

state & society

US physicists protest in response to Orlov sentence

In response to the trial and subsequent sentence imposed on high-energy physicist Yuri Orlov, a variety of protests by US physicists occurred in the days that followed. These included cancellation of a trip to Moscow for a condensed-matter symposium, postponement of a tour of nuclear-physics institutes in the Soviet Union, cancellation of individual trips to the Soviet Union by Robert Marshak and Nicolaas Bloembergen, a message sent by Norman Ramsey as president of The American Physical Society and a message sent by the directors of the six US high-energy physics laboratories.

Orlov is an accelerator expert who had been working on large storage-ring projects at the Physical Institute in Yerevan. He is a corresponding member of the Armenian Academy of Sciences. He became interested in monitoring Soviet compliance with the human-rights provisions of the 1975 Helsinki Agreement and moved to Moscow, where he became active in publicizing violations of the Agreement. In February 1977 he was arrested. Concern over his fate mounted in the physics community. For example, shortly afterward, 200 high-energy physicists throughout the US and Europe sent a message to Anatoly Logunov, vice-president of the USSR Academy of Sciences (PHYSICS TODAY, May 1977,



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page 112) expressing concern.

On 18 May of this year, Orlov was sentenced to seven years in prison and five years of internal exile. When news reached the US, reaction was swift.

Condensed-matter symposium. On 20 May, a US National Academy of Sciences delegation to the VII Joint US-USSR Symposium on Condensed-Matter Theory to be held in Moscow 22-26 May was scheduled to leave for Moscow. The

delegation's co-chairmen, William Brinkman of Bell Labs and Elihu Abrahams of Rutgers University, polled the 19 members of the group still in the US and Western Europe to see if they wanted to leave for Moscow the next day. The twentieth member, David Pines (University of Illinois), who is chairman of the NAS committee on US-USSR cooperation in physics, was already in the Soviet Union. Brinkman, recalling his feelings that day, told us, "We want to keep the interactions going. Soviet solid-state theorists are very good and we want to meet with them. But the timing appeared singularly bad."

On 19 May, Brinkman and Abrahams cabled I. M. Khalatnikov, director of the Landau Institute of Theoretical Physics, saying: "It is with great distress that we have to cable to tell you that our entire delegation has been profoundly affected by this week's events in Moscow connected with the trial of Yuri Orlov. We feel strongly about the rights of our fellow physicists and are distressed by the lack of openness in Orlov's trial and the severity of his punishment. There is a strong conviction that the present atmosphere has made useful scientific discussions impossible. We regret deeply that we will not have the fruitful exchanges

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Deutch wants more DOE support for university research

When the Department of Energy officially began operations last October, the Office of Energy Research, reporting directly to the Secretary of Energy, was formed within it. To gain some idea of the research priorities established by OER in its first few months of existence, PHYSICS TODAY recently talked with its director, John M. Deutch, in his Washington office. He discussed with us the respective roles that should be played, as he saw them, by the national laboratories and the universities in carrying out the department's R&D activities. Deutch also told us that he hoped to fund in the FY 1980 budget a university-sited DOE Research Institute.

Deutch, who received his PhD in

chemistry from MIT in 1965, worked as a systems analyst in the Office of the Secretary of Defense and as a postdoctoral fellow at the National Bureau of Standards before joining the chemistry faculty at Princeton University in 1966. Four years later he returned to MIT, where he eventually became chairman of the chemistry department. A physical chemist, Deutch has research interests in liquids, transport processes and polymer theory. He is a member of The American Physical Society and is vice chairman of the Defense Science Board.

Universities and national labs. It has recently been alleged that funding by DOE for basic research would increase at the universities, but that this would come at

the expense of the national laboratories. Deutch responded to the allegation by first noting the reasons for supporting basic research in the national laboratory system. First of all, basic research is a necessary underpinning to the laboratories' more applied technology programs. Secondly, it supports major facilities (such as neutron sources or synchrotron-radiation sources) at the laboratories that are available to the entire community (including universities and industry). Finally, there is a desire to maintain the excellence of the basic-research effort at the laboratories.

The first two reasons come from the special relationship of the national laboratories to DOE, but Deutch insisted that

an "honest and open" competition between the laboratories and the universities should take place in the third area, "without any special advantage for the national laboratory system."

Deutch admitted that he favors seeing a greater amount of research support go to the universities. He pointed out, however, that the greater emphasis by DOE on universities that some may have sensed is taking place not at the expense of the laboratory system, but rather from an effort "to allow the universities to profit from the more-than-usual growth that we are having in our basic energy sciences program."

Within the FY 1980 budget Deutch hopes to establish some DOE research facilities on university campuses. A strong possibility is the establishment of some university coal-research laboratories. Another possibility is the establishment of a university-sited Research Institute; he explained that "it would be in a specific area, but the area that would be selected would depend upon the quality of proposals that come in from the universities."

Relevance. Having heard from some people that there was strong pressure to show "relevance" in research supported by DOE, we asked Deutch for the department's attitude on this subject. He told us that it is "a very broad one that is certainly not established on a project-by-project basis, but rather on fields that are pertinent to energy technology or to environmental effects of energy."

"While we might very well choose to emphasize fields such as geophysics or geochemistry relative to, let's say, radioastronomy, because of relevance to the energy mission, we don't require, nor would it be wise in my judgment to require, statements of relevance from individual project grants. We choose to seek to select excellent proposals in pertinent fields."

High-energy physics. Because of his position, Deutch was recently called upon to testify about DOE's R&D efforts before House and Senate authorization and appropriations subcommittees. His greatest difficulty appears to have come in defending the department's high-energy physics program. Deutch admitted that the terminology of high-energy physics (for example, quarks and their possible characteristics such as truth, beauty, charm, strange, up and down) had made it more difficult to communicate to the congressmen the accomplishments of this field than others. He insisted, however, that the skeptical attitude displayed by some congressman was not generally shared by most of their colleagues, and as evidence, told us that there were indications that Congress would add funds to the high-energy physics budget.

Deutch also argued that it would not be in the best interests of the high-energy physics community to have research in



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the field primarily supported by some other agency, such as the National Science Foundation, as some people have suggested. Deutch cited several reasons: "First of all, we have long historical experience [through DOE's predecessor agencies, AEC and ERDA] in dealing with major projects—particularly large construction projects—which NSF does not have. We have sustained experience dealing with major laboratories that NSF does not have. And quite frankly we have a better budgetary history than NSF has." DOE presently supports about 90% of US high-energy physics research.

Nuclear physics. DOE supports nuclear-physics research under three separate programs. Two of them are basic-research programs (nuclear physics and nuclear sciences), and the other is in the energy technology area. According to Deutch, "nuclear sciences [in the basic energy-sciences program] is concerned with research on the nucleus at lower energies, production of isotopes, new techniques for cross-section measurements, instrumentation, and all aspects of nuclear physics that bear, from a research point of view, on fusion and fission technologies."

"The nuclear-physics program is concerned with medium- to high-energy nuclear physics and with the operation of the major research accelerators." Deutch told us that this last program could use an additional \$10 to \$15 million for operation of its existing facilities. DOE at present supports this program at a \$90-million level.

Deutch insisted that the long-range budget prospect for high-energy physics (about \$300 million in constant dollars) and nuclear physics (about \$105 million in constant dollars, if the aforementioned increase for facility operations were to be approved) is "a floor rather than a ceiling; in other words, one might do better . . . Depending on whether I can convince the Department and the Office of Management and Budget, they may go higher."

Other programs. The basic energy-sci-

ences program is expected to grow 10 to 20 percent in the foreseeable future, according to Deutch. He told us that within this program he would like to see an even greater growth in geosciences, engineering, applied math and computational sciences, and in all scientific activities that bear on solar energy. The proposed FY 1979 budget for the basic energy sciences program is \$211 million.

Deutch was also very enthusiastic about the Advanced Technology and Assessment Program. Under the program, if Congress approves, two activities, advanced technology projects (\$11 million) and assessment projects (\$6 million) will be funded for the first time in FY 1979.

Deutch told a Senate subcommittee that "The essence of our approach with Advanced Technology Projects is to identify and support novel and innovative research and development, of a high-risk nature, that does not fit within the current objectives of other Department programs." Areas that would be allocated funding in FY 1979 include laser photochemistry, tribology, small-scale combustion of coal, energy storage, accelerator breeder and neutron accountability/proliferation. Projects being considered for future funding include advanced fusion concepts, novel approaches to improving motor-vehicle performance, superconducting electric generators, thermoelectric and other means of using low-grade heat; and novel means of hydrogen production.

The assessment projects derive from Deutch's statutory responsibility to assess all DOE R&D programs for balance, gaps and duplication. These assessments will be done through mechanisms such as studies, workshops and special analysis teams. The department is currently planning to assess items such as non-conventional solar technologies, alternative fusion concepts, advanced isotope separation and geophysical techniques for resonance characterization.

DOE's first assessment of a solar energy technology is expected to be done through funding of The American Physical Society study of solar photovoltaic research. An evaluation of DOE's magnetic and laser fusion programs has been made by an ad-hoc experts group established by Deutch and headed by John S. Foster (TRW). DOE's entire basic-research activities have also been examined by a group organized by the President's Office of Science and Technology Policy and headed by Solomon J. Buchsbaum (Bell Labs).

A third activity within ATAP is the Non-Proliferation Alternative Systems Assessment Program. It was begun in early 1977 as a result of concerns expressed by Presidents Ford and Carter about the nuclear power fuel cycle. In the FY 1979 budget \$6.3 million (including \$4 million from OER) has been allocated to fund technical studies and generic as-

assessments of alternatives to this cycle.

Organization of OER. Deutch has five divisions working under him. There are separate ones for the basic energy-sciences program and for the high-energy and nuclear-physics programs. James Kane heads both of these, although the latter is only in an acting capacity.

Toni Joseph handles OER's field coordination of various laboratories; Joel Snow directs the research policy division, which handles technology assessment projects, interagency science and technology affairs, and the space solar power satellite program, among other things; and Roger LeGassie heads a group that deals with the R&D program issues that are assigned to Deutch.

Deutch pointed out that "My principal job is to be technical adviser to the Secretary, the Under Secretary, and the Deputy Secretary. They hand me assignments constantly to assist in formulating policy in the R&D area on such items as nuclear waste management (which occupies the greatest bulk of my time), fusion, solar R&D and on other such things."

Advisory committees that assist Deutch and his superiors in their policy formulations include the long-standing High-Energy Physics Advisory Panel and the newly formed Nuclear Science Advisory Committee (PHYSICS TODAY, February 1978, page 77). The latter advises both NSF and DOE, which provide nearly equal support in this field. As for HEPAP, Deutch said that he found it "incredibly useful in helping me understand the needs of high-energy physics and how best to go about meeting these needs under realistic budget strengths."

Deutch told us that Secretary of Energy James Schlesinger is expected to establish shortly an Energy Research Advisory Board (nominally housed in the OER) that will give broad external technical advice to the department on all aspects (not just on basic research) of its energy R&D programs. Deutch indicated that it may have subgroups working on a continuing basis in nuclear physics, climatic impact on increased production of CO₂, photovoltaics and other areas.

Some people have alleged that committees such as HEPAP and NUSAC have greatly lessened the technical assistance and advice that the National Academy of Sciences has traditionally provided to various federal agencies. Deutch disputed this allegation and mentioned several studies (on radioactive waste management, on climate and on nuclear alternatives) that NAS is currently doing for DOE.

He also carefully described the respective roles that NAS and advisory committees such as HEPAP and NUSAC should, as he sees it, play: "When we have an advisory committee that is concerned with the composition and direction of a granting program, in my mind it is

both more effective and more appropriate to have that advisory committee report directly to the agency. The NAS would be better for studies either in depth in a specific area (for example, climate, effects of CO₂) or for an ongoing technical survey of the field (for example, radioactive waste management.)" —CBW

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with our Soviet colleagues which have been the highlights of previous symposia, but the 19 members of the delegation still in the West have voted unanimously that we should not participate in a joint US-USSR symposium at this time. We hope that the near future will bring further scientific exchanges, as we value our past scientific interactions and friendships."

The next day, Brinkman and Abrahams reached Pines in Moscow. Pines, Abrahams and Brinkman expressed the hope that the cancellation would not jeopardize making plans in the fall for a condensed-matter joint research group meeting in the Soviet Union in 1979.

Other members of the US delegation were Michael Cross (Bell Labs), Victor Emery (Brookhaven), Michael Fisher (Cornell), Bertrand Halperin (Harvard), Leo Kadanoff (Brown), James Langer (Carnegie-Mellon), Patrick Lee (Bell Labs), Thomas Lubensky (University of Pennsylvania), Kasumi Maki (University of Southern California), Gene Mazenko (University of Chicago), N. David Mermin (Cornell), William McMillan (University of Illinois), David Nelson (Harvard), Raymond Orbach (UCLA), Joseph Sak (Rutgers), Douglas Scalapino (University of California at Santa Barbara) and Michael Stephen (Rutgers).

Individual trips. Bloembergen, who is a professor at Harvard and a member of the National Academy Council, had been scheduled to visit the Soviet Union as part of the exchange program between the US National Academy and the Soviet Academy of Sciences. On 19 May, Bloembergen cabled A. P. Alexandrev, president of the Soviet Academy, cancelling his visit and elaborated his reasons in a letter mailed that day, which said in part, "As stated in my telegram, the decision to cancel my scheduled visit is based on the fact that a closed trial has been held and a Soviet court has imposed a maximum sentence on physicist Yu. F. Orlov, corresponding member of the Armenian Academy of Sciences. This action deliberately defies and violates the Helsinki Agreement on Human Rights. The concern of many Western scientists about the fate of Orlov, as well as of Ginzburg and Shcharansky, has been expressed repeatedly during the past year through official and private channels. While I realize that the Soviet Academy of Sciences has no political control over these

matters, the complete silence and lack of response of your office to the expressions of concern by Western scientists has been conspicuous. I urge you to give these matters your most serious attention, as the closed trial of Orlov has dealt a severe blow to the cause of free scientific exchange..."

That same day, Robert Marshak, particle theorist and president of the City College of New York, cabled Logunov, formerly director of the Serpukhov high-energy laboratory, "Closed trial and inhuman punishment imposed on our high-energy physics colleague, Yuri Orlov, make it impossible for me to attend seminar on gauge field theories next week. I especially regret necessity of this decision since I planned to help celebrate Academician Markov's 70th birthday. I remind you that I reopened scientific exchanges between our two countries in 1956 when Markov attended the Rochester high-energy physics conference. I am hopeful that atmosphere will improve sufficiently that such cancellations can be avoided."

A tour of nuclear-physics institutes scheduled to occur in the Soviet Union 24 May-7 June was postponed by the delegation headed by D. Allan Bromley (Yale). The visit, sponsored by the Joint Coordinating Committee on Research on Fundamental Properties of Matter, headed by James S. Kane (US Department of Energy) and I. V. Chuvilo (director of the Institute for Theoretical and Experimental Physics in Moscow), was postponed at Bromley's request after Kane, on 22 May, cabled Chuvilo, "In view of the recent events connected with the trial of Soviet physicist, Yuri Orlov, ... [the delegation] has unanimously decided to postpone their trip. I concur in this decision and deeply regret the necessity for this action."

The next day, the delegation (consisting of Bromley, Herman Feshbach of MIT, Gerald T. Garvey of Argonne, Earl Hyde of Lawrence Berkeley Laboratory, O. Lewin Keller of Oak Ridge and Joseph Weneser of Brookhaven) wrote a letter to the directors of the institutes they had planned to visit, including Alexandrev as director of the Kurchatov Institute in Moscow, explaining their action. They said, in part, "It is a fact—an unfortunate fact, but nevertheless a fact—that the atmosphere of good will has eroded as a result of events in your country with the consequence that individual American physicists have progressively become more reluctant to become involved in joint programs involving our two countries. ... American physicists are reacting against a pattern of actions on the part of your government, which they view as repressive, exemplified most recently by the Orlov case. This reaction has now reached an intensity such that we, as individual members of the US nuclear-science community, have decided that it would not be possible, at this time, for us