

Originally Processed With FOIA(s):
2005-0336-F

FOIA Number:
2005-0336-F

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National Science Foundation Memo of Understanding

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MEMORANDUM OF UNDERSTANDING
ON
COOPERATION IN THE FIELD OF BASIC SCIENTIFIC RESEARCH
BETWEEN

THE NATIONAL SCIENCE FOUNDATION
OF THE UNITED STATES OF AMERICA

AND

THE ACADEMY OF SCIENCES
OF THE UNION OF SOVIET SOCIALIST REPUBLICS

The National Science Foundation of the United States of America and the Academy of Sciences of the Union of Soviet Socialist Republics, hereinafter referred to as "the Parties",

HAVE AGREED as follows:

ARTICLE I. GENERAL PROVISIONS

This Memorandum of Understanding is subject to the general principles defined by both Governments in the Agreement between the Government of the United States of America and the Government of the Union of Soviet Socialist Republics on Cooperation in the Field of Basic Scientific Research signed January 8, 1989, hereinafter referred to as the "Basic Scientific Research Agreement," and to the internal regulations and procedures of each Party.

ARTICLE II. DEFINITION

Taking into account that fundamental and applied research involve a continuum of scientific activity, for the purposes of this Memorandum of Understanding, "basic scientific research" means theoretical or experimental research having as its objective the acquisition of fuller knowledge or understanding of the elemental principles of phenomena and observable facts; such research extends the knowledge base from which many societal benefits ultimately flow and, in the framework of this Memorandum of Understanding, such research is not designed for the transformation of new discoveries into applied technologies. The foregoing definition does not preclude subsequent application of knowledge and understanding gained from basic scientific research conducted under this Memorandum of Understanding, subject to the extent of rights under Annex II of the Basic Scientific Research Agreement.

ARTICLE III. PRINCIPLES

1. The aim of this Memorandum of Understanding is to contribute to the broadening of cooperative scientific activities of mutual benefit between scientific institutions, government and nongovernment agencies, higher educational institutions, and individual scientists, specialists and researchers (hereinafter referred to as "partners") of the two countries for the purpose of advancing scientific knowledge by combining the complementary efforts, capabilities, and talents of leading researchers of the two countries, and sharing resources in areas of strong mutual interest and competence.

2. The scope of the cooperation between the Parties will be limited to the list of scientific areas agreed to by both Governments in Annex III of the Basic Scientific Research Agreement.

3. The Parties have jointly identified initial specific topics for cooperation, listed in Annex II of this Memorandum of Understanding, and have agreed to review them periodically as provided in Article VI.

4. This Memorandum of Understanding shall be without prejudice to other agreements and other arrangements concluded between agencies or organizations of the two countries.

5.a. Cooperation under this Memorandum of Understanding shall facilitate and support exchange of scientists and cooperative scientific activities. This cooperation shall consist primarily of three elements: Cooperative Scientific Research Projects, Joint Seminars and Workshops, and Individual Scientific Visits. Other forms of cooperation may be added by agreement of the Parties.

5.b. The main objective of this Memorandum of Understanding will be to promote direct cooperation between scientific institutions and scientists of the two countries based on cooperative scientific research projects approved by the Parties. In connection with this, the primary aim of Joint Seminars and Workshops and of Individual Scientific Visits will be to identify jointly agreed scientific research priorities in the fields of science mutually agreed upon by the Parties and to develop concrete proposals for future cooperative scientific research projects in these fields.

6. Cooperative activities under this Memorandum of Understanding will be conducted in accordance with the respective international obligations, national laws, regulations and procedures of each country.

7. Obligations assumed by the Parties are subject to the availability of funds. Each side will share in the effort and the cost of each specific activity. Although this provision does not require a precise matching of funds, personnel, or facilities in any given activity, both sides agree that on the whole the implementation of cooperation under this Memorandum of Understanding must be balanced and of mutual benefit.

8. The National Science Foundation will be responsible for coordinating all American participation under this Memorandum of Understanding, and the Academy of Sciences of the U.S.S.R. will be responsible for coordinating all Soviet participation. Both Parties will use their best efforts to involve the appropriate higher educational institutions, scientific research institutions, and other scientific organizations not under their jurisdiction.

9. Scientific results and information derived from a specific activity under this Memorandum of Understanding shall be made available to the world scientific community through customary channels in accordance with normal scientific procedures. This provision shall be implemented with due regard for intellectual property rights as specified in Annex II of the Basic Scientific Research Agreement and Article V of this Memorandum of Understanding.

10. Individual scientists, specialists, researchers, and scientific institutions of third countries or international organizations may be invited, upon consent of both Parties, to participate in activities being carried out under this Memorandum of Understanding. The cost of such participation shall normally be borne by the third parties unless both sides agree otherwise in writing.

ARTICLE IV. ORGANIZATION AND ADMINISTRATION

Specific conditions for the organization and administration of the implementation of cooperation under this Memorandum of Understanding, including responsibilities, procedures, and financial arrangements, are set forth in Annex I to this Memorandum of Understanding.

ARTICLE V. INTELLECTUAL PROPERTY RIGHTS

1. Inventions. If an invention is made under this Memorandum of Understanding as a result of cooperative activity within the meaning of Annex II, Section III, Paragraph D of the Basic Scientific Research Agreement, the following provisions shall apply:

a. Each Party has the right to obtain all rights and interests in the invention in its own country.

b. If a Party decides not to obtain such rights and interests in its own country, the other Party has the right to do so. However, such rights are subject to a nonexclusive, royalty-free license to the first Party to practice the invention in its own country, with the right to grant sublicenses in that country in accordance with that country's laws and practices.

c. The Party in whose country the invention was made has first option on obtaining rights in third countries.

d. In any country where one Party decides not to obtain such rights and interests, the other Party has the right to do so.

2. Copyrights. With reference to Section II of Annex II of the Basic Scientific Research Agreement, the following provisions shall apply to copyright protection for works created under this Memorandum of Understanding:

a. Except as otherwise provided, each Party is entitled to a nonexclusive, irrevocable, royalty-free license under a copyright, secured in accordance with the national laws of either Party, to translate, reproduce, publish, and distribute published scientific, technical, and medical works in its own territory, with the right to grant sublicenses in that country in accordance with that country's laws and practices. Any such copyrighted work shall indicate the names of all persons who participated in the joint work. Either Party is entitled to such a license in third countries upon request.

b. Rights to other copyrighted works shall be allocated in the same manner as Inventions in Annex II, Section III, Paragraph C of the Basic Scientific Research Agreement and Article IV, Paragraph 1 herein. A Party receiving rights pursuant to this provision to copyrighted works which embody business-confidential information shall protect such information in accordance with Section IV of Annex II of the Basic Scientific Research Agreement.

ARTICLE VI. JOINT REVIEW OF COOPERATION

Representatives of the Parties will meet periodically at Washington or Moscow as necessary, but normally once a year, to evaluate the results of the activities under this Memorandum of Understanding, to consider modifications of the program of cooperation, to communicate to each other information about new scientific priorities within their respective countries, and to exchange information on administrative matters relating to implementation of cooperation under this Memorandum of Understanding.

ARTICLE VII. ENTRY INTO FORCE, TERMINATION, MODIFICATION

1. This Memorandum of Understanding will enter into force upon signature by both Parties, and will remain in effect for a period of five years. Either Party may at any time give written notice to the other Party of its intention to terminate this Memorandum of Understanding, in which case this Memorandum of Understanding will terminate six months from the date notice is received by the other Party.

2. The Parties may, by mutual consent in writing, modify this Memorandum of Understanding and the Annexes thereto. They may renew it for additional five-year periods by an exchange of letters. Expiration, termination, or modification of this Memorandum of Understanding shall not affect the implementation or completion of any project that has been jointly approved by the Parties under this Memorandum of Understanding.

DONE at _____, this _____ day of _____ 1989, in the English and Russian languages, both texts being equally authentic.

FOR THE NATIONAL SCIENCE FOUNDATION
OF THE UNITED STATES OF AMERICA:

FOR THE ACADEMY OF SCIENCES OF THE
UNION OF SOVIET SOCIALIST REPUBLICS:

ANNEX I

IMPLEMENTING CONDITIONS FOR THE MEMORANDUM OF UNDERSTANDING ON COOPERATION IN THE FIELD OF BASIC SCIENTIFIC RESEARCH BETWEEN

THE NATIONAL SCIENCE FOUNDATION
OF THE UNITED STATES OF AMERICA

AND

THE ACADEMY OF SCIENCES
OF THE UNION OF SOVIET SOCIALIST REPUBLICS

SECTION I. INTRODUCTION

In accordance with Article IV of the cited Memorandum of Understanding, the National Science Foundation (NSF) and the Academy of Sciences of the U.S.S.R. (ASUSSR) agree upon the following conditions for the organization and administration of Cooperation in the Field of Basic Scientific Research.

SECTION II. ORGANIZATION OF COOPERATION

1. The Parties to this Memorandum of Understanding will be responsible jointly for direct transaction of all policy matters and for the overall coordination of activities under this Memorandum of Understanding. Each Party shall designate an Official who shall be the principal point of contact for the other Party in the conduct of the business of this Memorandum of Understanding.

Additional participating organizations on each side shall also designate Organization Coordinators who shall be the principal points of contact for their organizations.

2. The Parties shall receive, evaluate for merit, and insure conformance with provisions of this Memorandum of Understanding proposals and applications originating from scientists of each side. Proposed activities may be implemented under this Memorandum of Understanding only upon approval by both Parties, as described in Section IV, below.

3. In accordance with the international obligations, national laws, regulations, and procedures of each country, the Parties will seek to facilitate, through collaboration with appropriate authorities, the granting of visas and other forms of official permission for entry to and exit from their respective national territories of participants in specific activities approved by the Parties, and to facilitate waiver of custom duties on equipment and supplies required to carry out such activities.

SECTION III. TYPES OF ACTIVITY

1. Projects of mutually beneficial cooperative scientific research will be designed jointly by interested scientists and scientific research institutions of both countries in direct consultation with each other. Written proposals, based on understandings reached between cooperating scientists, will be submitted concurrently through appropriate institutional channels by the American scientist to the NSF, and by the Soviet scientist to the ASUSSR, for evaluation and determination. These proposals must include the title, the name of the principal investigator and lead organization in each country, a description of the scientific project, the nature of the cooperative activities to be undertaken including major equipment required, anticipated travel, a list of all participants with biographic and bibliographic data, and the proposed starting date and duration. Proposals for cooperative research projects must be submitted at least nine months in advance of the proposed starting date.

2. Joint workshops and seminars may be held in either country for a period of three to five days, normally with no more than five to ten participants from each country, and may include directly related scientific visits. Written proposals for workshops or seminars, based on understandings reached between the American and Soviet scientists or institutions organizing the activity (hereinafter referred to as "organizers"), must clearly identify the proposed organizers as well as other major participants. Such proposals, based on understandings reached between the organizers, will be submitted concurrently through appropriate institutional channels by the American organizer to the NSF, and by the Soviet organizer to the ASUSSR, for evaluation and determination approximately nine months before the proposed meeting date. Although workshops and seminars will ordinarily be binational, the U.S. and Soviet organizers may, on the basis of mutual agreement, invite highly qualified specialists from other countries to participate at their own expense.

3. Individual Short-Term Scientific Visits, usually not in excess of two weeks, may be made by scientists of one country to the other to consult and share scientific research experiences in order to plan cooperative scientific research activities with their colleagues of the other country. A written proposal outlining the purpose and other details of the intended visit will be prepared by the interested scientist and submitted by the American scientist to the NSF, or by the Soviet scientist to the ASUSSR, for evaluation and determination. These proposals must be submitted by the sending Party to the receiving Party at least four months in advance of the start of the visit.

4. The initial emphasis of cooperation under this Memorandum of Understanding will be upon workshops and seminars in the research areas preselected by the Parties. Subsequently, the emphasis will shift to cooperative research projects.

SECTION IV. IMPLEMENTATION

1. Each Party will encourage scientists of its country to initiate direct correspondence or other communication with colleagues of the other country to determine possible interest in developing a cooperative research project or other activity.

2. Proposals will be jointly initiated by interested scientists of both countries as set forth in Section III of this Annex, and will be submitted concurrently to the Parties in each country in accordance with their established regulations and procedures. Each Party will evaluate the proposals submitted to it, determine if funding is available, exchange pertinent information with the other Party, and reach joint decisions with it on submitted proposals to be approved.

3. Final agreement on support of a scientific activity will be established by an exchange of letters or telegrams between the Officials of the Parties. Each such communication will include the exact title of the proposed activity, the names and organizations of the principal investigators of both sides, as well as information about the starting date and duration of the activity. The Parties will endeavor to inform each other about the recommended disposition of each proposal for a cooperative research project or workshop within six months, but in no case more than nine months, of receipt of the proposal. In the case of individual scientific visits, the parties will inform each other within three months.

4. The Parties agree to take all appropriate and necessary action to achieve the fulfillment of the terms and conditions for each activity as specified in the proposal and as officially agreed in writing by the Parties. Subsequent changes to the scope of work, principal participants, or performance period of the activity can be made only if proposed in writing by the investigators and explicitly agreed to by both Parties.

5. Communications dealing with development, implementation, and performance of the proposed or approved activities are carried out directly between the partners, with notification to the Parties.

6. Principal investigators and their institutions whose proposals or applications have been approved for implementation in the manner specified above will be responsible for the performance of the approved activity and for the proper use of funds. Principal investigators of each side will also be responsible for reporting to their respective Parties on the status and progress of their activity.

7. In order to facilitate implementation of this Memorandum of Understanding, partners of one country intending to visit partners of the other country for purposes of developing or implementing cooperation under this Agreement are to so indicate in applying for permission to enter.

SECTION V. FINANCIAL CONDITIONS

1. For all activities under this Memorandum of Understanding, each side will support the basic costs of the activity within the territory of its country. This may include, for example, the salaries of its own scientists, technicians, and other support staff, and the cost of domestic travel, materials and supplies, equipment (including time charges for equipment use), and publication costs.

2. When a participant in an approved activity travels to the other country, the receiving side shall additionally provide, or meet the expense of, the following needs of each foreign visitor: lodging, subsistence, domestic transportation directly connected with the approved scientific objectives, and medical and hospital coverage in case of sickness or accident according to normal practices in each country. Lodging to be provided by the receiving side shall be appropriate to the professional level of the visiting scientist and, as far as possible, to the needs of accompanying dependents. The receiving side shall provide subsistence and other allowances at rates established in Annex III to this Memorandum of Understanding.

3. The Parties agree to review, at the request of either Party, the subsistence allowances provided to American and Soviet visiting scientists under this Memorandum of Understanding and to make any necessary adjustments to Annex III. These adjustments will be made by joint agreement through an exchange of correspondence between the Officials of the two Parties.

4. The sending side shall meet the expenses of the salary and international travel of its own participants to destinations agreed by the Parties in the receiving country.

ANNEX II

AREAS AND TOPICS
FOR COOPERATION IN THE FIELD OF BASIC SCIENTIFIC RESEARCH
BETWEEN

THE NATIONAL SCIENCE FOUNDATION
OF THE UNITED STATES OF AMERICA

AND

THE ACADEMY OF SCIENCES
OF THE UNION OF SOVIET SOCIALIST REPUBLICS

1. MATHEMATICS

- o Complex analysis
- o Geometry (differential, algebraic, and topology)
- o String theory
- o Differential equations
- o Algebraic structures
- o Representation theory
- o Control theory
- o Dynamical systems
- o Algebra
- o Mathematical physics

2. THEORETICAL PHYSICS

- o Theoretical nuclear physics
- o Relativistic astrophysics
- o Mathematical physics
- o Theoretical atomic, molecular, optical, and plasma physics
- o Cosmic ray physics
- o Condensed matter theory
- o Cosmology

3. SCIENTIFIC PROBLEMS OF THE ARCTIC AND THE NORTH

- o Global biogeochemical cycles
- o Permafrost studies related to world climate change
- o Studies of the magnetospheric cusp

4. GEOSCIENCES

- o Global change
- o Global biogeochemical cycles
- o Regional geology, stratigraphy, and tectonics
- o Paleontology and geochronology
- o Magmatic and metamorphic processes
- o Volcanoes and volcanic processes
- o Paleoclimate and climate change
- o Surficial processes and geomorphology
- o Continental lithospheric seismology, geophysics, and geochemistry
- o Seismic risk and earthquake prediction
- o Continental scientific drilling
- o Physical and chemical properties of the earth's interior
- o Upper mantle studies

5. CHEMISTRY

- o Molecular environmental catalysis
- o Bioelectrochemistry of membranes

6. LIFE SCIENCES

- o Plant biology (flowering research)
- o Cell biology
- o General and cellular physiology
- o Biodiversity
- o Ecology
- o Protein polymorphisms and other molecular-genetic markers in domesticated plants and animals
- o Developmental biology
- o Neurochemistry

7. BASIC RESEARCH IN ENGINEERING SCIENCES

- o Thermal engineering (heat and mass transfer)

8. SCIENCE POLICY

- o Exchange of information on R&D funding, R&D personnel, and R&D policy.

ANNEX III
FINANCIAL CONDITIONS OF COOPERATION
IN THE FIELD OF BASIC SCIENTIFIC RESEARCH
BETWEEN

THE NATIONAL SCIENCE FOUNDATION
OF THE UNITED STATES OF AMERICA

AND

THE ACADEMY OF SCIENCES
OF THE UNION OF SOVIET SOCIALIST REPUBLICS

The National Science Foundation and the Academy of Sciences of the U.S.S.R. agree to meet the following expenses of visits by foreign scientists in their countries under the terms of this Memorandum of Understanding on Cooperation in the Field of Basic Scientific Research:

1. lodging appropriate to the professional level of the visiting scientist and, as far as possible, to the needs of accompanying dependent family members, in accordance with the provisions of Paragraph 4 below; and
2. subsistence allowances at rates not less than the following:

	<u>In U.S.S.R.</u>	<u>In U.S.A.</u>
A. Visits of one month or less, per day:	18 Rubles	\$ 30
B. Visits longer than one month, per month, for the visiting scientist:	420 Rubles	\$ 700
Visits longer than three months, per month, for the accompanying spouse:	60 Rubles	\$ 100
For each accompanying dependent child:	50 Rubles	\$ 80

The above sums will be paid to the visiting scientist commencing with his or her first day in the receiving country for participation in research under the terms of this Memorandum of Understanding.

3. Each side will cover expenses related to sickness or accident in accordance with the normal practices in each country.

4. The subsistence allowances described in Paragraph 2' above, and the coverage of expenses related to sickness or accident described in Paragraph 3 above, will be available only for accompanying dependent family members who remain, together with the scientists, in the receiving country for a period of three months or more. Accompanying dependent family members of scientists participating in cooperative scientific research projects and who remain in the receiving country for periods of less than three months may visit at their own expense. Normally, however, dependent family members will not accompany scientists participating in project development activities such as workshops, seminars, or individual short-term scientific visits.

EXPEDITE

Cleared
8/21
JFO

MEMORANDUM

August 2, 1991

TO: GOSSAT Addressees (listed below)
FROM: State/EUR/SOV/SOEX - Richard A. Figueroa
SUBJECT: NSF Proposal for Interagency Review

Attached are ⁸ proposals submitted by the National Science Foundation for interagency review. We would appreciate your agency's comments or recommendations by August 30, 1991. You are invited to direct any questions relating to the content of these materials to Gerson Sher, Program Manager for USSR and Eastern Europe, NSF, tel. (202) 357-7494; fax # 357-5839. Requests for more detailed descriptions should also be referred to NSF.

Agency comments or recommendations should be in writing and should be sent to both NSF and State, Attn: EUR/SOV. We request that agencies having classified comments provide State and NSF separate unclassified versions that would be suitable for public record.

Attachments: As stated.

Addressees:

COMEX - Keith Fennell
DOC - Sheri Fox
OMB - James Nix
DOD - John Thomas
OSTP - John O'Neill
USTR - Carmen Suro-Bredi
DOJ - Gerald Schroeder
DOE - Harold Jaffe
Navy - Sheldon Turetsky
NSF - Gerson Sher
USGS - Paul Hearn
NSC - Eric Melby
OES - Cathleen Campbell
NOAA - Barbara Moore

COVER SHEET OF COOPERATIVE WARSAW PACT S&T ACTIVITY

- 1) File No. _____ 2) Agency NSF 3) Country USSR
4) Agreement Basic Science 5) Begin 10/91 6) Duration 1 mo.
7) Title Planning Meeting for Arctic Ocean Research
8) Counterparts A) US: Dr. Peter Wilkniss B) FO: Dr. A. Chilingarov
9) Researchers: A) US 5-7 B) FO 20
10) Visits: A) To US 0 B) To FO 1
11) US Sites None
12) FO Sites MOSCOW
13) Summary: This is an NSF-led planning meeting for Arctic Ocean-
Atmosphere-Ice Interaction research aboard the Soviet nuclear icebreaker,
Sovetskiy Soyuz. A previous, essentially unilateral effort to secure Soviet
permission to utilize this vessel during Summer 1991 failed at the last
minute. This meeting is intended to ensure a more comprehensive, bilateral
approach for the Summer 1992 season. In December 1990 GOSSAT received a
report about the project and expressed no objection. All necessary
export licenses for shipping research equipment have been obtained (see
attached). Interagency clearance is being requested at this time because
the project is being recast as a formal bilateral effort; however, the
content is unchanged.
14) Cost \$ 500,000 (est.) 15) Within agency budget? Yes X No _____
16) Benefits The Soviet Union's Sovetskiy Soyuz icebreaker offers a
unique capability of transiting the Arctic Ocean to the North Pole and
allowing research scientists to conduct urgently need research on sea-air-
ice interactions that are vital to the global change research effort.
This opportunity has never before been available to American researchers.
17) IPR Scientific publications.
18) Commercial Applications None foreseen in the immediate future.
19) Contact: Dr. Gerson Sher, NSF/INT
20) Phone: 357-7494 21) FAX 357-5839 22) bitnet gsher@nsf
internet gsher@nsf.gov

Date Received in EUR/SOV _____

COVER SHEET OF COOPERATIVE WARSAW PACT S&T ACTIVITY

- 1) File No.: SES-9112420 2) Agency: NSF 3) Warsaw Pact Country: UR
- 4) Agreement: Basic Science 5) Begin: 09/91 6) End: 08/94
- 7) Title: "US-USSR Cooperative Research: Cryospheric Indices of Global Change"
- 8) Counterparts: A) US: Dr. R. Barry B) FO: Dr. A. Krenke
- 9) Researchers: A) US: 3 B) FO: 3
- 10) Visits: A) To US: 7 B) To FO: 4
- 11) US Institutions and/or sites: University of Colorado, Boulder
- 12) FO Institutions and/or sites: Institute of Geography, Academy of Sciences, Moscow
- 13) Summary: The primary objective of this research project is to acquire and analyze data on snow and ice cover in the US and USSR in order to assess their utility as indices of global environmental change. Researchers will focus their investigations on 1) identification of statistical relationships between meteorological variables and changes in snow pack, 2) climate-glacier system relationships, 3) development and testing of remote sensing methods to map snow cover using passive microwave data, and 4) to explore the applicability of various methods used by Soviet glaciologists in regional scale assessments of climatic variables. They will use data gathered from field sites and surveys and satellite passive microwave data. The project will provide tests of new means of gathering data using remote sensors.
- 14) Major equipment: None
- 15) Cost: \$ 244,120 16) Personnel: 6 mos. approx.
- 17) Benefits: The results are expected 1) to improve the ability to monitor key environmental indicators on a hemispheric scale and 2) to determine the nature and controls of recent changes in snow cover and glaciers in the study areas and their implications for global change studies. The data gathered should provide valuable new information with which to test hypotheses about the degree to which cryospheric variables may be used as indices of global environmental change.
- 18) IPR: Scientific publications.
- 19) Commercial Applications: None foreseen in the immediate future.
- 20) Contact: Gerson Sher, 357-7494
FAX 202/357-5839

Date Received in EUR/SOV _____

COVER SHEET OF COOPERATIVE WARSAW PACT S&T ACTIVITY

- 1) File No.: PHY-9116466 2) Agency: NSF 3) Warsaw Pact Country: UR
- 4) Agreement: Basic Science 5) Begin: 07/91 6) End: 06/93
- 7) Title: "US-USSR Cooperative Research: Development of Detectors
Combining Particle Tracking and Electron Identification"
- 8) Counterparts: A) US: Dr. W. Willis B) FO: Dr. B. Dolgoshein
- 9) Researchers: A) US: 3 B) FO: 3
- 10) Visits: A) To US: 2 B) To FO: 2
- 11) US Institutions and/or sites: Columbia University
- 12) FO Institutions and/or sites: Laboratory of Moscow, Physical
Engineering Institute
- 13) Summary: The primary objective of this research project is to develop tracking detectors for use at the Superconducting Supercollider. Researchers will investigate construction and readout techniques for the detection of charged particles in an environment of a billion events/second to initiate the development of an optoelectronic readout. They seek to establish a prototype straw tube tracking and TRD system for high luminosity colliders. The US and Soviet PIs have a history of collaboration and both are already funded to work separately on this project. This project seeks to reprogram funding to allow for collaboration. No supercomputers are required for this project.
- 14) Major equipment: None
- 15) Cost: \$ no additional funds 16) Personnel: 4 mos. approx.
- 17) Benefits: The results of this project are expected to find application in new experiments in high energy physics in addition to producing tracking detectors for use at the Superconducting Supercollider.
- 18) IPR: Scientific publications.
- 19) Commercial Applications: None foreseen in the immediate future.
- 20) Contact: Gerson Sher, 357-7494
FAX 202/357-5839

Date Received in EUR/SOV _____

COVER SHEET OF COOPERATIVE S&T ACTIVITY

- 1) File No.: 91-15649 2) Agency: NSF 3) Warsaw Pact Country: UR
- 4) Agreement: Basic Science 5) Begin: 12/91 6) End: 11/94
- 7) Title: "US-USSR Cooperative Research: Spectra of Cosmic Gamma-ray Bursts: compatibility Between Observations and Theories"
- 8) Counterparts: A) US: Dr. Vahe Petrosian B) FO: Dr. Igor Mitrofanov
- 9) Researchers: A) US: 2 B) FO: 2
- 10) Visits: A) To US: 4 B) To FO: 4
- 11) US Institutions and/or sites: Stanford University
- 12) FO Institutions and/or sites: Institute for Space Research, Academy of Sciences
- 13) Summary: The primary objective of this research project is the study of compatibility between observations and theories that seem the most worthwhile approach to solving the problem of the origin of cosmic gamma-ray bursts (GRBs). In their study, the researchers plan to focus on three areas: 1) the main properties of spectra of GRBs, leading to estimations of parameters of broad-band components and narrow line-like features, as function of time; 2) the energizing and spectral formation with gamma-ray burster emission regions; and 3) the comparison between theoretical models and observed spectral data of GRBs to determine an explanation of emission mechanism and physical parameters.
- 14) Major equipment: None
- 15) Cost: \$ 37,200 16) Personnel: 4 mos. approx.
- 17) Benefits: The results of this research project in cosmology and theoretical physics may fruitfully combine newly obtained observational data on GRBs available in the Institute of Space Research (USSR) with theoretical models for cyclotron emission of gamma-rays in magnetosphere of neutron stars obtained at Stanford University (USA). In addition to advancing basic scientific knowledge, this project will afford for training and education of both Soviet and American young researchers.
- 18) IPR: Scientific publications.
- 19) Commercial Applications: None foreseen in the immediate future.
- 20) Contact: Gerson Sher, 357-7494
FAX 202/357-5839

Date Received in EUR/SOV _____

COVER SHEET OF COOPERATIVE S&T ACTIVITY

- 1) File No.: 91-18408 2) Agency: NSF 3) Warsaw Pact Country: UR
- 4) Agreement: Basic Science 5) Begin: 04/92 6) End: 03/94
- 7) Title: "US-USSR Cooperative Research: the origin and evolution of ultra-magnesian metamorphic rocks: A petrological and structural study of examples in the southwestern Pamir Mountains, USSR"
- 8) Counterparts: A) US: Dr. Edward Grew B) FO: Dr. Nikolay Pestsev
- 9) Researchers: A) US: 4 B) FO: 3
- 10) Visits: A) To US: 3 B) To FO: 1
- 11) US Institutions and/or sites: University of Maine
- 12) FO Institutions and/or sites: Institute of Geology of Ore Deposits, Academy of Sciences
- 13) Summary: The primary objective of this research projet is to produce an integrated petrologic, geochemical, geochronologic, and structural study of ultra-magnesian metamorphic rocks of the Pamier Mountiains, Tajikistan. Researchers will deduce the metamorphic history of the rocks from the phase relations among talc, kyanite and amphibole. The pressure-temperature conditions of metamorphism will be calculated from microprobe analyses of minerals. The roles of borosilicates tourmaline and kornierupine in controlling the behaviour of boron during high-grade metamorphism will be studied. Ultra magnesian rocks will be anlysed for major and trace elements in order to determine whether they originated from sediments associated with magnesite marble. Kinematic analysis will be used to study structural evolution.
- 14) Major equipment: None
- 15) Cost: \$117,588 16) Personnel: 15 mos. approx.
- 17) Benefits: The results of this geological research project may further understanding of the processes involved in metamorphism. In particular, knowledge may be generated regarding how individual minerals control the bulk chemical composition during metamorphism and how tectonic movements result in burial and exhumation of these methamophic assemblages.
- 18) IPR: Scientific publications.
- 19) Commercial Applications: None foreseen in the immediate future.
- 20) Contact: Gerson Sher, 357-7494
FAX 202/357-5839

Date Received in EUR/SOV _____

COVER SHEET OF COOPERATIVE S&T ACTIVITY

- 1) File No.: 91-17412 2) Agency: NSF 3) Warsaw Pact Country: UR
- 4) Agreement: Basic Science 5) Begin: 01/92 6) End: 12/93
- 7) Title: "US-USSR Cooperative Research: Diamonds in Crustal Gneisses: Result of Deep Subduction or Metastable Growth At Low Pressure"
- 8) Counterparts: A) US: Dr. Harry Green B) FO: Dr. Larissa Dobrzhinetskaya
- 9) Researchers: A) US: 3 B) FO: 3
- 10) Visits: A) To US: 2 B) To FO: 1
- 11) US Institutions and/or sites: University of California, Davis
- 12) FO Institutions and/or sites: Institute of Lithosphere, Academy of Sciences
- 13) Summary: The primary objective of this research project is to test the stable growth hypothesis. Researchers will apply phase equilibrium studies at very high pressure to ascertain whether or not equilibrium of these rocks in the diamond stability field produces phases of the same composition as contain the natural microdiamonds. Depending on the success of preliminary studies, researchers may conduct other experiments designed to investigate the hypothesis that metastable growth occurred during the large deformations that these rocks have undergone.
- 14) Major equipment: None
- 15) Cost: \$22,050 16) Personnel: 12 mos. approx.
- 17) Benefits: The results of this research in geology may demonstrate that in the past, subduction of continental rocks occurred to much greater depths than heretofore thought possible. Evidence of the aforementioned subduction could open the possibility of new interpretations of mantle processes.
- 18) IPR: Scientific publications.
- 19) Commercial Applications: None foreseen in the immediate future.
- 20) Contact: Gerson Sher, 357-7494
FAX 202/357-5839

Date Received in EUR/SOV _____

COVER SHEET OF COOPERATIVE S&T ACTIVITY

- 1) File No.: 91-20077 2) Agency: NSF 3) Warsaw Pact Country: UR
- 4) Agreement: Basic Science 5) Begin: 01/92 6) End: 12/94
- 7) Title: "US-USSR Cooperative Research: Investigations on Realizations of Conformal Symmetry in Part., Field and Strings"
- 8) Counterparts: A) US: Dr. S. J. Gates, Jr. B) FO: Dr. S. I. Vashakidze
- 9) Researchers: A) US: 4 B) FO: 4
- 10) Visits: A) To US: 6 B) To FO: 2
- 11) US Institutions and/or sites: University of Maryland
- 12) FO Institutions and/or sites: Tbilisi State University & Soviet Academy
- 13) Summary: The primary objective of this research project is to study the realizations of two dimensional conformal symmetry and its implications in field theories of particles and strings. The researchers would like 1) to elucidate the structure of D=10 superspace-supergravity-superstring geometries and 2) to produce a universal description for all possible four dimensional field theory effective actions related to heterotic strings. They plan to use the tools that have been developed within the context of the o-model approach.
- 14) Major equipment: None
- 15) Cost: \$71,600 16) Personnel: 36 mos. approx.
- 17) Benefits: The results of this research in theoretical physics are likely to advance the study of strings. New information produced from this study may improve our understanding of the theory of relativistic strings, which may provide the first realistic, renormalizable unified theories of fundamental forces and matter.
- 18) IPR: Scientific publications.
- 19) Commercial Applications: None foreseen in the immediate future.
- 20) Contact: Gerson Sher, 357-7554
FAX 202/357-5839

Date Received in EUR/SOV _____

COVER SHEET OF COOPERATIVE S&T ACTIVITY

- 1) File No.: INT-9119302 2) Agency: NSF 3) Warsaw Pact Country: UR
- 4) Agreement: Basic Science 5) Begin: 09/91 6) End: 02/94
- 7) Title: "US-USSR Cooperative Workshop: Semiconductor Theory Workshop"
- 8) Counterparts: A) US: Dr. Michael Shur B) FO: Dr. Alexei Efros
- 9) Researchers: A) US: 10 B) FO: 10
- 10) Visits: A) To US: 10 B) To FO: 0
- 11) US Institutions and/or sites: University of Virginia
- 12) FO Institutions and/or sites: A.E. Ioffe Institute of Physics & Technology
- 13) Summary: The primary objective of this proposal for a research workshop in semi-conductor theory is to facilitate the establishment of joint US-USSR theoretical research projects. The organizers expect that one possible topic to be considered will be hot electrons in heterostructures.
- 14) Major equipment: None
- 15) Cost: \$15,000 16) Personnel: 1 mos. approx.
- 17) Benefits: This proposal for a collaborative US-USSR workshop is likely to produce proposals for research projects of interest to funding agencies in the United States, e.g. National Science Foundation and the Soviet Union. Additionally, semiconductor theory is one of the strongest areas of research in the Soviet Union, and the Soviet semiconductor theorists are among the best scientists in the world, so US researchers will likely benefit from this opportunity to meet with their Soviet colleagues.
- 18) IPR: Scientific publications.
- 19) Commercial Applications: None foreseen in the immediate future.
- 20) Contact: Gerson Sher, 357-7494
FAX 202/357-5839