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DIRECTORATE OF INTELLIGENCE

2 December 1987

# Soviet Perspectives on a New US-USSR Scientific Cooperation Agreement

## Summary

**Assuming the upcoming Washington summit goes well, we expect the Gorbachev regime to pursue, and perhaps attempt to accelerate, talks leading to a new intergovernmental agreement on cooperation in basic science. We believe the Soviets have multiple objectives in seeking such an agreement:**

- **Support Gorbachev's economic modernization program.**
- **Enhance military capabilities.**
- **Advance basic science.**

**Such an agreement would be an added step in improving Gorbachev's domestic and international reputation. Gorbachev probably sees such an agreement as a means of further enhancing his image as a world leader interested in peaceful cooperation and able to deal effectively with the United States on complex issues.** [redacted] 25X1

**While we are certain that from Moscow's perspective the benefits significantly outweigh the risks, the Soviets probably are apprehensive about the costs of resuming scientific cooperation. Their concerns probably focus on an agreement's implications for:**

- **Continuing technological dependence on the West.**
- **Giving the US access to the Soviet S&T complex.**
- **Potential transfer of science/technology to the United States.**
- **Possible defections of Soviet scientists.** [redacted] 25X1

**At present, discussions on a formal agreement restrict cooperation to the basic sciences. But we believe the Soviets are likely to push the boundaries toward engineering and industrial applications. We expect them to use the definitional differences and ambiguities associated with the term "basic science" to promote their interests. Moreover, we are certain that their intelligence services will exploit any agreement, as they have in the past, to acquire militarily significant US scientific know-how and technology. The Soviets know that their ability to satisfy their objectives will depend not just on how the terms of cooperation are defined, but also on how an agreement is implemented and its activities are subsequently managed.** [redacted] 25X1

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This typescript was prepared by [redacted] Office of Soviet Analysis, and [redacted] Office of Scientific and Weapons Research. Comments and queries are welcome and should be directed to the Chief, Defense Industries Division, SOVA [redacted] 25X1

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## Background: Bilateral S&T Cooperation During the 1970s

At the May 1972 Nixon-Brezhnev summit in Moscow, highlighted by the signing of the SALT I Treaty, the US and USSR concluded an Agreement for Cooperation in the Fields of Science and Technology that covered a broad spectrum of activities in the basic and applied sciences. This agreement was one of 11 bilateral agreements signed between the two countries in the early 1970s that provided the framework for expanded exchanges in various areas of science and technology (see table 1). During the 10 years in which the S&T Agreement was in effect, more than 1,000 US scientists participated in more than 400 organized activities, and some 3,000 publications resulted from these exchanges.

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**Table 1**
**Areas of Cooperation under the 1972 Scientific and Technical Cooperation Agreement**

| | | |
|---|---|---|
| Physics | Microbiology | Chemical Catalysis |
| Forestry | Water Resources | Computers in Management |
| Metrology | Science Policy | Electrometallurgy |
| Corrosion | Polymer Sciences | Heat and Mass Transfer |
| Earth Sciences | | |

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Expanded S&T cooperation under these bilateral programs became a centerpiece of US-Soviet relations, a symbol of detente, and a central element in Moscow's drive to obtain Western know-how, technology, and credit to help modernize the Soviet economy. The high point in bilateral cooperation was the rendezvous and docking of the Apollo and Soyuz spacecraft in 1975.

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Shortly thereafter, cooperation began to fade with the cooling of the political climate and mounting US concern over the problem of the potential transfer to the Soviets of US technology. Soviet intelligence services were exploiting the bilaterals to gain access to and

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acquire militarily significant scientific know-how and technology . Participation in exchange programs also declined as indignation over human rights abuses in the USSR (treatment of dissidents, restriction of Jewish emigration, curbs on scientific freedoms) became an issue within the American scientific community. In reaction to the Soviet invasion of Afghanistan in 1979, Soviet complicity in the imposition of martial law in Poland, and the KAL incident, the United States terminated (or allowed to lapse) several cooperative programs. The United States then did not act to renew the basic S&T Agreement when it expired in 1982. As a result, the level of joint S&T activity fell and by the autumn of 1983 stood at less than one-fifth of what it was in 1979. The number of formal agreements dropped from 11 to seven.

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US reviews of the exchange programs point to positive results for both sides in almost all scientific fields. However, there was also a general concern that the Soviets had not always lived up to the spirit of the agreement. Reciprocity was lacking in terms of access to Soviet facilities and qualified scientists. Overall, the distribution of benefits from the agreement was heavily weighted towards the Soviet Union.

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As a consequence of the general understanding on exchanges reached by President Reagan and General Secretary Gorbachev at the Geneva and Reykjavik summit meetings, interest in improving scientific cooperation has been rekindled. Over the past two years, new cooperative programs have been initiated, and some old ones have been revitalized. More importantly, the Gorbachev regime has taken some steps to address what had been a major stumbling block from the US perspective: the human rights issue. Although many factors contributed to the sharp decline of cooperative efforts during the late 1970s and early 1980s, the arrest and internal exile of Academician Andrey Sakharov in 1980 was the final catalyst in the demise of official US cooperation in S&T. His recent release is one signal that Moscow now is eager to resume increased bilateral scientific exchanges.

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On 5-6 October 1987, the United States and the Soviet Union held exploratory talks in Moscow on a new intergovernmental basic science agreement (not to be confused with the agreement between the US and USSR academies of sciences). The Soviet delegation was led by officials of the State Committee for Science and Technology and included representatives from the USSR Academy of Sciences. The topics proposed by the Soviets lead us to believe that they are pursuing a mix of economic, military and scientific objectives.

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## Soviet Objectives for a New Agreement in Basic Sciences

Gorbachev is pursuing a new agreement to raise the quality and productivity of Soviet science and make it competitive with the West. Whereas the previous agreements were based on a narrow perspective of "modernization on the cheap" with emphasis on technology transfer, the present approach to an agreement reflects a commitment to revitalizing the Soviet S&T establishment itself and then using this sector as a catalyst to modernize the Soviet economy (see table 2). We believe the Soviets also hope that a new round of scientific exchanges with the United States will enhance their military capabilities, advance basic science, and improve Gorbachev's domestic and international reputation.

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**Table 2**
**Soviet Proposed Topics for Bilateral Cooperation**

| | | |
|---|---|---|
| New Materials | Corrosion | Catalysis |
| Welding | Membrane Technology | Industrial Lasers |
| Biotechnology | S&T Information | Theoretical Physics |
| Mathematics | Biology | Physiology |
| Chemistry | Heat Engineering | Earth Sciences |
| Technologies based on New Physical Principles | | |

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**Support Economic Modernization.** Moscow's main objective for this cooperation agreement is, in our opinion, to focus activities on applied areas that are critical for rapid S&T advance. Indeed, the Soviet delegation's entering position during the October discussions was that cooperation should be both in basic science and in applied technologies--as was the case under the original S&T cooperation agreement. Furthermore, many of the topics proposed by the Soviets center on areas in which--by their own admission--the USSR appreciably lags behind the United States. Gorbachev has made faster scientific and technological progress the linchpin of his economic revitalization program. Such an agreement would support Gorbachev's strategy to use science to help modernize the economy and meet the technological challenge of the West. Because of Gorbachev's S&T policy and strategies, we believe the Academy of Sciences and the State Committee for Science and Technology (GKNT) will be under tremendous pressure to push the boundaries of cooperation and avenues of activity into applied areas (see box). The continued efforts of the Soviet delegation during the October 1987 talks to press for applied topics, despite ostensibly agreeing to US insistence on basic research, tends to confirm our suspicions.

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**Reorientation of Soviet Science**

*The whole Soviet scientific establishment, including the Academy of Sciences--the principal performer under the proposed agreement--is being restructured and reoriented towards more applied research and new technology development. The Academy of Sciences, although still the nation's leading performer of basic research, is becoming increasingly more applications- oriented. Within the Academy, departments have been created and institutes reorganized or created to specialize in machinebuilding processes, automation, and computer sciences.*

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*applied R&D now comprises 40 to 50 percent of the Academy's total work.*

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Also indicative of Soviet intentions was their proposal that research be conducted under the auspices of interbranch scientific and technical complexes (MNTKs, to use the

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Russian acronym). As new national-level organizations, the complexes are charged with spearheading the development of many critical new technologies. Their responsibilities span the research-to-production cycle. Basic research is not the primary, much less the sole, focus of their mission. The inclusion of these complexes under an agreement would serve to steer cooperation towards applications-oriented research.[1]

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**Enhance Military Capabilities.** The Soviets are also keenly interested in pursuing research areas and deriving scientific benefits that could have possible military applications. Many of their proposed topics focus on dual-use technologies and on research areas that could improve Soviet defense production capabilities or weapons system designs. Some of the MNTKs that would head cooperative efforts are known to have ties to the defense industries, or include institutes that conduct research under contract for the military. While the Soviets will undoubtedly try to exploit any agreement to enhance defense capabilities, we do not believe this is the primary force behind their negotiations. To acquire sensitive scientific information and COCOM-controlled technology, they will more likely rely on an already aggressive programmed collection effort and well-established acquisition mechanisms

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**Advance Basic Science.** There is genuine Soviet interest in negotiating an agreement to advance basic science, but we do not believe that this is Moscow's primary objective. Under Gorbachev there is heightened concern about the status and direction of Soviet basic science. There is a new appreciation of basic science as the source for fundamentally new technologies. Moreover, Gorbachev is determined to bring Soviet science up to world levels. As one way to overcome its deficiencies, the USSR is expanding its foreign S&T cooperative efforts. Through an agreement with the United States, the Soviets also hope to refurbish their international prestige as a world leader in basic research. They also seek to better monitor trends and capabilities in US basic science. The Soviets have traditionally

[1] We note that complexes exist–but were not identified–for several topics tabled by the Soviets.

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used such information to develop forecasts and prioritize their own scientific efforts in both civilian and military areas. Their dependence on such information was illustrated in a recent Soviet press article which emphasized that they had fallen behind the West in membrane technology--an area proposed by Moscow for cooperation--because its researchers did not have access to what was going on in the West and therefore were not able to draw up realistic forecasts.

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**Obtain Political Benefits.** General Secretary Gorbachev would like very much to obtain a scientific cooperation agreement with the United States during the remaining period of the Reagan administration, when the two countries are making progress on arms control and other bilateral issues. An agreement on scientific exchange with a President who has made denial of military-related technology to the USSR a fundamental element of his foreign policy would help gain suppport for Gorbachev's foreign policy program among conservative elements in the Kremlin. Gorbachev probably also sees the process of negotiating such an agreement as a means of enhancing his image as a world leader interested in peaceful cooperation. Moreover, he would like to use an agreement and the improved political climate to increase access to the influential US scientific community.

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## Soviet Concerns

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published statements by Soviet political and scientific leaders indicate that they strongly favor a new round of scientific exchanges with the United States. At the same time, there is good evidence suggesting that they also worry about the possible costs of resuming cooperative activities. Based upon the experience of the 1970s, they are probably approaching a new agreement with a sense of pragmatism and

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caution. From Moscow's perspective, the results of the past agreement were not all positive, nor did they fully yield the expected benefits. In general, Soviet concerns likely focus on at least four issues:

- Continuing technological dependence on the West.
- US access to the Soviet S&T complex .
- Potential science/technology loss.
- Possible defection of Soviet scientists.

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**S&T Dependence on the West.** Although the Gorbachev regime has emphatically stressed that Soviet scientists be supplied information on Western scientific advances, there is a concern that this scientific interaction can reenforce Soviet dependence on the West. The leadership is worried about scientific and technological mediocrity and unneeded mimicry, and Gorbachev has warned that catching up with the West should not be interpreted as copying the West. By allowing Western trends and standards to dictate Soviet S&T forecasting and determine future avenues and priority areas for research, Moscow fears relegating itself to permanent second place in developing new areas of science and technology. During his April 1986 visit to East Germany, Gorbachev called upon "scientists, designers, and inventors to stop looking at average levels as the guidepost...abandon the position of imitation, and direct your efforts at developing and producing fundamentally new products that will be the best in the world." Party Second Secretary Yegor Ligachev in a November 1985 speech similarly criticized Soviet scientists for following the tracks of foreign researchers, emphasizing, that "it is impossible not to see that while we go for what is considered new today, others move further ahead and away at the same time.... This immediately predetermines a technological lag."

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**US Access to Soviet S&T Complex.** Moscow knows that the United States obtains access to institutions and scientists and learns a good deal about Soviet scientific

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capabilities through the exchanges. US participants gain information on specific research projects, experimental results, and how Soviet R&D is organized and managed.

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**Possible Defection of Soviet Scientists.** The Soviets are clearly leery about the opportunities for defection or recruitment of Soviet researchers. They protested loudly in December 1984 when Artem Kulikov, an Academy nuclear physicist, defected while on an extended research visit to a US laboratory under the auspices of an exchange agreement. As a result, the regime pushed for US assurances that such incidents would not be allowed

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to reoccur under future cooperative programs. 25X1

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Under the new arrangements, whenever a top Soviet scientist is invited to visit the United States, he will be accompanied by a second scientist selected by the Soviets. 25X1

## Moscow's Net Assessment

The Soviet leadership almost certainly believes that the gains from a new agreement significantly outweigh the potential losses, given the USSR's technological lag. They would clearly prefer an agreement that encompasses applications-oriented research, because this is where they are weakest and can obtain more immediate benefits. Nevertheless, in October the Soviet Union reluctantly accepted the US approach to restrict cooperation to basic science, reflecting their strong interest in an accord. Even within such a framework Soviet leaders probably calculate that they can secure significant gains. 25X1

Indeed , during the recent exploratory talks the Academy of Sciences' foreign relations chief announced plans to double or triple the volume of scientific exchanges with the US National Academy of Sciences. Moreover, based on the perceived political benefits, the Gorbachev leadership might enter into a basic science agreement even before substantive areas are defined.[2]

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[2] The 1972 S&T Agreement was signed without specifying in advance the range of topics. 25X1

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At the same time, the Soviets are likely to seek to push the boundaries of cooperation toward basic engineering and industrial applications. We expect them to use the definitional differences and ambiguities associated with the term "basic science" to promote their interests. The Soviets know that their ability to satisfy their objectives will depend not just on how the terms of cooperation are defined, but also on how an agreement is implemented and its activities are managed. We expect that Moscow will try to maximize its access to key US scientific information and institutions. While obviously concerned about US access to unique Soviet facilities and sensitive locations--a major sticking point in past exchanges--Moscow may be more flexible on this issue. The Gorbachev regime's new flexibility along these lines, already evident in the draft arms control agreement, may portend their willingness to ease US concerns over reciprocity.

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National Security Council and White House

Mr. Kenneth de Graffenried
Director, Intelligence Programs
National Security Council
Room 381
Old Executive Office Building

Commander Walter Doran
Office of the Vice President
Room 294 Old Executive Office Building

Mr. Fritz Ermarth
National Security Council
Room 368
Old Executive Office Building

Colonel Robert Linhard
National Security Council
Room 380
Old Executive Office Building

Dr. Tyrus Cobb
National Security Council
Room 361
Old Executive Office Building

Mr. Sven Kraemer
National Security Council
Room 380
Old Executive Office Building

Mr. William H. Courtney
Deputy ExecutiveSecretary
National Security Council
Situation Room
White House

Robert Dean
Special Assistant for International Programs
and Technical Affairs
National Security Council
Room 348
Old Executive Office Building

Michael Marks
Office of Science and technology Policy



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State

Mr. Thomas Simons
Deputy Assistant Secretary of State for
European and Canadian Affairs
Room 6219
Department of State

Mr. Mark Parris
Director, Office of Soviet Union Affairs
Bureau of European and Canadian Affairs
Room 4217
Department of State

Maj. Gen. Williams F. Burns
Deputy Assistant Secretary for Politico-Military Affairs
Room 7325
Department of State

Mr. Richard Solomon
Chairman, Policy Planning Council
Room 7311
Department of State

Mr. Philip G. Hughes
Deputy Assistant Secretary
Bureau of Politio-Military Affairs
Room 7327
Department of State

Mr. Robert K. German
Director, Office of Analysis for the Soviet
Union and Eastern Europe
Bureau of Intelligence and Research
Room 4758
Department of State

Mr. William Dean Howells
Director, Office of Political-Military Analysis
Bureau of Intelligence and Research
Room 6510
Department of State

Mr. Edward McSweegan
OES/SCT
Room 4330
Department of State



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Dr. John Dardis
INR/PMA
Room 6638
Department of State

Frederick Monroe
INR/PMA
ROom 6638
US Department of State



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Defense

Dr. Darnell Whitt
Intelligence Adviser to Under Sedretary of Defense
for Policy
Room 2E812
Pentagon

Dr. Andrew Marshall
Director, Office of Net Assessment
OUSDP
Room 3A930
Pentagon

Brig. Gen. Lee A. Denson, Jr.
Deputy Director for International Negotiations
Office of the Joint Chiefs of Staff
Room 2E1008
Pentagon

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CIA Rep NMIC
Room 2D901-A
Pentagon

Dr. Stephen Bryen
Director, Defense Technical Security Administration
Room 2E518
Pentagon

Walter Earle
Defense Technology Security Administration
Room 1C469
Pentagon

Frank Sobieszczyk
OUSDR&E (R&AT) Room 3E114
Pentagon

Lt. General Leonard H. Perroots
Director, DIA
Room 3E258
Pentagon

Lt. Gen. WIlliam Odom
Director
National Security Agency
Fort Meade, MD



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Dr. Wynfred Joshua
DIO for European and Soviet
Political/Miltary Affairs
Defense Intelligence Agency
Room 2A520
Pentagon

Mr. James McCrery
DIO for Strategic Programs
AND R&D
Defense Intelligence Agency
Room 2A520
Pentagon

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Asst. Deputy Director for Current Intelligence
DIA/JS1
Room 1C912
Pentagon

[redacted] 25X1

Assistant Deputy Director for S&T Intelligence
Room RCM-2E
DIAC
Pentagon

[redacted] 25X1

Room 150
DIA/DT-5B



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Commerce

Vincent DeCain
Deputy Assistant Secretary for Export Administration
c/o Office of Intelligence Liaison
Room H6854
US Department of Commerce

Dr. Surendra K. Dhir
OTPA
c/o Office of Intelligence Liason
Room H6854
US Department of Commerce

Chief, Office of Intelligence Liaison
Room H6854
US Department of Commerce

Other

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Office of Foreign Intelligence
Department of Energy
DP 432 GM111
Forrestal Building

Gerson Sher
Division of International Programs
Room 1214
National Science Foundation

Dr. Frank Press
President
National Academy of Sciences
2101 Constitution Avenue, NW
Washington, D. C.



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