initiatives in OECD countries and discussed how those lessons could relate to Russia's case.

The event was jointly sponsored by the CRDF, the OECD, the Ministry of Trade and Industry of Finland, and the International Association for the Promotion of Cooperation with Scientists from the New Independent States of the former Soviet Union (INTAS), in cooperation with the Ministry of Industry, Science and Technologies of the Russian Federation.

Fostering Russian Venture Capitalism in Science and Technology

In partnership with Russian and international organizations, the CRDF cosponsored the second annual Russian Venture Fair in October in St. Petersburg. The fair's purpose was to provide competitively selected Russian enterprises with an arena in which to attract investment interest. It was attended by Russian, American, and European investors, advisers, bank and venture fund representatives, and venture capital experts.

Representatives of 40 fledgling Russian companies presented their firms and products and attended lessons-learned seminars conducted by Russian, European, and American venture capital experts.

Among the speakers was CRDF Board Member Fred Johnson, who talked about the importance of forming international R&D alliances as part of a fledgling company's quest to develop and commercialize a technology or product. CRDF staff described the Industry Programs and explained their objectives of moving applied research to the marketplace and bringing economic benefits to both the United States and the FSU.

The Russian Venture Fair, an annual event, is organized by the Russian Venture Capital Association (RVCA). Headed by Albina Nikkonen, the RVCA's goal is to develop and promote the growth of venture capitalism in Russia.

LEFT Fred Johnson (far left), with Boris Saltykov, President of Russian House Association of International Research and Development Cooperation; Dmitry Piscounov, Bureau Director Europe and NIS, UNIDO; Alfred Watkins, Leading Specialist, World Bank; and Alexander Yanchevsky, LETI, CEO of Lovanium

Next Steps to the Market Program—2001 Awards

(Listed alphabetically by U.S. principal investigator)

Amazeen, Paul, Imalux, Cleveland, OH
Sergeev, Alexander, Institute of Applied Physics, RAS, Nizhniy Novgorod, Russia
Commercialization of an Optical Coherence Tomography Device

Blinder, Dmitry, ViroGen Corp., Watertown, MA
Sidorenko, Svetlana, Kavetsky Institute of Experimental Pathology, Oncology & Radiobiology, Kyiv, Ukraine
Development of a Biotechnology Group for the Production of Monoclonal Antibody Kits

Borges, Michael, MB Industries, Inc., Wapakoneta, OH
Saidov, Rustam, Agency for Promotion of Research and Innovation Projects, Tashkent, Uzbekistan
Commercialization of New Welding Fluxes in the North American Market

Faust, Tom, Redwood Rubber, LLC, Corte Madera, CA
Abramov, Oleg, Institute of General and Inorganic Chemistry, Moscow, Russia
Pilot Scale Ultrasonic Devulcanization Process

Fulmer, John, GE Plastics, Mt. Vernon, IN
Dykman, Arkady, Petrophenol, L.L.C., St. Petersburg, Russia
Improvement of Phenol and Acetone Production

Johnson, Bruce, General Electric Company, Schenectady, NY
Igumenov, Igor, Institute of Inorganic Chemistry, SBRAS, Novosibirsk, Russia
Recovery and Regeneration of a Multicomponent Catalyst Containing Palladium

Kelner, Leonid, Plasma Flame Systems, Inc., Washington, DC
Matvyeyev, Ihor, Plasma-Tekhnika-Consult, Nikolaev, Ukraine
Design and Testing of Advanced Plasma Fuel Nozzles for Gas Turbine Engines

Klein, Marvin, Lasson Technologies, Inc., Danbury, CT
Shcherbin, Konstantin, Institute of Physics, Kyiv, Ukraine
Optimization of Photorefractive Cadmium Telluride for Laser Ultrasonic Receivers

Neugroschl, Dan, Chiral Photonics, Inc., Clifton, NJ
Shibaev, Valery, Department of Chemistry, Moscow State University, Moscow, Russia
New Polymer-Based Cholesteric Lasing Material

Schein, Jochen, Alameda Applied Sciences, San Leandro, CA
Tarasenko, Victor, Laboratory of Optic Radiation, High Current Electronics Institute, Tomsk, Russia
UV Xe-lamps with High Output Density for Diamond Switches

Sokolik, Igor, eMagin Corporation, Hopewell Junction, NY
Tolmachov, Oleksandr, Institute for Single Crystals, Kyiv, Ukraine
Color Changing Media for Color OLED Microdisplays

Williams, Todd, 3M, St. Paul, MN
Denisiuk, Igor, Just Optics, Ltd., St. Petersburg, Russia
High Refractive Index Nanocomposites

Projects at a Glance

Broadening Local U.S. Interest in FSU Science and Technology

The CRDF works with U.S. state-based economic development agencies and technology incubators to promote increased involvement of small- and medium-sized companies in joint projects with FSU researchers.

With added funding from the state of Ohio, an NSTM award for preliminary incubator space and business management support is helping a team of researchers from the (Moscow) Institute of Applied Physics and Ohio-based Imalux to commercialize a novel optical-coherence tomography device for early cancer detection.

Human Immune Response

ViroGen Corporation and the Kavetsky Institute of Experimental Pathology, Oncology & Radiobiology are continuing their work to develop a Ukrainian-U.S. production facility for low-cost high-quality monoclonal antibody kits. The partners hope to market the kits in Ukraine and also globally.

The initial CRDF project helped the collaborators to introduce four new products to the world market. It created a revenue stream for the Ukrainian partner from annual sales of $250,000 from the monoclonal antibody series. This project continues with a new research target of developing kits for lymphocyte immunophenotyping that will be licensed for research and diagnostic applications in Ukraine.

A former biodefense researcher is a member of the Ukrainian team.

RIGHT Robert Coltman of the University of Wisconsin (left) with Zhan K. Mustafin and Kairat G. Mustafin in one of the university's minituber greenhouses FAR RIGHT TOP John Fulmer (left) and David Sharber of GE Plastics FAR RIGHT BOTTOM Alexander V. Gektin (right) and E. Danylenko of Amcrys-H display a single-growth crystal plate developed in their laboratory

Increasing Kazakh Seed Potato Production through Biotechnology

In 2001 the CRDF continued its support of a Midwest Minitubers, Inc. and Kazakh Biotechnology Center project to optimize seed potato production in Central Asia.

The project combines the technical talent of Kazakh former defense scientists with U.S. business management talent to establish one of Central Asia's first tissue culture laboratories and screenhouses. The facility is expected to produce over 100,000 plantlets per year.

The collaboration, now in its second year, includes comparisons by Kazakh and American specialists of minituber and transplant yield performance levels in the field to determine how to optimize seed potato production in Central Asia. If the project is successful, the participants hope to capture up to 10 percent of the $85 million seed potato market in Kazakhstan.

The Kazakh team includes a scientist who previously worked as a biodefense researcher.

Reducing the Cost of Plastics Production

A team of researchers from GE Plastics and Russia-based Petrophenol, L.L.C. has been working on a project to retrieve phenol-acetone from waste products during plastics production.

Phenol and acetone are essential chemicals in the manufacture of plastics, but both are expensive. By creating a method to retrieve phenol-acetone from waste products, the project could significantly reduce the cost of plastics production, saving GE Plastics approximately $2 to $3 million per year. The researchers are also working on a method to remove impurities that cause discolorations in final plastic products.

The Russian team includes 10 former defense scientists with expertise in biodefense.

Improving Nuclear Medical Imaging Technologies

Researchers at Amcrys-H and Ukraine-based Proteus, Ltd. are working to introduce a reliable alternative supplier of gamma-ray camera crystal plates to the nuclear imaging industry.

The researchers are perfecting the growth, quality, and yield of NaI(TI) crystals for use in gamma camera detectors through new multi-point measurement procedures that improve crystal characteristics, such as increasing light output and reducing the level of impurities and other defects.

The team is currently working with customers in the United States for the testing, qualification, and sale of customized gamma camera detectors.

Travel Grants Program—2001 Awards

(Listed alphabetically by country and grantee with institutional affiliation and primary destination)

ARMENIA

Ananikan, Nerses
Yerevan Physics Institute, Yerevan
International Conference on Statistical Mechanics, Rutgers, The State University of New Jersey, New Brunswick, NJ

Asatryan, John
State Engineering University of Armenia, Gyumri
American Gear Manufacturers Association Annual Meeting, Detroit, MI

Barkhoudarian, Sarkis
Sarkan Engineering, West Hills, CA
NFSAT of Armenia, Yerevan

Bezirganyan, Siranush
Yerevan State University, Yerevan
2001 Spring Meeting of the Materials Research Society, San Francisco, CA

Khachatryan, Isabella
Scientific Research Institute of Physiotherapy, Yerevan
International Conference on LASERS 2001, Tucson, AZ

Mkrtchyan, Lilit
Institute of Mechanics, AAS, Yerevan
SPIE's 8th International Symposium on Smart Structures and Materials, Newport Beach, CA

Sargsyan, Davit
Yerevan State Medical University, Yerevan
Annual Meeting of the Society of American Gastrointestinal Endoscopic Surgeons, St. Louis, MO

Sargsyan, Norit
Laserayin Tekhnika CSC, Yerevan
International Conference on LASERS 2001, Tucson, AZ

Thorose, Levon
Thorose and Associates, Los Angeles, CA
NFSAT of Armenia, Yerevan

Trchounian, Armen
Department of Biophysics, Yerevan State University, Yerevan
101st General Meeting of the American Society for Microbiology, Orlando, FL

Vardanyan, Karen
Laboratory of Electrical and Electronic Systems, State Engineering University of Armenia, Yerevan
Sensors Expo Spring 2001, Chicago, IL

Yayloyan, Stepan
Institute of General and Inorganic Chemistry, AAS, Yerevan
Brown University, Providence, RI

AZERBAIJAN

Aliyev, Vugar
Institute of Physics, AzAS, Baku
7th International Interdisciplinary Conference on the Environment, San Francisco, CA

GEORGIA

Chikhradze, Nikoloz
Institute of Mining Mechanics, GAS, Tbilisi
TMS International Conference, Indianapolis, IN

Gelenidze, Medgar
Institute of Mining Mechanics, GAS, Tbilisi
TMS International Conference, Indianapolis, IN

Kvezereli, Manana Alexander
Tbilisi State Medical University, Tbilisi
The National Students Research Forum, The University of Texas Medical Branch, Galveston, TX

KAZAKHSTAN

Mansurov, Zulkhair
Al-faraby Kazakh State University, Almaty
18th International Colloquium on the Dynamics of Explosions and Reactive Systems, Seattle, WA

Yeskendirov, Nurlan
Karaganda State University, Karaganda
Strategic Management Services, New Orleans, LA

KYRGYZSTAN

Maripov, Arapbay
Kyrgyz Technical University, Bishkek
SPIE's International Symposium on Optical Science and Technology, San Diego, CA

Moldosanov, Kamil
Special Design Office OKB, AALAM, Bishkek
SPIE's International Symposium on Optical Science and Technology, San Diego, CA

MOLDOVA

Ciapurin, Igor
Department of Physics, State University of Moldova, Chisinau
DigiLens, Inc., Sunnyvale, CA

Constantinov, Boris
Technical University of Moldova, Chisinau
SPIE's 46th Annual Meeting, San Diego, CA

Craciun, Alexandru
Department of Industrial Chemistry, Moldova State University, Chisinau
INPEX XVII Exposition, Pittsburgh, PA

Focsa, Alexandru
Department of Applied Physics and Information, Moldova State University, Chisinau
National Renewable Energy Laboratory, Golden, CO

RUSSIA

Abramov, Oleg
Institute of General and Inorganic Chemistry, RAS, Moscow
BMC Industries, Inc., Cortland, NY

Abramov, Vladimir
Institute of General and Inorganic Chemistry, RAS, Moscow
BMC Industries, Inc., Cortland, NY

Alexeev, Boris
Moscow Fine Chemical Technology Institute, Moscow
1st MIT Conference on Computational Fluid and Solid Mechanics, Cambridge, MA

Ananikov, Valentine
Zelinsky Institute of Organic Chemistry, RAS, Moscow
Conference on Current Trends in Computational Chemistry, Jackson, MS

Andreev, Viktor Pavlovich
Institute for Analytical Instrumentation, RAS, St. Petersburg
3M, St. Paul, MN

Anikeev, Vladimir
Institute of Catalysis, Novosibirsk
ExxonMobil Research and Engineering, *Process Research Laboratory, Baton Rouge, LA*

Babushkin, Alexey
Ural State University, im. A.M. Gorkii, Ekaterinburg
NATO Advanced Research Workshop, Colorado State University, Pingree Park Campus, Boulder, CO

Belyaev, Victor
Cometa Central Research & Development Institute, Moscow
Optiva, Inc., San Mateo, CA

Benenson, Zalman
Scientific Council on Cybergenetics, RAS, Moscow
American Institute of Ultrasound in Medicine 2001 45th Annual Convention, Orlando, FL

Bokhonov, Boris
Institute of Solid State Chemistry, SBRAS, Novosibirsk
Eastman Kodak Corporation, Oakdale, MN

Bondarev, Dmitry Illarionovich
JSC Internet Projects, St. Petersburg
Annual New Jersey Venture Fair, Jersey City, NJ

Bormotova, Tatiana
Institute for High Energy Densities, IVTAN, RAS, Moscow
University of Texas, Arlington, TX

Budnikov, Konstantin
Institute of Automation and Electrometry, SBRAS, Novosibirsk
SPIE's Photonics East 2001, Boston, MA

Dykhne, Alexander
Moscow Institute of Physics and Technology, Moscow
Society for Information Displays 2001 Symposium, San Jose, CA

Faenov, Anatoly Yakovlevich
MISDC, National Institute for Physical-Technical and Radiotechnical Measurements, Mendeleevo, Moscow Region
Science Applications International Corporation, McLean, VA

Fedorova, Antonina
Institute for Problems of Mechanical Engineering, RAS, St. Petersburg
Fermi National Accelerator Laboratory, Batavia, IL

Filatov, Boris
South Center for Chemical Emergencies, Volgograd
Atlantic Logistics, Inc., Washington, DC

Finikova, Olga
Moscow State University, Moscow
222nd Meeting of the American Chemical Society, Chicago, IL

Fridman, Boris
Institute of Problems of Electrophysics, RAS, St. Petersburg
13th IEEE Conference on Pulsed Power, Las Vegas, NV

Golub, Victor
High Energy Density Research Center, RAS, Moscow
23rd International Shock Waves Symposium, Forth Worth, TX

Gradov, Oleg
Institute of General and Inorganic Chemistry, RAS, Moscow
BMC Industries, Inc., Cortland, NY

Gruzdev, Vitali
State Research Center, Vavilov State Optical Institute, St. Petersburg
SPIE's International Symposium on Optical Science and Technology, San Diego, CA

Gurfinkel, Yuri Ilich
Intensive Care Department, Central Clinical Hospital, Moscow
Dell Med Inc., Berwyn, PA

Isaenkova, Margarita Gennad'evna
Moscow Engineering Physics Institute, Moscow
Bruker Advanced X-ray Solutions, Madison, WI

Karyakin, Arkady
Moscow State University, Moscow
DRG International, Inc., Mountainside, NJ

Kim, Din Cher
Technical Design Institute of Applied Microelectronics, SBRAS, Novosibirsk
International Conference on Multiphase Flows, Tulane University, New Orleans, LA

Kokh, Alexander Egorovich
Institute of Mineralogy and Petrography, SBRAS, Novosibirsk
SPIE's International Symposium on Lasers 2001, San Jose, CA

Kuznetsov, Yuri Veneaminovich
St. Petersburg Institute of the Moscow State University of Printing, St. Petersburg
TAGA Annual Technical Conference, San Diego, CA

Loseva, Elena
Institute of Higher Nervous Activity and Neurophysiology, RAS, Moscow
BioScience, Inc., Dundee, IL

Makarov, Nikolai Sergeevich
St. Petersburg State Institute of Fine Mechanics and Optics, St. Petersburg
SPIE's Photonics West Conference 2001, San Jose, CA

Malaschonok, Gennadi Ivanovich
Tambov State University, Tambov
Wolfram Research Inc., Champaign, IL

Martyanov, Mikhail Gennadievich
JSC Internet Projects, St. Petersburg
Annual New Jersey Venture Fair, Jersey City, NJ

Masunov, Eduard
Moscow Engineering Physics Institute, Moscow
Steris Corporation, Libertyville, IL

Matveev, Boris Anatolievich
Ioffe Physico-Technical Institute, RAS, St. Petersburg
Schlumberger-Doll Research, Ridgefield, CT

Morozov, Igor
Semenov Institute of Chemical Physics, RAS, Moscow
Fifth International Conference on Chemical Kinetics, NIST, Gaithersburg, MD

Motlokhov, Vladimir Nikolaevitch
Sarov Open Computing Institute, Sarov
Analysis & Design Applications Co., Ltd., Melville, NY

Nesterenko, Dmitri
Image Processing Systems Institute, RAS, Samara
SPIE's 46th Annual Meeting, The International Symposium on Optical Science and Technology, San Diego, CA

ABOVE TGP grantee Alexander A. Ryabov, (seated, right) and Vladimir Gorev, Deputy Director, SOCC (seated, left) with the Sarov team

Nikishov, Vladimir Nikolaevich
Clinical Cancer Center, Kazan
Annual Meeting of the Society of American Gastrointestinal Endoscopic Surgeons, St. Louis, MO

Nizienko, Yuri
Moscow Institute of Physics and Technology, Moscow
Society for Information Displays 2001 Symposium, San Jose, CA

Perlovich, Yuriy Anatol'evich
Moscow Engineering Physics Institute, Moscow
Bruker Advanced X-ray Solutions, Madison, WI

Pesterev, Alexander
Institute for Systems Analysis, RAS, Moscow
Ford Motor Company, Dearborn, MI

Pikuz, Tatiana Alexandrovna
Bauman Moscow State Technical University, Moscow
Science Applications International Corporation, McLean, VA

Polyanskaya, Liubov Maximovna
Moscow State University, Moscow
BAICOR, Inc., Logan, UT

Popov, Eugeni
Ioffe Physico-Technical Institute, RAS, St. Petersburg
Particle Accelerator Conference 2001, Chicago, IL

Priezzhev, Alexander Vasilievich
Physics Department and International Laser Center, Moscow State University, Moscow
Dell Med Inc., Berwyn, PA

Reznik, Alexander
Institute of Automation and Electrometry, SBRAS, Novosibirsk
6th International Conference on Signal and Image Processing, Honolulu, HI

Ryabov, Alexander Alekseyevich
Sarov Open Computing Institute, Sarov
Analysis & Design Applications Co., Ltd., Melville, NY

Sankin, Georgii
Lavrentyev Institute of Hydrodynamics, Novosibirsk
142nd Meeting of the Acoustical Society of America, Fort Lauderdale, FL

Semenov, Semen Nikolaevich
Institute of Biomedical Physics, RAS, Moscow
Digichrom, Inc., Northbrook, IL

Shchennikov, Vladimir
Institute of Metal Physics, Ural Division of RAS, Ekaterinburg
SPIE's Micromachining and Microfabrication Conference, San Francisco, CA

Shimarov, Alexander Gennadievich
Sarov Open Computing Institute, Sarov
Analysis & Design Applications Co., Ltd., Melville, NY

Sokolov, Igor
Ioffe Physico-Technical Institute, RAS, St. Petersburg
Lasson Technologies, Culver City, CA

Sovloukov, Alexandre
Institute of Control Sciences, Moscow
Instrumentation, Systems, and Automation 2001 Conference and Exposition, Houston, TX

Stratonnikov, Alexander
Laser Biospectroscopy Laboratory, Natural Science Research Center of General Physics, Moscow
SPIE's Biomedical Optics Symposium BiOS 2001, San Jose CA

Tareyev, Sergey Anatolievich
Sarov Open Computing Institute, Sarov
Analysis & Design Applications Co., Ltd., Melville, NY

Tchernov, Vladimir
South Center for Chemical Emergencies, Volgograd
Atlantic Logistics, Inc., Washington, DC

Timofeyev, Igor
SRC VB Vector, Koltsovo
BioScience, Inc., Dundee, IL

Tsygankova, Lioudmila
Derzhavin State University, Tambov
200th Meeting of the Electrochemical Society, San Francisco, CA

Tuchin, Valery Victorovich
Saratov State University, Department of Optics, Saratov
Palomar Medical Technologies, Burlington, MA

Tyukhov, Igor Ivanovich
All-Russian Research Institute for Electrification of Agriculture, Moscow
ASES FORUM 2001—Solar Energy: The Power to Choose, Washington, DC

Ulyanov, Sergey Sergeevich
Saratov State University, Saratov
SPIE's Photonics West Conference 2001, San Jose, CA

Uvarov, Nikolai
Institute of Solid State Chemistry, SBRAS, Novosibirsk
Epoch Pharmaceutical, Inc., Bothell, WA

Varenik, Valery
MedBioExtreme Federal Directorate, Russian Ministry of Health, Moscow
Atlantic Logistics, Inc., Washington, DC

Volkova, Yana
Ural State University, im. A.M. Gorkii, Ekaterinburg
NATO Advanced Research Workshop, Colorado State University, Pingree Park Campus, Boulder, CO

Voronetski, Andrei Vladimirovich
Moscow State Technical University, Moscow
High Velocity Technologies, Inc., West Lebanon, NH

Yakovleva, Tatiana
Scientific Council on Cybergenetics, RAS, Moscow
American Institute of Ultrasound in Medicine 2001 45th Annual Convention, Orlando, FL

Zeitlin, Michael
Institute of Problems of Mechanical Engineering, RAS, St. Petersburg
Fermi National Accelerator Laboratory, Batavia, IL

Zharov, Vladimir Pavlovich
Moscow State Technical University, Moscow
IRV, Inc., Little Rock, AR

Zhuravlev, Konstantin
Institute of Semiconductor Physics, SBRAS, Novosibirsk
12th International Conference on Nonequilibrium Carrier Dynamics In Semiconductors, Santa Fe, NM

Zyrianov, Vladimir
Institute of Solid State Chemistry, SBRAS, Novosibirsk
Carpco, Jacksonville, FL

UKRAINE

Altman, Igor
Institute of Combustion & Advanced Technologies, Odessa
18th International Colloquium on the Dynamics of Explosions and Reactive Systems, Seattle, WA

Bohuslavsky, Alexander Sergeevich
Radioecological Center, UAS, Kyiv
Environmental and Water Resources Institute, International Cooperation Council, Orlando, FL

Boldeskul, Igor
Applied Physics Institute, UAS, Sumy
Bruker Optics, Milwaukee, WI

Boltovets, Mykola
Scientific Industrial Enterprise Orion, Kyiv
Automotive Technologies International, Detroit, MI

Boryskin, Artem
Institute of Radiophysics and Electronics, UAS, Kharkiv
Lucent Technologies, Murray Hill, NJ

Byelyayev, Oleksandr
Institute of Semiconductor Physics, UAS, Kyiv
Automotive Technologies International, Rochester Hills, MI

Castelli, Vittorio
Automotive Technologies International, Rochester Hills, MI
Final Technical and Project Applications Meeting, Kyiv

Chernenko, Volodymyr
Institute of Magnetism, UAS, Kyiv
Massachusetts Institute of Technology, Cambridge, MA

Chukova, Oksana
Kyiv National Taras Shevchenko University, Kyiv
10th International Conference on Photon Scattering in Condensed Matter, Hanover, NH

Dubovenko, Konstyantyn
Institute of Pulse Research and Engineering, UAS, Mykolayiv
Logicon, Inc., Arlington, VA

Fokin, Andrey
National Technical University of Ukraine, Kyiv
Natural Resources Research Institute Professional Conference, Duluth, MN

Gavrylov, Roland
Scientific Research and Development Bureau of the Low Temperature Physics and Engineering Institute, UAS, Kharkiv
Orbita Ltd., Silver Spring, MD

Kartel, Mykola
Institute of Sorption and Problems of Endoecology, UAS, Kyiv
Illinois EPR Research Center, Champaign, IL

Kats, Oleksandr
Institute of Radiophysics and Electronics, UAS, Kharkiv
Schukin Technical Enterprises, Corte Madera, CA

Khalatov, Artem
Institute of Engineering Thermophysics, UAS, Kyiv
46th International Gas Turbine Conference and Exhibition, University of New Orleans, New Orleans, LA

Klymenko, Valeriy
Institute for Surface Chemistry, UAS, Kyiv
Biospherical Instruments, Inc., San Diego, CA

Krvavych, Yuriy
Department of Mechanics and Mathematics, Kyiv National Taras Shevchenko University, Kyiv
32nd International ASTIN Colloquium & Casualty Actuarial Society Seminar on Reinsurance, Washington, DC

Lavrenko, Vladimir
Frantsevich Institute for Problems of Materials Science, UAS, Kyiv
NASA Glenn Research Center, Cleveland, OH

Mayevskyy, Stanislav Mihaylovich
National Technical University of Ukraine, Kyiv
Panametrics Inc., Waltham, MA

Mokhun, Igor
Chernivtsi National University, Chernivtsi
SPIE's International Symposium on Optical Science and Technology, San Diego, CA

Mydzian, Robert
Automotive Technologies International, Rochester Hills, MI
Final Technical and Project Applications Meeting, Kyiv

Nazarov, Alexei
Institute of Semiconductor Physics, UAS, Kyiv
Semiconductor Diagnostics, Inc., Tampa, FL

Nedilko, Sergiy
Kyiv National Taras Shevchenko University, Kyiv
10th International Conference on Photon Scatter in Condensed Matter, Hanover, NH

Panasyuk, Alla
Frantsevich Institute for Problems of Materials Science, UAS, Kyiv
NASA Glenn Research Center, Cleveland OH

Pavlov, Vadym Vyacheslavovich
Crimean State University of Medicine, Simferopol
2001 Annual Meeting of the Society for Comparative and Integrative Biology, Chicago, IL

Perezhogin, Sergey
Kharkiv Institute of Physics and Technology, Kharkiv
Particle Accelerator Conference 2001, Chicago, IL

Ponomorenko, Andrey
Menchikov Antiplague Research Institute, Odessa
Virion Systems, Inc., Rockville, MD

Prokopenko, Georgy
Institute for Metal Physics, UAS, Kyiv
Edison Welding Institute, Columbus, OH

Semenova, Natalia
Kharkiv State Scientific Research Institute of Metrology, Kharkiv
SPIE's International Symposium on Optical Science and Technology, San Diego, CA

Shevchuk, Olena
Kyiv National Taras Shevchenko University, Kyiv
SPIE's International Symposium on Optical Science and Technology, San Diego, CA

Sidorik, Lyudmila
Institute of Molecular Biology and Genetics, UAS, Kyiv
Expert BioMed, Inc., Surfside, FL

Starodub, Nickolaj
Palladin Institute of Biochemistry, UAS, Kyiv
SPIE's International Symposium on Environmental and Industrial Sensing and Intelligent Systems and Advanced Manufacturing, Boston, MA

Statyukha, Gennadiy
National Technical University of Ukraine, Kharkiv
GLATT Air Technologies, Ramsey, NJ

Strelko, Volodymyr
Institute of Sorption and Problems of Endoecology, UAS, Kyiv
The City College of the City University of New York, New York, NY

Terenetska, Iryna
Institute of Physics, UAS, Kyiv
Ocean Optics, Inc., San Diego, CA

Tishayev, Sergiy
SEC Biomass, Ltd., Kyiv
McNeil Technologies, Inc., Orlando, FL

Volchok, Oleg
Kharkiv Institute of Physics & Technology, UAS, Kharkiv
Cryogenic Engineering Conference and International Cryogenic Materials Conference 2001, Madison, WI

Zhelyezna, Tetyana
Institute of Engineering Thermophysics, UAS, Kyiv
5th Biomass Conference of the Americas, Orlando, FL

UZBEKISTAN

Abirov, Rustam
Institute of Mechanics and Seismic Stability of Structures, Tashkent
ASME International Mechanical Engineering Congress and Exposition, New York, NY

Adilova, Azadakhan
Institute of Genetics, Tashkent
41st Annual Meeting of the American Society for Cell Biology, Washington, DC

Boboyorov, Kamol
Nemat Oil Company, Samarkand
Galbraith Laboratories, Chicago, IL

Buranov, Anvar
Samarkand Chemical Plant, Samarkand
Bristol-Myers Squibb Company, Chicago, IL

Buriev, Tolibjon
Samarkand State University, Samarkand
Genomics, Inc., Chicago, IL

Eshpulatov, Barat
Department of Physics, Samarkand State University, Samarkand
IUVSTA/AVS-48/ICSS-11 Conferences, San Francisco, CA

Holikulov, Shodi Turdikulovich
Samarkand State University, Samarkand
American Chemical Society National Meeting, San Diego, CA

Hushmurodov, Shaymonkul
Samarkand State University, Samarkand
The Pittsburgh Conference 2001, New Orleans, LA

Isakulov, Erkin
Samarkand State University, Samarkand
222nd Meeting of the American Chemical Society, Chicago, IL

Ishniyazova, Shahista
Organic Chemistry Department, Samarkand Agricultural Institute, Samarkand
International Conference on LASERS 2001, Tucson, AZ

Khudayberdiev, Vitaly
Thermophysics Department, UzAS, Tashkent
SIAM Annual Meeting 2001, San Diego, CA

Muminova, Magfrat
Department of Genetics, Tashkent State University, Tashkent
2001 Congress on In Vitro Biology, St. Louis, MO

Nasretdinova, Manzura
Institute of Genetics, UzAS, Tashkent
University of Kentucky College of Agriculture, Lexington, KY

Osmanov, Sabri
Department of Physics, Samarkand State University, Samarkand
56th Symposium on Molecular Spectroscopy, Ohio State University, Columbus, OH

Sayeitkulov, Shuhrat Murodovich
Samarkand State University, Samarkand
221st American Chemical Society National Meeting, San Diego, CA

Torakulov, Yakhyo
Samarkand State University, Samarkand
56th Symposium on Molecular Spectroscopy, Ohio State University, Columbus, OH

Tukhvatullin, Farit
Department of Physics, Samarkand State University, Samarkand
56th Symposium on Molecular Spectroscopy, Ohio State University, Columbus, OH

Usmanov, Gayrat
Samarkand Cooperative Institute, Samarkand
Ocean Optics, Inc., Chicago, IL

Yarmuhamedov, Akmal
Samarkand State University, Samarkand
Gordon Research Conference on Condensed Matter Physics, Connecticut College, Hartford, CT

Zinoviev, Alexander Viktorovich
NPO Akadempribor, UzAS
Arizona State University, Tempe, AZ

Partnerships in Technology

Arapbay Maripov, an expert in holograms from the Kyrgyz Technical University, participated in SPIE's International Symposium on Optical Science and Technology in San Diego, CA. There, he met with Engineering Synthesis Design Corporation (ESD) to discuss a potential application to the Next Steps to the Market program. Dr. Maripov reported that representatives from other companies also expressed interest in his research.

LEFT Arapbay Maripov

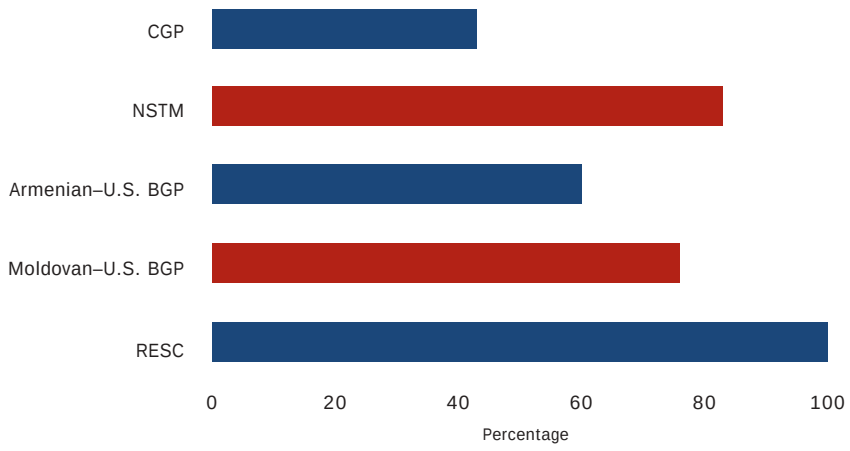
Stopping the Spread of Weapons of Mass Destruction

One of the CRDF's primary goals is to engage former Soviet weapons researchers in civilian activities. Since the CRDF's inception in 1995, its various cooperative grants programs and other activities have helped over 1,000 scientists with biological, chemical, nuclear, and other weapons experience to transition toward civilian research. Figure 6 illustrates the percentage of awards involving former weapons researchers under selected CRDF programs.

In 2001 the CRDF established a Nonproliferation Programs (NP) Office, intended to maximize the nonproliferation impact of its programs. The NP Office identifies and coordinates new cross-cutting CRDF initiatives with potential nonproliferation impact; manages the CRDF's direct support to U.S. Government nonproliferation programs; serves as a liaison with those programs to avoid overlap and duplication of effort; and takes steps to ensure that CRDF-funded activities do not in themselves pose a proliferation risk.

In 2002 the CRDF plans to open several targeted competitions to engage scientists with weapons of mass destruction expertise in civilian research.

FIGURE 6: Awards Engaging Former Weapons Researchers (selected 2001 programs)



ANTI-TERRORISM RESEARCH COMPETITION

The NP Office is coordinating the CRDF's Special Competition for Research on Minimizing the Effects of Terrorist Acts on Civilian Populations, announced in December 2001. The competition will offer support to teams of U.S. and FSU scientists, engineers, and researchers looking for innovative technological solutions to the problem highlighted so dramatically by the events of September 11, 2001.

The competition will fund joint U.S.-FSU workshops to identify research priorities relevant to minimizing terrorist threats, followed by a grants competition. American and FSU researchers will combine their understanding of science and technology and their experience on topics associated with weapons of mass destruction to suggest research proposals for innovative solutions aimed at neutralizing such threats.

In launching the competition, the CRDF is drawing on its extensive experience working with scientists from the FSU to address scientific and technical issues of mutual concern. In particular, the CRDF hopes for participation by scientists who have an understanding of the science and technology associated with weapons of mass destruction, including biological, chemical, and nuclear weapons. The urgent requirement to protect civilian populations from terrorist acts will provide those scientists with an unprecedented opportunity to apply their knowledge and skills to international security and safety.

The Special Competition for Research on Minimizing the Effects of Terrorist Acts on Civilian Populations has received initial funding from the U.S. Department of State as part of a coordinated response to reduce the threat of terrorism and the proliferation of weapons of mass destruction.

Eradicating Smallpox

The CRDF is facilitating implementation of three smallpox-related projects sponsored by the Defense Threat Reduction Agency (DTRA) and the Department of Health and Human Services Biotechnology Engagement Program. These projects, sanctioned by the World Health Organization, team scientists from the Collaborating Center for Smallpox and Other Poxvirus Infections at the Center for Disease Control and Prevention with their Russian counterparts at the State Research Center for Virology and Biotechnology. The projects will develop antibody libraries for the treatment of smallpox; sequence several strains of smallpox virus to better understand its structure; and search for antivirals for the treatment and prevention of the infection.

CRDF staff served as the liaison between DTRA and the multiple organization effort required to conduct this research. If successful, the projects will make significant contributions to scientific knowledge and to the prevention of smallpox.

Closed Cities Program

In 2001 the CRDF phased out its Closed Cities program. The program provided travel support and proposal development grants for U.S. researchers who were engaged or seeking to be engaged in collaboration with scientists in Russia's closed cities—large previously secret technical facilities for research on, and production of, weapons of mass destruction. The CRDF has determined that support for such visits is now available through other CRDF and U.S. Government programs.

DIRECT SUPPORT OF U.S. GOVERNMENT NONPROLIFERATION EFFORTS

Cooperative Biodefense Research Program

In June 2001 DTRA expanded its contract with the CRDF to continue support for the $57 million Cooperative Biodefense Research program. The program is intended to help prevent the proliferation of biological weapons and related scientific expertise from the FSU to other countries by engaging former Soviet biological weapons scientists on non-weapons research in collaboration with American experts.

Under the new contract, the CRDF provides project development, coordination, and management for projects funded by the DTRA program. These services include facilitating proposal development meetings and visits; coordinating proposal reviews; providing project management assistance; arranging training in the use of specialized equipment and lab procedures; organizing and funding the participation of U.S. technical expert collaborators; and planning and implementing monitoring activities. In 2001, under the Cooperative Biodefense Research Program, DTRA funded six new projects valued at $3.6 million. The projects employ 237 scientists at former Soviet biological weapons institutes.

SCIENCE CENTERS PROGRAM

Under a grant from the U.S. Department of State, the CRDF assists that agency in its role as manager of U.S. participation in the International Science and Technology Center (ISTC) in Russia and the Science and Technology Center (STCU) in Ukraine. Those multinational nonproliferation programs fund former Soviet weapons scientists to carry out civilian research.

Using its extensive reviewer database and Internet-based information resources, the CRDF identifies technical expert reviewers for project proposals submitted to the ISTC and STCU.

The CRDF also facilitates high priority visits to the United States by former Soviet weapons scientists and helps to arrange meetings with potential partners in the United States. These activities support the ISTC and STCU goal of providing weapons scientists in the FSU with opportunities to redirect their talents to peaceful research.

During 2001 the CRDF identified more than 1,200 technical experts to review proposals and also assisted with the visits of 17 former bioweapons researchers.

Special Effort to Engage Moldovan Former Defense Firms

At the request of the U.S. Department of State, and with the assistance of the Moldovan Research and Development Association, the CRDF embarked on an ambitious effort in Moldova to redirect firms, previously engaged in Soviet defense-related R&D, to civilian and commercial collaborations.

CRDF teams assessed the facilities and capabilities of ELIRI, TOPAZ and Mezon, all former Soviet defense electronics firms. The teams met with company managers to identify areas of technology and expertise that might serve as cornerstones for targeted redirection activities. In coordination with the U.S. and Moldovan Governments, the CRDF developed tailored programs designed to promote each Moldovan company's efforts to secure self-sustaining civilian work. As the next step to forming international collaborations, planned activities include participation, in 2002, in international tradeshows and conferences.

ABOVE Vladimir Policarpov, chief engineer of Perfuzon, a subsidiary of the Moldovan firm Mezon, explains his company's process for manufacturing intravenous solution plastics equipment

Centers and Institution Building

Strengthening Science and Technology Infrastructure in the FSU

The CRDF has a long-term strategic commitment to strengthen the institutional base of science in the countries of the former Soviet Union. Through its Centers and Institution Building programs, the CRDF strives to improve the scientific infrastructure of FSU countries by creating new sustainable institutions and by strengthening existing institutions.

These institution-building programs also further the objective of helping former Soviet weapons scientists make the transition to civilian research activities by providing additional and more accessible mechanisms for those researchers to participate in CRDF competitions.

In 2001 there was a major increase in funding to the Basic Research and Higher Education (BRHE) Program for support of scientific research and education at higher education institutions in Russia. Five new Regional Experimental Support Centers (RESC) awards were announced. The year also saw continued cooperative activities with the CRDF-created National Foundation of Science and Advanced Technologies of Armenia and the Moldovan Research and Development Association, as well as preliminary steps by the CRDF to establish a similar institution in Georgia.

BASIC RESEARCH AND HIGHER EDUCATION

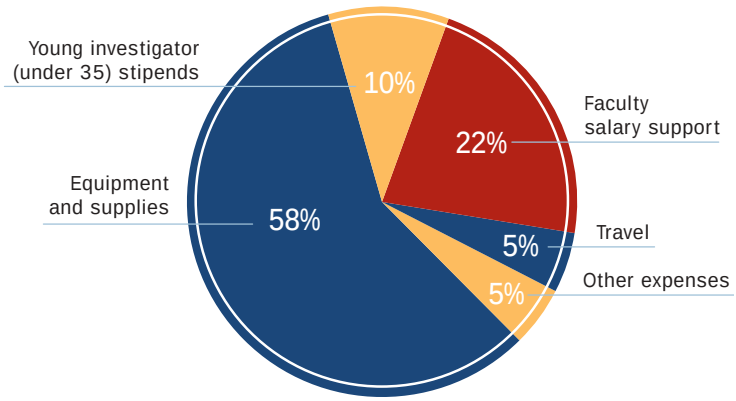
The BRHE program aims to help Russia improve its higher education infrastructure for scientific research by establishing high-quality Research and Education Centers (RECs) within Russian higher education institutions. The RECs, each of which receives grants of approximately $1 million over three years, are intended to attract top researchers and professors and to support innovative programs and approaches to combining research and education. The program encourages the centers to provide special opportunities for young investigators.

In early 2001 the CRDF received a major increase in funding for the BRHE program. The additional funds from the John D. and Catherine T. MacArthur Foundation, Carnegie Corporation of New York, and the Russian Ministry of Education marked the start of a new phase of the program to include not only two new competitions, but also an opportunity to issue performance-based continuation grants to the centers and to fund integrative activities to strengthen the REC network.

REC Funding Priorities

The three-year $1.05M BRHE grants are large enough to make a substantial difference in the conduct of basic science at a Research and Education Center. With few restrictions, RECs may allocate their grant monies freely among several budget categories. **Figure 7** illustrates how the RECs allocated their funds in 2001.

FIGURE 7: REC Budget Allocations



The CRDF and the Russian Ministry of Education, which jointly administer the program, launched a third BRHE competition in March 2001 and announced four awards in November 2001. The awards bring the total number of RECs to 12. (See awards list, p. 46, and map, page 45, for REC locations) The two organizations then announced a fourth competition in late 2001, through which they expect to fund four more centers in Russia by July 2002.

BRHE plans in 2002 call for expanding integrative activities to increase information exchange among the RECs and to improve their effectiveness in the international science arena. Priorities will be driven by the needs of the RECs, with guidance from the CRDF and the Russian Ministry of Education. Areas for attention include English language training for students, research management, a REC newsletter, and technology transfer.

Steps towards establishing these integrative activities began with a pan-REC roundtable discussion in Moscow in December 2001 and will continue at a pan-REC conference planned for April 2002.

RIGHT Announcement of the BRHE awards in Moscow: (left to right) Lauren Graham, Andrea Kalan, and Stuart Politi, CRDF; Tatiana Zhdanova and John Slocum, The John D. and Catherine T. MacArthur Foundation; Marilyn Pifer, CRDF; Yuri Shlenov and Mikhail Strikhanov, Russian Ministry of Education; Harley Balzer, Georgetown University; Loren Graham, Massachusetts Institute of Technology

BRHE GOVERNING COUNCIL

U.S. MEMBERS

Marjorie Senechal (Co-Chair), Smith College

Deana Arsenian, Carnegie Corporation of New York

Harley Balzer, Georgetown University

Loren Graham, Massachusetts Institute of Technology

Andrew Kuchins, Carnegie Endowment for International Peace

David Lee, Cornell University

Victor Rabinowitch, U.S. Civilian Research and Development Foundation

Roald Sagdeev, University of Maryland

Gerson Sher, U.S. Civilian Research and Development Foundation

John Slocum, The John D. and Catherine T. MacArthur Foundation

RUSSIAN MEMBERS

Vladimir Filippov (Co-Chair), Minister of Education of the Russian Federation

Yuri Shlenov, Ministry of Education of the Russian Federation

Boris Vinogradov, Ministry of Education of the Russian Federation

Mikhail Alfimov, Russian Foundation for Basic Research

Alexander Khokhlov, University of Nizhniy Novgorod

Alexander Kondakov, Prosveshchenie Publishing House

Gennady Kozlov, Ministry of Industry, Science and Technologies of the Russian Federation

Yuri Natochin, St. Petersburg State University

Nikolai Plate, Russian Academy of Sciences

Mikhail Strikhanov, Ministry of Education of the Russian Federation


BRHE Research and Education Center Sites
1. Nizhniy Novgorod (1998)
2. Krasnoyarsk (1999)
3. Vladivostok (1999)
4. Rostov, Taganrog, Krasnodar (three-way project, 1999)
5. Ekaterinburg (2000)
6. Saratov (2000)
7. Kazan (2000)
8. Novosibirsk (2000)
9. Perm (2001)
10. Voronezh (2001)
11. Moscow (2001)
12. St. Petersburg (2001)
Russian Federation

BRHE AWARDS 2001

Moscow State Engineering Physics Institute, Moscow Institute of Physics and Technology (joint award) *Research and Education Center for Basic Investigation of Matter Under Extreme Conditions*

A center focusing on the investigation and simulation of the behavior of matter under extreme pressure, phase transitions, and super-high energy conditions
Award Announced: November 2001
Director: Boris Y. Bogdanovich, Professor and Vice-Rector
Moscow State Engineering Physics Institute Rector: Boris N. Onyki
Moscow Institute of Physics and Technology Rector: Nikolay N. Koudriavtsev

Perm State University *Research and Education Center for Non-Equilibrium Transitions in Continuous Media*

A center located in central western Russia, investigating the evolution of opened nonlinear systems far from equilibrium
Award Announced: November 2001
Director: Valery P. Matveenko, Professor, Corresponding Member of Russian Academy of Sciences, Head of Applied Mechanics and Computer Technologies
University Rector: Vladimir V. Malanin

St. Petersburg State University *Research and Education Center on Molecular Biology for Human and Environmental Health in Northwest Russia*

A center focusing on the interactions of organisms in the biosphere and their effect on environmental and human health
Award Announced: November 2001
Director: Sergey G. Inge-Vechtomov, Professor, Corresponding Member of Russian Academy of Sciences, Head of Department of Genetics and Breeding
University Rector: Ludmila A. Verbitzkaya

Voronezh State University *Research and Education Center for Wave Processes in Inhomogeneous and Nonlinear Media* (in partnership with Moscow State Institute of Radio, Electronics and Automatics)

A center located in southwestern Russia, focusing on nonlinear dynamics of magneto-ordered media and ferroelectric structures
Award Announced: November 2001
Director: Alexander S. Sidorkin, Professor, Vice-President for Research
University Rector: Ivan I. Borisov
Partner University Rector: Alexander S. Sigov

BRHE Highlight

Ecological Conservation on Sakhalin Island

Prior to construction of a proposed gas and oil pipeline that will bridge the northern and southern parts of Sakhalin Island, including its seashore areas, the Marine Biota REC at Far Eastern State University (FESU) in Vladivostok performed environmental assessments for the Sakhalin Energy Investment Company. The study led to the identification of the flora and fauna put at greatest risk by the pipeline and recommendations that would reduce the pipeline's impact on the environment. As a further result of the collaboration, the Marine Biota REC has developed a new discipline at the FESU, "Oil and Coal Chemistry."

ABOVE Members of the Marine Biota REC research team (left to right) Michail Kornienko, Marisa G. Kasichanova, Olga Dolgova, Dmitriy Lomashin, and Tatyana Savko

REGIONAL EXPERIMENTAL SUPPORT CENTERS

The CRDF's Regional Experimental Support Centers (RESC) program provides major state-of-the-art scientific equipment and related training to civilian research institutions in the FSU. Institutions receiving RESC awards are expected to serve as regional centers, sharing the equipment on an equitable basis with educational, scientific, and industrial users.

The program's long-term goal is for the individual RESCs to become financially sustainable institutions that support world-class scientific research and underpin technological development in the region. Institutions are selected competitively through a merit-based review process, in which the CRDF coordinates with its counterpart in each country.

RESC centers also support the transition of weapons scientists to civilian research by providing them with the opportunity to participate in civilian research projects utilizing state-of-the-art equipment not otherwise available in the region.

Instrumentation Most Frequently Purchased with RESC Award Funds

- Scanning electron microscope
- X-ray diffractometers

  Used to investigate structures at the sub-micron and molecular levels.

- Gas chromatographs
- Spectrometers

  Used to determine the purity and composition of materials and mixtures.

In 2001 the CRDF announced two RESC awards in Georgia, two in Moldova, and one in Khabarovsk in the Russian Far East, averaging $315,000 each. (See awards list, p. 48) The CRDF also opened up the RESC program to Azerbaijan and will announce new awards there in 2002. Two more RESC competitions are planned for 2002, and an award in Uzbekistan is anticipated.

Funding for the RESC program is provided by the U.S. Department of State. The Ministry of Industry, Science and Technologies of the Russian Federation and the Khabarovsk Regional Administration have agreed to cost share on the award in Khabarovsk.

RESC AWARDS 2001

GEORGIA

Georgian Technical University; Center for Medical Polymers and Biomaterials
Ramaz Katsarava, Project Director
Equipment: FTIR spectrophotometer and UV-VIS spectrophotometer, differential scanning calorimeter, gel-penetration chromatograph, centrifuge, polarimeter
The equipment will be used to create new biodegradable highly biocompatible polymers composed of naturally occurring and non-toxic building blocks. The polymers will be used in wound dressing biocomposite film materials that contain bacteriophages and have high wound healing potential.

Eliava Institute of Bacteriophage, Microbiology and Virology; Regional Experimental Center for Applied Microbiology and Bacteriophage
Nina Chanishvili, Project Director
Equipment: bacteriophage-specific equipment to reinforce existing laboratory, including a freeze-dry system and a centrifuge
The equipment will update methods of phage production to help biopharmaceutical and dairy companies in the Georgian region.

MOLDOVA

Technical University of Moldova; National Center for Materials Study and Testing in Mechanics, Opto-Microelectronics and Non-Conventional Energetics
Ion Tiginyanu, Project Director
Equipment: scanning electron microscope
The equipment will be used in fundamental and applied research in nanostructured semiconductors, nanocomposites, powdery and plastic materials to develop new engineering materials. Laboratory courses on scanning probe microscopy for senior students are also planned.

Plant Physiology Institute of the Academy of Sciences of Moldova; Center of Advanced Biological Technologies
Alexandru Dascaliuc, Project Director
Equipment: Agilen 1100 Series LC/MSD Trap System
The equipment will be used to conduct crop research, to explore the potential medicinal applications of plants, and to help train the next generation of molecular biologists.

RUSSIA

Far Eastern Branch of Russian Academy of Sciences; Institute of Tectonics and Geophysics
Leonid F. Mishin, Project Director
Equipment: ICP-MS Elan6100 DRC mass spectrometer
The equipment will be used to conduct geological and ecological studies in the Russian Far East. Studies will include determining gas and oil composition and mineral structure.

RESC Spotlight

Advancing Cancer Therapy Research

Using an NMR spectrometer funded through the Regional Experimental Support Centers program in 1998, researchers at the Laboratory of Ecology and NMR Group of the Kavetsky Institute of Experimental Pathology, Oncology and Radiobiology, UAS, are studying the structure of new chemical substances with potential applications in conventional cancer therapy. The researchers have recorded their results in several FSU publications and presented their work at international conferences, including the 2001 British Cancer Research Meeting.

The laboratory is also fulfilling RESC requirements, offering the research community at large access to the equipment and underpinning regional technological development. Regional guest users of the NMR equipment include the Research Institute of Oncology of the Academy of Medical Sciences and Enamin, Ltd. Furthermore, the facility has partnerships with the United Kingdom's Gray Research Institute and the Division of Biochemical Toxicology, National Center for Toxicological Research in Arizona. Researchers have also organized several events around the NMR equipment, including training courses for students from Kyiv National University.

Center for Medicinal Herbs and Forensic Research

The Gulbenkian Research and DQCL Laboratories of the Drug and Medical Technology Agency, in existence since 1998, is an international and domestic focal point for research on new synthetic compounds and medicinal herbs. The facility has entered into a collaboration with the Swedish Herbal Institute and trains postgraduates and postdocs from higher education institutions, including Yerevan Medical University and the Institute of National Economy.

LEFT Victor M. Mikhailenko, Director, Laboratory of Ecology and NMR Group of the Kavetsky Institute of Experimental Pathology, Oncology and Radiobiology
RIGHT Alexander Panossian, Director of the Gulbenkian Research and DQCL Laboratories (left), and colleague

The laboratories also maintain a database of 600,000 chemical compounds that has aided Armenian authorities in the detection of controlled substances.

Other services performed by the Gulbenkian Research and DQCL Laboratories include food and nonalcoholic beverage analysis for clients in Armenia and in other former Soviet countries, as well as drug testing for athletic competitions.

INSTITUTION BUILDING

The CRDF also promotes its goal of strengthening the scientific base in the FSU by establishing and supporting new sustainable institutions that promote competitive merit-reviewed scientific and technological research.

Through its institution-building activities, the CRDF helped to create new science-funding organizations in Armenia and Moldova and is working closely with both to develop and implement science and technology building activities. The CRDF expanded its institution-building activities in 2001 to the Republic of Georgia, where it helped to establish another grant-making science foundation.

The National Foundation of Science and Advanced Technologies

The National Foundation of Science and Advanced Technologies (NFSAT) in Armenia continued its activities in the areas of research grants, training seminars, and related activities. Modeled on Western science-funding agencies, the NFSAT was established by the CRDF and the Government of Armenia in 1997 as an independent Armenian organization. Its goal is to help promote scientific research and technological development on a competitive basis.

In 2001 the NFSAT held an Armenian-U.S. Bilateral Grants Program (BGP) competition, the second of its kind, under which it awarded five grants. (See awards list, p. 51) These awards bring the total number of NFSAT-CRDF bilateral grants to 15. The NFSAT announced a third BGP competition in October 2001.

The NFSAT also unilaterally launched an Experimental Instrumentation for Scientific Infrastructure (EISI) program and announced two awards in August. (See awards list, p. 51) Through this program, the NFSAT is sponsoring the purchase of scientific equipment for Armenian institutions on a competitive basis. Modeled on the CRDF's own RESC grants, the EISI awards hold a special significance in that they are, to date, the largest grants made by the NFSAT. They are also the first issued under a competition in which the NFSAT performed an independent review and was solely responsible for the implementation process. Under EISI, the NFSAT will also purchase licensed software packages and will provide core funding to an information center serving the Armenian scientific community. The primary selection criteria for the program will be demonstrable impact on the broader scientific community and on the Armenian economy.

Reforestation and Alternative Energy Resources

Supported by a grant under the second Armenian-U.S. Bilateral Grants Program, Gagik Movsesian of the Institute of Botany, AAS, and Vashek Cervinka of the California Department of Water Resources are researching poplar trees and hybrids with high energy content. The scientists are evaluating the energy capacities and wood yield potential of fast-growing poplar trees as a promising remedy for some of Armenia's heavily deforested regions. The researchers also hope to increase interest in cultivating poplars among Armenians. Their work supports Armenia's national objective to address the problem of depleted energy reserves by researching and developing renewable energy resources.

ABOVE Gagik Movsesian monitoring the growth of test poplar trees

ABOVE Participants of the October 2001 proposal-writing seminar held in Yerevan

The CRDF and the NFSAT held a proposal-writing seminar in Yerevan in October, similar to a workshop held in 1999. Approximately 160 scientists, representing about 50 Armenian institutions attended the three-day event. Many of the scientists are expected to apply to the CRDF and to other funding organizations for research support in 2002.

As the NFSAT looks to 2002, it is preparing to celebrate its fifth anniversary. A new grant from the CRDF will allow the NFSAT to implement a third bilateral grants program; offer short-term travel grants; establish fiber optics links for competitively selected scientific institutions throughout Armenia; and support several regional conferences to address problems of common interest to the countries of the South Caucasus.

ARMENIAN-U.S. BILATERAL GRANTS PROGRAM—2001 AWARDS

(Listed alphabetically by Armenian principal investigator)

Kokanyan, Edvard Pier, Institute of Physical Research, AAS, Ashtarak
Gruber, John Balsbaugh, San Jose State University
Development of Low Excitation Threshold Active Medium for Compact Solid State Lasers

Mantashyan, Adolf A., Institute of Chemical Physics, AAS, Yerevan
Wang, Hai, University of Delaware
Radical-Chain Reactions for the Solution of Environmental Problems. Utilization of the SO2 Pollutant

Movsesian, Gagik Gurgen, Institute of Botany, AAS, Yerevan
Cervinka, Vashek, California Department of Water Resources
Wood Biomass of Fast Growing Poplar Plantations as an Alternative Source of Energy

Nersesyan, Anri, Institute of Mathematics, AAS, Yerevan
Marichev, Oleg, Wolfram Research, Inc.
Elaboration of Fast Algorithms for MATHEMATICA Technical Computing System

Poghosyan, Armen Rafikovitch, Institute of Physical Research, AAS, Ashtarak
Guo, Ruyan, Pennsylvania State University
Production of Periodically Poled Lithium Niobate Crystals during Growth Process and Study of Poling Mechanisms

NFSAT EXPERIMENTAL INSTRUMENTATION FOR SCIENTIFIC INFRASTRUCTURE 2001 AWARDS

National Academy of Sciences of Armenia; Center of Medical Genetics
Susanna Midyan, Project Director
Equipment: Nikon-Leica cytogenetic workstation
The equipment will analyze abnormal chromosomes in prenatal and postnatal patients. The workstation will replace traditional methods of karyotype and cytogenetics research and offer researchers a wide range of imaging technologies to quickly and efficiently detect and diagnose genetic abnormalities. The center will also make the equipment available to researchers in cancer genetics and other fields.

Institute of Chemical Physics of the National Academy of Sciences of Armenia; Electro-Chemical Analysis Center
Levon Tavadyan, Project Director
Equipment: BAS 100B/W electrochemical workstation
The center will use the equipment for basic and applied research on metallurgical and bioactive compounds, to train young scientists, and to expand collaborative programs with local and foreign scientists.

The Moldovan Research and Development Association (MRDA)

The Moldovan Research and Development Association (MRDA) celebrated its first anniversary in 2001. Modeled after the successful NFSAT in Armenia, the organization's goals are to strengthen Moldova's science and technology infrastructure; to prepare the country's scientists for the free market; and to bring together Moldovan and U.S. scientists on research projects.

The MRDA hosted several seminars designed to help Moldovan researchers better compete in the international scientific community. Over 130 scientists from 48 Moldovan universities and institutes attended a proposal-writing seminar in January. In March over 40 scientists attended a commercialization seminar on the business and legal processes of bringing new technologies to the market.

In May the MRDA and the CRDF announced 29 awards under the first Moldovan-U.S. Bilateral Grants Program (BGP) competition. (See awards list, p. 54) Developed in tandem by the CRDF and MRDA, the Moldovan-U.S. BGP provides support to joint teams for 18-month projects in all areas of basic and applied research.

The MRDA's efforts to publicize the competition, coupled with the seminars it hosted in 2000 and 2001, resulted in an impressive increase in the number of proposals submitted by Moldovan scientists. Whereas between 1995 and 2000, Moldovan researchers submitted only 10 applications to all CRDF competitions, the first Moldovan-U.S. BGP attracted 64 proposals. Those proposals underwent a rigorous merit review. Special consideration was given to those that included the participation of former defense scientists. The MRDA's Moldovan-U.S. BGP review process, which mirrored that of the CRDF, gave MRDA staff valuable proposal management experience.

The MRDA looks forward in 2002 to continuing its training activities and to announcing a second Moldovan-U.S. BGP competition.

Georgian Research and Development Foundation (GRDF)

Following the successful models in Armenia and Moldova, the CRDF and the Department of Science and Technology of the Government of Georgia took the first steps toward establishing a Georgian Research and Development Foundation (GRDF). The Tbilisi-based foundation will be an independent nonprofit organization that will promote scientific research and technological development in Georgia. The CRDF expects the GRDF to become operational in 2002, at which time the two organizations will begin conducting a series of training activities and grant competitions.

Institution Building in 2002

Looking ahead to 2002, the NFSAT, MRDA, and GRDF each have a full roster of activities. In addition, the CRDF anticipates initiating multilateral activities to bring together representatives from all three organizations so that they may benefit from one another's experiences. The CRDF will discuss with counterparts in Azerbaijan the possibility of establishing a similar organization in that country.

International Geodynamics Research Center of Kyrgyzstan and the Kyrgyz Seismic Network

The CRDF continued its support of the International Geodynamics Research Center (IGRC) in 2001. The IGRC provides a central location for the international scientific community to conduct research on the geodynamics of the nearby Tien Shan mountain range. The center also supports the maintenance and repair of the Kyrgyz Seismic Network (KNET). A ten-station regional seismic network, KNET allows researchers to gather real-time data on naturally occurring and man-made seismic activities in the region. The Integrated Research Institutions for Seismology (IRIS) provided additional funding for the network. IRIS, a U.S. consortium of university-based seismologists, pools resources to maintain seismic stations, such as the KNET, around the world.

International Biogeochemistry Center in Kamchatka

In October 2001 the CRDF funded a conference to evaluate the possibility of establishing an international interdisciplinary biogeochemical research center in Kamchatka. The Kamchatka peninsula in Russia has many unique geological features not found elsewhere in the world, in particular, the presence of extremophilic and thermophilic microorganisms. Those microorganisms are of interest to modern fields of biogeochemistry and could have future pharmaceutical potential.

Current facilities in Kamchatka are out-of-date, and many scientists have raised the possibility of developing an international research center on a new or existing site to begin research on the peninsula's microorganisms. The conference resulted in the development of three proposals that were submitted to funding organizations to provide support for the first steps toward establishing a research center in Kamchatka.

The conference was held at Yellowstone National Park in Wyoming because of geological similarities between Yellowstone and Kamchatka.

MOLDOVAN-U.S. BILATERAL GRANTS PROGRAM—2001 AWARDS

(Listed alphabetically by Moldovan principal investigator)

Andries, Andrei Mihail, Institute of Applied Physics, ASM, Chisinau
Ersoy, Okan K., Purdue University
Development of a Novel Technical Approach to the Formation of Anti-Counterfeiting Hologram Stickers (Security Holographic Marks) on the Base of Combined Optical and E-Beam Lithography

Bogdevich, Oleg Petru, Institute of Geophysics and Geology, ASM, Chisinau
Hannigan, Robyn Ellen, Arkansas State University
Environmental Risk Assessment of Toxic Element Pollution in Agricultural Regions of Moldova and Arkansas

Bostan, Ion Anton, Technical University of Moldova, Chisinau
Rivin, Evgeny I., Wayne State University
The Elaboration and Research of Cinematic Planetary Precessional Transmissions

Casian, Anatolie Iradion, Technical University of Moldova, Chisinau
Balandin, Alexander A., University of California, Riverside
Investigation of Electronic Thermal Conductivity in Low-Dimensional High Performance Thermoelectric Structures

Chicu, Valeriu Tudor, Nicolae Testemitanu State Medical and Pharmaceutical University, Chisinau
Jacobs, Robert Raymond, Eastern Virginia Medical School
Developmental Program for Evaluation and Assessment of Indoor Air

Ceban, David Nicolae, Moldova State University, Chisinau
Duan, Jinqiao, Illinois Institute of Technology
Asymptotic Behavior of Nonautonomous Dynamical Systems with Applications in Hydrodynamics, Meteorology and Oceanology

Culiuc, Leonid L., Institute of Applied Physics, ASM, Chisinau
Ramananthan, Kannan, National Center for Photovoltaics, NREL
Development of Photovoltaic Cell Technology on the Basis of Cu(InGa)Se2 Thin Layers

Gasin, Petru Alexei, Moldova State University, Chisinau
Sites, James R., Colorado State University
Development of New Techniques of CdS-CdTe Solar Cell Enhancement

Gonta, Maria Vasile, Moldova State University, Chisinau
Mirvish, Sidney Solomon, University of Nebraska Medical Center
The Inhibition of Carcinogenic N-Nitroso Compounds Formation in Simulated Gastric Juice

Gudima, Konstantin Kiril, Institute of Applied Physics, ASM, Chisinau
Sierk, Arnold John, Los Alamos National Laboratory
Development of a Universal Intranuclear Cascade Type Model for Heavy Ion and Nucleon Induced Reactions at Intermediate Energies

Iovu, Mihail S., Institute of Applied Physics, ASM, Chisinau
Boolchand, Punit, University of Cincinnati
Rare-Earth Dopant Additives and Photo-Structural Transformations in Chalcogenide Glasses

Izbas, Vladimir Ion, Institute of Mathematics and Computer Science, ASM, Chisinau
Mullen, Gary L., Pennsylvania State University
New Check Character Systems Using Quasigroups

Korotcenkov, Ghenadii, Technical University of Moldova, Chisinau
Schwank, Johannes, University of Michigan
Advanced Multi-Component SnO2-Based Nano-Scaled Metal Oxide Films for Gas Sensor Applications

Lozovanu, Dimitru, Institute of Mathematics and Computer Science, ASM, Chisinau
Zelikovsky, Aleksandr Zinovyevich, Georgia State University
Algorithms for Solving Optimization Problems on Networks

Macaev, Fliur Zainutdin, Institute of Chemistry, ASM, Chisinau
Reynolds, Robert Craig, Southern Research Institute
Synthesis and Bioactivity of New Heterocyclic Compounds from Hydrazides of Aminobenzoic Acids

Moskalenko, Sveatoslav Anatolievich, Institute of Applied Physics, ASM, Chisinau
Snoke, David, University of Pittsburgh
Excitons and Electron-Hole Pairs Interacting with Laser and Magnetic Fields in Semiconductors of Different Dimensionalities

Nikolaeva, Albina Alexandrovna, Institute of Applied Physics, ASM, Chisinau
Huber, Tito E., Howard University
Synthesis of Nanostructures Based on Bi and Bi-Sb and the Investigation of Electronic Transport over a Wide Range of Temperatures, Magnetic Fields and Deformations

Ogurtsov, Ivan Iacov, Institute of Chemistry, ASM, Chisinau
Bersuker, Isaac B., University of Texas, Austin
Dioxygen Activation by Transition Metal Coordination Compounds

Oleschuk, Valentin, Research Institute for Power Engineering, ASM, Chisinau
Bose, Bimal K., University of Tennessee
Power Electronic Converters with Digital Synchronous Algebraic Modulation Combined with Artificial Intelligence Tools for Energy Saving Adjustable Electric Drive for Agricultural, Industrial and Municipal Utilization

Rotar, Vasile, Moldova State University, Chisinau
Kukhtarev, Nickolai, Alabama A&M University
Development of a New Approach for Applications of Relief-Phase Photo-Recording Media in Holography

Sibirschi, Victor Konstantin, Institute of Mathematics and Computer Science, ASM, Chisinau Youngen, Gregory K., University of Illinois, Urbana-Champaign
Creation of Scientific Publications Database for Moldovan Researchers

Simonov, Iurie, Institute of Applied Physics, ASM, Chisinau
Zaworotko, Michael J., University of South Florida
Synthesis, X- Ray Study and Inclusion Properties of Crown-Based Extended Networks

Tiginyanu, Ion Mihai, Technical University of Moldova, Chisinau
Pavlidis, Dimitris, University of Michigan
Phonon Engineering in III-V Nitrides for Device Applications

Timco, Grigore Andrei, Institute of Chemistry, ASM, Chisinau
Christou, George, University of Florida
Synthesis and Applications of New Homo- and Heteropolynuclear Metal Cluster Compounds

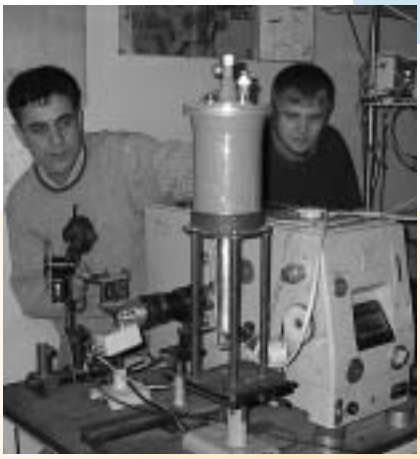
Todirash, Vladimir Alexei, Institute of Plant Protection, Chisinau
Rajotte, Edwin George, Pennsylvania State University
Development of a Decision Support System for Orchard Integrated Pest Management

Tsukerblat, Boris Samuil, Institute of Applied Physics, ASM, Chisinau
Dunbar, Kim Renee, Texas A&M University
Theoretical and Experimental Study of Exchange and Double Exchange Interactions in Molecule-Based Magnetic Materials, Study of Magnetic Clusters Containing Transition Metal Ions with Unquenched Orbital Angular Momenta

Ungureanu, Laurentia Nicolaievna, Institute of Zoology, ASM, Chisinau
Schlenk, Daniel, University of California, Riverside
Research on the Current Status of Biodiversity and Water Quality in the Dniester River

Vaintraub, Iosif Alexandrovich, Moldova State University, Chisinau
Wilson, Karl A., Binghamton University
Storage Protein Mobilization in Germinating Legume Seeds: Enzyme Machinery and Regulation

Volosciuc, Leonid T., Institute of Plant Protection, Chisinau
Hammock, Bruce D., University of California, Davis
Baculoviral Preparations for Environment Protection in Sustainable Agriculture



TOP LEFT Maria V. Gonta (standing) with team member V. Iambarteva TOP RIGHT Oleg P. Bogdevich BOTTOM Maslov Veniamin (left) and Iurii Apostolov, members of Leonid Culiuc's research group

Grant Assistance Program

Facilitating Scientific and Educational Cooperation with the FSU

The CRDF's Grant Assistance Program makes available the foundation's financial grant management infrastructure to universities, government agencies, for-profit companies, and other organizations. GAP offers funds and materials transfer and project administration services to organizations conducting pre-commercial R&D activities in the FSU that are consistent with the CRDF's mission.

The Grant Assistance Program (GAP) is an outgrowth of the CRDF's own mechanism to administer its projects and activities in the FSU. GAP has helped a significant number of organizations establish viable R&D relationships with FSU researchers and institutions in a manner that provides a high degree of accountability and reliability.

By 2001 GAP had helped over 120 organizations provide support to collaborative research and educational activities engaging more than 5,000 FSU participants. In 2001 GAP successfully transferred over $14 million in funds on behalf of program participants carrying out projects in the former Soviet Union, bringing the total amount of funds transferred to date to over $29 million. (See list of FSU institutions that have received support via GAP, p. 60)

The renewal rate for GAP clients—the percentage of existing GAP participants who renewed projects or submitted new applications in 2001—approached 80 percent. New program participants in 2001 included Shell International Exploration and Production B.V., Emory University, the Atlantic Oceanographic and Meteorological Laboratory/NOAA, and Boston U.S. Medical Center. (See GAP participants list for a complete listing of organizations that have participated in or are currently participating in the program, p. 58)

Examples of projects that GAP participant organizations have underway in the FSU include epidemiological research on tuberculosis, HIV, and other infectious diseases; materials research; development of new technologies for fossil fuel exploration; bioadhesives research; environmental and conservation education and research activities; geophysical research; and student and young scientist support programs.

The year 2001 also marked the launch of the GAP Application Web Site, through which prospective program participants can submit applications. Based on the CGP's electronic proposal submission system, the GAP Application Web Site has shortened the application process and reduced the required paperwork. Further development of the site is planned for early 2002 and will include features such as electronic payment request submission and web-based financial reporting.

GAP at Work

Through its services, GAP supports U.S. Government nonproliferation objectives by providing opportunities for the U.S. Government and other organizations to engage former weapons researchers in civilian activities of mutual benefit to the United States and to the FSU. The CRDF's partnership with the Department of Energy (DOE) Initiatives for Proliferation Prevention (IPP) illustrates GAP's role in the redirection of former weapons scientists. Since November 1999 GAP has assisted the 11 DOE laboratories and facilities and the IPP program office by administering tax-free payments for over 150 projects in Russia and Ukraine, involving more than 3,000 FSU participants.

U.S Grant Assistance Program Participants

U.S. GOVERNMENT AGENCIES

European Office of Aerospace Research and Development,
  Air Force Office of Scientific Research
National Institute of Standards and Technology
National Oceanic and Atmospheric Administration
  Atlantic Oceanographic and Meteorological Laboratory
  Environmental Technology Laboratory
  Geophysical Fluid Dynamics Laboratory
  National Climatic Data Center
  Office of Global Programs
U.S. Department of Energy
U.S. Department of Energy National Laboratories
  Argonne National Laboratory
  Brookhaven National Laboratory
  Idaho National Engineering and Environmental Laboratory
  Kansas City Plant
  Lawrence Berkeley National Laboratory
  Lawrence Livermore National Laboratory
  Los Alamos National Laboratory
  National Energy Technology Laboratory
  National Renewable Energy Laboratory
  Oak Ridge Site
  Pacific Northwest National Laboratory
  Princeton Plasma Physics Laboratory
  Sandia National Laboratories
U.S. Department of Health and Human Services
  Agency for Healthcare Research and Quality
  Centers for Disease Control and Prevention
  National Center for Health Statistics
  National Institutes of Health
    National Cancer Institute
    National Institute on Alcohol Abuse and Alcoholism
    National Institute of Allergy and Infectious Diseases
    National Institute of Child Health and Human Development
  Office of International and Refugee Health
U.S. Department of the Interior
  U.S. Fish and Wildlife Service
  U.S. Forestry Service
U.S. Environmental Protection Agency Office of Air and Radiation
U.S. Geological Survey
U.S. Navy
  Naval Research Laboratory
  Office of Naval Research

INDUSTRY

3M
Aquila Technologies Group, Inc.
Biomedical Sciences Research Laboratories, Inc.
Compaq Computer Corporation
Conoco, Inc.
Converting Systems, Inc.
Corium International, Inc.
Dupont Agricultural and Nutrition
Dupont International
Glaxo Wellcome Experimental Research, SA
Icon Genetics, Inc.
Ionwerks, Inc.
MagiQ Technologies
OnPower Battery
Schlumberger Limited
Shell International Exploration and Production, B.V.
Syntroleum Corporation

EDUCATIONAL INSTITUTIONS

Boston College Institute for Scientific Research
California Institute of Technology
Clemson University
Cornell University
Dibner Institute for the History of Science and Technology
Emory University
Johns Hopkins University Center for Nondestructive Evaluation
Knox Grammar School (Australia)
Massachusetts Institute of Technology
Medical College of Wisconsin, Center for AIDS Intervention Research
Medical University of South Carolina
Mount Sinai School of Medicine
Northwestern University
Oak Ridge Institute for Science and Education
Politechnico di Bari (Italy)
Ravenswood School for Girls (Australia)
Research Foundation of the State University of New York
Texas A&M University
Texas Tech University
University of Alabama, Birmingham
University of Alaska, Fairbanks
University of Arizona
University of California, Berkeley
University of California, Los Angeles
University of Cincinnati
University of Geneva (Switzerland)
University of Houston
University of Illinois, Urbana Champaign
University of Kentucky Research Foundation
University of Massachusetts, Amherst
University of Minnesota
University of Nebraska
University of North Carolina, Chapel Hill
University of Oregon
University of Pennsylvania
University of Pittsburgh
University of Queensland, Pyrometallurgy Research Center (Australia)
University of Washington
University of Wisconsin, Madison
Uppsala University, Svedberg Laboratory (Sweden)
Washington University
Yale University School of Medicine

PRIVATE FOUNDATIONS, RESEARCH INSTITUTES, PROFESSIONAL SOCIETIES, AND NONPROFIT ORGANIZATIONS

Acoustical Society of America
American Geophysical Union
Associated Universities, Inc., National Radio Astronomy Observatory
Bavarian Research Center for Knowledge-Based Systems (Germany)
Boston Medical Center
Bridgeport Hospital
Cancer Research Institute
Danish Space Research Institute (Denmark)
Fox Chase Cancer Center
Fred Hutchinson Cancer Research Center
Home-Start International
Howard Hughes Medical Institute
Institut Francais du Petrole (France)
International Consortium for Research on the Health Effects of Radiation
International Union of Geodesy and Geophysics Commission on Geophysical Risk and Sustainability (Australia)
Joint Oceanographic Institutions
Juvenile Diabetes Research Foundation International
Ludwig Center for Cancer Research (Switzerland)
Missouri Botanical Garden
Paleontological Society
Research Triangle Institute
Roswell Park Cancer Center
Spencer Foundation
Stanley Foundation
World Wildlife Fund

RIGHT Irina Nasimova, a Moscow State University Ph.D. candidate in physics sponsored by Schlumberger Limited

GAP Participant Highlights

Industry and the Next Generation of Scientists

Schlumberger Limited, a global technology services company headquartered in Paris, New York, and The Hague, has been a program client since 1999. Schlumberger Limited supports student initiatives and funds collaborative precommercial R&D projects with Russian institutions, including the Moscow Engineering Physics Institute; the Keldysh Institute of Applied Mathematics; and the Institute of Geology of Ore Deposits, Petrography, Mineralogy, and Geochemistry.

The collaborations span numerous technology areas including acoustics, new sensor technologies, and mathematical modeling. GAP has provided Schlumberger Limited with a successful financial management mechanism to support projects, several of which have resulted in ongoing multiyear funding for the partner institutions.

Schlumberger Limited continues to use the CRDF's GAP services to support cooperative R&D efforts with FSU researchers, providing the scientists and their institutions with valuable funding and equipment, important contacts within the industrial R&D community, and experience in commercially oriented R&D.

Schlumberger Technology Corporation, a group of Schlumberger Limited, also currently uses GAP to facilitate two programs aimed at supporting FSU students. One program targets a specific educational institution, the Moscow Physical Technical University. Its goal is to encourage students from that institution to consider careers in industrial research through an outreach program that includes stipend incentives, visits to Schlumberger facilities, and work on M.Sc. project topics of industrial relevance. The second program is Russia-wide. It encourages young people to pursue careers in the sciences by providing grants to doctoral candidates to enable them to concentrate on their scientific work during those crucial three years of Ph.D. preparation.

FSU Grant Assistance Program Recipients

ARMENIA

Institute for Physics Research, AAS

GEORGIA

Eliava Institute of Bacteriophage, Microbiology and Virology

RUSSIA

Academy of Forestry
All-Russian Institute for Light Alloys
All-Russian Research Institute of Experimental Physics (VNIIEF)
All-Russian Research Institute of Hydrometeorological Information
All-Russian Research Institute of Phytopathology
All-Russian Research Institute of Technical Physics (VNIITF)
All-Russian Scientific Research and Development Institute of Industrial Technology
AOZT Finn-Trade
Arctic and Antarctic Research Institute
Association of Education Programs in Health Administration (AEPHA)
Baby Home #13 (St. Petersburg)
Baranov Institute of Aviation Motors
Belozersky Institute of Physico-Chemical Biology
Biomedical Center on AIDS
Biophysical Laboratory (Biofil, Ltd.)
Bochvar All-Russian Scientific Research Institute of Inorganic Materials (VNIINM)
Bolshekhekhtsirsky Nature Reserve
Botchinsky State Nature Reserve
Budker Institute of Nuclear Problems
Cancer Research Center, RAMS
Cancer Research Institute of Carcinogenesis
Cardiology Research Center, RAMS
Center for Ecological Research and BioResources Development
Center for International Projects
Center of Photochemistry, RAS
Central Astronomical Observatory at Pulkovo
Central Dokuchaev Soil Museum
Central Federal Research Institute for Skin and Venereal Disease
Central Public Health Research Institute
Ministry of Health, Tula Oblast
Regional Medical Informatics Center
Sverdlovsk Regional Bureau of Forensic Medical Examination
Central TB Research Institute, Moscow
Chemical-Pharmaceutical Research Institute
Chepetsky Mechanical Plant
Computing Center, Academgorodok, Krasnoyarsk
Design and Technological Institute of Instrument Engineering for Geophysics and Ecology (IDE)
Design and Technology Institute, Republican Engineering Technical Center, SBRAS
Earth Cryosphere Institute
East European Acoustical Association
Electrochemical Plant
Engelhardt Institute of Molecular Biology, RAS
European University at St. Petersburg
Experimental Factory of Scientific Experiments
Frumkin Institute of Electrochemistry, RAS
Gamelaya Institute for Microbiology and Epidemiology
General Physics Institute
Geoelectromagnetic Research Institute, RAS
Geological Institute, RAS
Geophysical Center, RAS
Gubkin State University of Oil and Gas
ICC Nuclide
Information Transmission Problems Institute
Institute of Applied Physics, RAS
Institute of Atmospheric Optics, RAS
Institute of Biochemistry and Physiology of Microorganisms, RAS
Institute of Biology and Soil Science, FEBRAS
Institute of Biophysics, State Research Center
Institute of Cell Biophysics
Institute of Chemical Kinetics and Combustion
Institute of Chemical Physics, RAS
Institute of Computational Mathematics and Mathematical Geophysics
Institute of Crystallography, RAS
Institute of Cytology and Genetics, SBRAS
Institute of Dynamics of Geosphere, RAS
Institute of Energy Problems of Chemical Physics, RAS
Institute of Experimental Cardiology
Institute of Gene Biology, RAS
Institute of Genetics and Selection of Industrial Microorganisms
Institute of Geochemistry, RAS
Institute of Geology of Ore Deposits, Petrography, Mineralogy and Geochemistry, RAS
Institute of Geophysics, RAS
Institute of Hematology
Institute of High Current Electronics
Institute of High Performance Computation and Databases
Institute of High Temperature Electrochemistry
Institute of Higher Nervous Activity and Neurophysiology, RAS
Institute of Immunological Engineering
Institute of Introscopy, Tomsk Polytechnic Institute
Institute of Lithosphere of Internal and Marginal Seas, RAS
Institute of Mechanics
Institute of Medical Primatology, RAMS
Institute of Metals Superplasticity Problems
Institute of Molecular Genetics
Institute of Nervous Activity and Neurophysiology
Institute of Nuclear Research, RAS
Institute of Ore Deposits, Petrography, Mineralogy and Geochemistry, RAS
Institute of Petroleum Chemistry, SBRAS
Institute of Physical Chemistry, RAS
Institute of Physical Optics, Laser Optics and Information Optical Systems
Institute of Physics and Applied Mathematics, Ural State University
Institute of Physics and Power Engineering
Institute of Poliomyelitis and Viral Encephalitides

Institute of Problems of Mechanical Engineering
Institute of Protein Research, RAS
Institute of Radio Engineering and Electronics
Institute of Solid State Physics, RAS
Institute of Spectroscopy, RAS
Institute of Theoretical and Applied Mechanics
Institute of Theoretical and Experimental Biophysics
Institute of Theoretical and Experimental Physics
Institute of Volcanic Geology and Geochemistry, FEBRAS
International Institute for Earthquake Prediction Theory and Mathematical Geophysics
Intersolarcenter
Ioffe Physico-Technical Institute (Megaimpulse Ltd.)
Ivanovo Central TB Dispensary
Ivanovsky Institute of Virology
Joint Institute of Nuclear Research
Joint Stock Company "Biochimmash"
Joint Stock Company Chimprom
Kamchatka Experimental and Methodological Seismological Dept., FEBRAS
Kamensky-Uralsky Metallurgical Engineering Research Institute
Karpov Institute of Physical Chemistry
Karpov Institute of Physical Chemistry, Obninsk Branch
Keldysh Institute of Applied Mathematics
Khlopin Radium Institute
Komarov Botanical Garden
Kurchatov Institute of Atomic Energy
Lazovsky State Nature Reserve
Lebedev Physics Institute, Astro Space Center
LLC SPE SPEKTR-CONVERSION
Luch Scientific Production Association
Main Computer and Information Science Center (GlavNIVC)
Measurement Systems Research Institute (NIIS)
Mechanical Engineering Research Institute
Medical Radiological Research Center (MRRC)
Mental Health Research Center
Methodological Center for Quality, Public Health Research Institute
Moscow Engineering Physics Institute
Moscow Institute of Physics and Technology
Moscow Institute of Psychiatry, Ministry of Health
Moscow Municipal Psychological Pedagogical Institute
Moscow Power Engineering Institute
Moscow Research Institute of Psychiatry
Moscow State Geological Prospecting Academy
Moscow State University
- Center for Opinion Research
- Department of Biology
- Department of Chemistry
- Department of Geobotany
- Department of Geography
- Department of Geology
- Department of Mechanics and Mathematics
- Department of Physics
- Department of Physiology and Psychophysiology
- Department of Soil Science
- Nuclear Physics Institute

GAP Participant Highlights

Ferroelectric Langmuir-Blodgett Films

The University of Nebraska has been using GAP to administer a collaborative project with the Institute of Crystallography of the Russian Academy of Sciences. The U.S.-Russian team is studying the fabrication of Langmuir-Blodgett (LB) films from varied materials. The researchers are analyzing their properties related to the ferroelectric state, such as nonlinear dielectric response, switching, pyroelectricity, and piezoelectricity.

The potential results of the ongoing collaboration include new applications of inexpensive but versatile electronic materials to computer and transducer technologies. Scientists at the Institute of Crystallography are pioneers in the fabrication and study of LB films and continue to advance the field.

The Spencer Foundation: Promoting Studies of Education

The Spencer Foundation helped develop and support modern studies of education in Russia by assisting talented young scholars. The assistance included helping them to develop new research agendas, enhancing communication among scholars, and creating a productive and sustainable research community.

The main purpose of the Spencer Foundation's program was to establish a network of specialists working in the fields of history, sociology, ethnology, and the economics of education. To achieve that objective, a program, Promoting Social Studies of Education in Russia, was organized through a grant to the European University at St. Petersburg and facilitated by GAP. The European University at St. Petersburg selects young scholars for financial support through a nationwide competition of research projects, organizes summer schools for awardees, and provides opportunities for international exchanges.

Murmansk State Technical University
National Center for Hematology
National Design and Research Institute of Production Engineering (VNIPIPT)
Nesmeyanov Institute of Organoelement Compounds, RAS
Novosibirsk Institute of Bioorganic Chemistry
Nuclear Safety Institute, RAS
Oil and Gas Research Institute
Orel Tuberculosis Dispensary
Pacific Scientific Research Fisheries Center (TINRO)
Paleontological Institute, RAS
Petersburg Nuclear Physics Institute
Pulkov Observatory
Research Center of Mental Health
Research Center of Molecular Diagnostics and Therapy
Research Center of Toxicology and Hygienic Regulation of Biopreparations
Research Institute for Geology and Mineral Resources of the World Ocean
Research Institute of Atomic Reactors
Research Institute of Pulse Technique
Research Institute on Prevention, Treatment and Rehabilitation of Addictions
Russian Association for the Prevention of Sexually Transmitted Infections, Sanam
Russian Research Center for Molecular Diagnostics and Therapy
Russkii Most Management Services, LLC
Saratov State Technical University
Scientific and Industrial Association, RADON
Scientific Technology Center of the Mining and Chemical Combine (STC MCC)
SDB Lazust
SDB Solto
Sechenov Institute of Evolutionary Physiology and Biochemistry, RAS
Shemyakin and Ovchinnikov Institute of Bioorganic Chemistry, RAS
Sikhote-Alinsky Biosphere Nature Preserve
Snezhinsk Physical Technical Institute
SOLITON - NTT Research Center
South Center for Chemical Emergencies
Space Research Institute
SRC Astrophysica
St. Petersburg Electrotechnical University
St. Petersburg Institute for Informatics and Automation, RAS
St. Petersburg State Institute of Technology
St. Petersburg State Pavlov Medical University
St. Petersburg State Technical University
Institute for High Performance Computing and Databases
St. Petersburg State University
State Hydrological Institute
State Institute of Genetics
State Research Center of Virology and Biotechnology (VECTOR)
State Research Institute of Organic Chemistry and Technology (GosNIOKhT)
State Scientific Center for Biotechnology NIIGenetika
State University of Control Systems and Radioelectronics (TSURE)
Steklov Institute of Mathematics, RAS
Subsidiary Enterprise Medequipment of CADB
Tomsk University
Topchiev Institute of Petrochemical Synthesis, RAS
Troitsk Institute for Innovation and Fusion Research (TRINITI)
Ufa State Aviation Technical University
United Institute of Physics of the Earth
Ural Process Engineering, Ltd.
Urals Research Center for Radiation Medicine
Vernadsky Institute of Geochemistry and Analytical Chemistry, RAS
Vernadsky State Geological Museum, RAS
VNIINM ECONA Limited
VNIIOkeanologia
Wildlife Foundation
Wildlife Hunting Management Department
Wildlife Management Department, Khabarovsk Territory
Wildlife Management Institute, FE Branch
Wrangel Island State Reserve
Yaroslavl State Technical University
Yekaterinburg Filial Institute of Physiology, UBRAS
Zelinsky Institute of Organic Chemistry
Zoological Institute, RAS

UKRAINE

Bogomoletz Institute of Physiology, UAS
Institute for Nontraditional Energetics and Electrical Engineering
Institute for Nuclear Research, UAS
Institute of Biochemistry, UAS
Institute of Cell Biology and Genetic Engineering
Institute of Cybernetics, UAS
Institute of Molecular Biology and Genetics, UAS
Institute of Organic Chemistry, UAS
Institute of Surface Chemistry, UAS
International Institute of Cell Biology
Kavetsky Institute of Physiology, UAS
Kharkiv Institute of Physics and Technology
Kyiv National Taras Shevchenko University
Kyiv Polytechnic Institute
Marine Hydrophysical Institute, UAS
Paton Welding Institute, VITOVA, LTD.
State Design Office “Yuznoye” (SDOY)
Ukraine State Chemical Technology University
Zabolotny Institute of Microbiology and Virology

Update from the Field

Health Consequences of the Chernobyl Accident

The Grant Assistance Program has been providing funds delivery and accounting services to the International Consortium for Research on the Health Effects of Radiation (ICRHER) since 1998. A nonprofit organization formed in 1993, the ICRHER addresses concerns about the health consequences of the Chernobyl accident.

Recognizing that exposure to ionizing radiation from Chernobyl did not respect national boundaries, the consortium assembled scientists from the three most affected countries of the FSU—Belarus, Russia, and Ukraine—to investigate the health effects as a single incident. The group is conducting a collaborative case-control study of the relationship between radiation dose and leukemia in children under 6 years of age at the time of the accident. Initial publication of the results is expected by the end of 2002.

The consortium is now in the next phase of the Chernobyl project, which involves a collaborative effort to enhance existing cancer registries and to examine trends that may warrant investigation. Breast and colorectal cancer are areas of particular interest. In addition, a pilot study of post-traumatic stress indicators will be conducted.

World Wildlife Fund Ecoregion

In 1999 the World Wildlife Fund, with support from the U.S. Agency for International Development, opened Ecoregion, a small grants program aimed at biodiversity conservation in the southern regions of the Russian Far East. The initiative, implemented throughout the Amur and Jewish Autonomous Oblasts and the Primorsky and Khabarovsky Krays, focused on three major themes:

- Optimization of the system of protected areas
- Improvement of natural resource management
- Increased awareness of the local population in nature conservation

Through GAP, in 2001, 77 awards totaling over $500,000, were made directly to a variety of FSU nongovernmental organizations, state nature reserves, and educational and research organizations participating in Ecoregion.

TOP (left to right) Arthur Michalek and Kirsten Moysich, Roswell Park Cancer Institute, with Ukrainian colleagues, Alexandra Bondar and Pavel Zamostian, near the Chernobyl reactor
BOTTOM School children in Vladivostok participate in World Wildlife Fund project "Teaching Children to Take Care of the House that We Live In," run by Arsenev State Museum

U.S. Civilian Research and Development Foundation

Statements of Financial Position

	December 31, 2001	December 31, 2000
ASSETS		
Current		
Cash	$ 30,046,371	$ 24,651,890
Restricted cash	3,968,715	4,061,372
Total cash	34,015,086	28,713,262
Investments	1,430,466	1,534,889
Pledges receivable	2,417,289	1,000,000
Other receivables	628,506	674,460
Prepaid expenses	30,342	22,368
Total Current Assets	38,521,689	31,944,979
Non-current		
Pledges receivable	8,505,495	–
Fixed assets, net, less accumulated depreciation of $323,669 and $274,150, respectively	147,659	168,250
Deposits	26,679	26,188
Total Non-current Assets	8,679,833	194,438
Total Assets	$ 47,201,522	$ 32,139,417
LIABILITIES AND NET ASSETS		
Accounts payable	$ 127,236	$ 235,575
Accrued expenses	176,369	94,202
Contracts payable	1,144,995	1,221,238
Grant Assistance Program (GAP) Payable	3,968,715	4,061,372
Deferred revenue	43,183	44,008
Total Liabilities	5,460,498	5,656,395
Unrestricted net assets	2,812,071	2,469,178
Temporarily restricted net assets	38,928,953	24,013,844
Total Net Assets	41,741,024	26,483,022
Total Liabilities and Net Assets	$ 47,201,522	$ 32,139,417

The U.S. Civilian Research and Development Foundation's accounts are derived from the audited financial statements. Copies of the audit are available upon request.

U.S. Civilian Research and Development Foundation

Statements of Activities

For the years ended December 31, *2001*

	Unrestricted	Temporarily Restricted	2001 Total
Revenues:			
Grants and Contracts	$ 844,024	$ 27,710,630	$ 28,554,654
Interest	780,652	115,479	896,131
Contracts—GAP	1,048,357	–	1,048,357
Other income & General Contributions	4,764	–	4,764
Net assets released from restrictions	12,911,000	(12,911,000)	–
Total revenues	15,588,797	14,915,109	30,503,906
Expenses:			
Program Expenses:			
Scientific Research:			
Armenian NFSAT	376,821	–	376,821
Basic Research and Higher Education	1,354,966	–	1,354,966
Closed Cities	4,531	–	4,531
Collaborations in Biomedical and Behavioral Sciences	8,890	–	8,890
Commerciallization Seminars Program	16,059	–	16,059
Cooperative Grants Program	6,251,471	–	6,251,471
Gates Foundation Study	23,732	–	23,732
Georgia Institute Building	35,750	–	35,750
Georgian Travel Program	–	–	–
Junior Scientist Activities	145	–	145
Kyrgyz IGRC	174,118	–	174,118
Moldovan MRDA	601,727	–	601,727
Next Steps to Market Program	1,023,930	–	1,023,930
Nonproliferation: Moldova	11,533	–	11,533
Nonproliferation: Outreach	3,476	–	3,476
Nonproliferation: Research Innovation Centers	17,428	–	17,428
Partner Search Program	68,740	–	68,740
Program Evaluation/Symposia Program	–	–	–
Regional Experimental Support Centers Program	538,889	–	538,889
Royal Society Conference	10,618	–	10,618
Russian Endowed Chairs	–	–	–
Small High-Technology	1,168	–	1,168
Stepnogorsk	109	–	109
Travel Grant Program	572,585	–	572,585
Ukrainian Young Investigators and Workshop	70,342	–	70,342
Uzbek Program	96,657	–	96,657
Total Scientific Research	11,263,685	–	11,263,685
Grant Assistance Program	473,780	–	473,780
Contract Services	711,132	–	711,132
Total Program expenses	12,448,597	–	12,448,597
General and administration	2,797,307	–	2,797,307
Total expenses	15,245,904	–	15,245,904
Change in net assets	342,893	14,915,109	15,258,002
Net assets at beginning of year	2,469,178	24,013,844	26,483,022
Net assets at end of year	$ 2,812,071	$ 38,928,953	$ 41,741,024

The U.S. Civilian Research and Development Foundation's accounts are derived from the audited financial statements. Copies of the audit are available upon request.

	2000	
Unrestricted	Temporarily Restricted	2000 Total
$ 856,684	$ 16,155,058	$ 17,011,742
900,467	185,992	1,086,459
872,993	–	872,993
–	–	–
8,683,592	(8,683,592)	–
11,313,736	7,657,458	18,971,194
52,636	–	52,636
1,894,271	–	1,894,271
4,099	–	4,099
98,175	–	98,175
114	–	114
2,837,736	–	2,837,736
83,063	–	83,063
2,379	–	2,379
433	–	433
–	–	–
172,847	–	172,847
162,548	–	162,548
1,019,558	–	1,019,558
–	–	–
–	–	–
–	–	–
24,548	–	24,548
727	–	727
125,801	–	125,801
–	–	–
185	–	185
37,194	–	37,194
34,072	–	34,072
578,293	–	578,293
95,929	–	95,929
83,350	–	83,350
7,307,958	–	7,307,958
514,060	–	514,060
749,299	–	749,299
8,571,317	–	8,571,317
1,836,700	–	1,836,700
10,408,017	–	10,408,017
905,719	7,657,458	8,563,177
1,563,459	16,356,386	17,919,845
$ 2,469,178	$ 24,013,844	$ 26,483,022

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