Science and Technology Policy Towards the Islamic World
Brookings Institute Workshop
Washington, D.C.
January 4, 2005

John Marburger
Director, Office of Science and Technology Policy
Executive Office of the President

Thank you for inviting me to speak this morning in this overview session on "Science and Technology in U.S. Policy towards the Islamic World." Let me say at the outset that the White Paper on this topic prepared by Brookings Science Fellows Michael Levi and Michael d'Arcy is an excellent summary and analysis of the issues. The paper's strategy recommendations seem quite reasonable and consistent with the overall policies of this Administration. Since the two Michaels have done all the work, and you have the paper before you, and I agree with it, my best strategy at this point is to sit down and give over the rest of my time to them. That would probably violate some protocol of Washington workshops, and I hate to think of the consequences. So I will use this time to make some general remarks relevant to the topic. I have five points.

First, "The Islamic World" is not a useful category when thinking about science policy, and may even be counterproductive. That "World" is no better defined than "The Buddhist World" or the "New World," and the collection of Islamic countries, about 60 by the definitions of the White Paper, is extremely diverse in almost every dimension except religion, and always has been. U.S. policy is not based on religious orientation, and federal programs typically do not identify nations or groups of nations by religion. In particular there is no defined "U.S. Policy towards the Islamic World" in which we can search for science and technology components. To American ears the phrase "Islamic World" smacks of an artificial stereotyping that undermines the notion that people should be judged by their individual merit, and not by any accident of heritage or culture. The two Michaels acknowledge the stunning heterogeneity of the countries in this artificial category, and move on quickly to a region-by-region assessment that is very useful. The problems of greatest interest in these countries from the point of view of science policy are problems of development and capacity building, not of religion. Indeed, the White Paper can be read as an overview of science and technology in foreign policy for developing countries in general, with the Islamic countries providing case studies across a wide spectrum of conditions.

At some level of abstraction an Islamic world view does exist, and it does have some bearing on how the faithful think and learn about science and technology. The history of technical accomplishment in Islam has many positive aspects, however, and does not suggest great obstacles to be overcome for successful international collaborations. The U.S. currently enjoys many such collaborative science initiatives in Islamic countries, and seeks more.

Second, part of U.S. policy in the current Administration is to unleash the power of private enterprise and the resourcefulness of private individuals to achieve national objectives.

This is particularly relevant to foreign assistance. America is unusual, if not unique among nations in the willingness of private persons and organizations to contribute to causes that help others around the world. An op-ed by the Hudson Institute's Carol Adelman in last Tuesday's New York Times reminds us that in 2000 Americans helped people abroad "through private charities, religious organizations, foundations, corporations, universities and money sent to relatives" to the tune of "more than $35 billion, more than three times what the government gave. And this does not include giving by local churches or by overseas affiliates of American corporations."

There are good reasons to include private sector initiatives in a general discussion of science and technology aspects of foreign policy. Quoting Carol Adelman again: "Private giving is usually faster, nimbler and more directly accountable than government aid. Overhead costs are lower, and it can better avoid interference by corrupt officials." The White Paper does review private sector activity, but I think it merits even more attention. For example, the U.S. higher education establishment provides substantial direct and indirect support to foreign S&T development through programs and direct assistance to individual students and faculty. These efforts need better documentation and analysis, especially in view of their sensitivity to visa and export control policies, about which I will say more in a moment.

Third, it is worth asking why the United States should ever invest in science and technology in other nations. This is a practical question to which the tax-paying American public deserves an answer. That so many Americans and American enterprises volunteer such investments suggests that the public does support government investments too, but the justification for spending public funds should be as explicit as possible. Foreign policy is crafted to serve national interests, and it is possible to frame our justifications in terms of specific interests, which I will now do. These are not "official" policies, but rather my attempt to identify the self-interests that underlie the large and diverse set of programs we sponsor.

Societies support science for two reasons: it is intrinsically worth pursuing as a basic human endeavor, and it is useful. International collaborations make science more productive in both aspects eventually for all people everywhere. In particular, the United States supports international research and development to achieve one or more of the following ten national objectives.

1. To maintain and continually improve the quality of U.S. science by applying global standards of excellence. (Performing to the highest standards.)

2. To provide access by U.S. scientists to the frontiers of science without regard to national borders. (Access to the frontiers)

3. To increase the productivity of U.S. science through collaborations between U.S. scientists and the world's leading scientists, regardless of national origin. (Access to talent)

4. To strengthen U.S. science through visits, exchanges, and immigration by outstanding scientists from other nations. (Augmentation of human capital)

5. To increase U.S. national security and economic prosperity by fostering the improvement of conditions in other countries through increased technical capability. (Security through technology-based equity)

6. To accelerate the progress of science across a broader front than the U.S. may choose to pursue with its own resources. (Leveraging on foreign capabilities)

7. To improve understanding by other nations of U.S. values and ways of doing business. (Science diplomacy)

8. To address U.S. interests of such global nature that the U.S. alone cannot satisfy them. (Global support for global issues)

9. To discharge obligations negotiated in connection with treaties. (Science as a tradable asset)

10. To increase U.S. prestige and influence with other nations. (Science for glory)

These objectives apply to initiatives in countries at all levels of development. I offer them here as a reminder that science and technology investments differ from humanitarian aid. That does not mean we are always looking for a short term *quid pro quo* for our assistance. We understand that in many cases the positive benefits to the U.S. are indirect, long term, and difficult to measure. Making these benefits explicit will help the case for funding them, and help us weigh their value in competition with other national objectives.

The fourth point I wish to make is that other policies do exist that can prevent us from investing in foreign S&T, even when one or more of the Ten Objectives would be met. We are very concerned about the proliferation of weapons of mass destruction, so concerned that we are willing to give up some benefits of international collaboration if that is what it takes to achieve non-proliferation objectives. This particularly affects the development of nuclear technology in selected countries even for peaceful purposes. Of all the countries of interest in this Workshop, Iran offers the best example of a conflict between potential benefits from increased collaboration and the very high priority we place on non-proliferation.

We are very concerned about terrorism, even to the point of declaring war against it. States that condone terrorism or harbor terrorists are treated differently in our policies from other states, and our science and technology relations with those states are consequently also affected. Unfortunately, terrorist groups notoriously include members who are trained in science and engineering, and this has raised concerns in Congress and elsewhere about the eagerness of American institutions to offer technical training in any field to all comers. We currently address these concerns by attempting to filter the pool of applicants for student and scientific visas. The process as it stands is inefficient, offensive to some, and causes anxiety in science and education communities here and abroad. The resulting tensions will be with us for a long time, and will certainly be a central topic of discussion and policy activity for the foreseeable future.

And we are very concerned about trade in armaments and related technology. To quote from the Arms Export Control Act, “It shall be the policy of the United States to exert leadership in the world community to bring about arrangements for reducing the international trade in implements of war and to lessen the danger of outbreak of regional conflict and the burdens of

armaments. United States programs for or procedures governing the export, sale, and grant of defense articles and defense services to foreign countries and international organizations shall be administered in a manner which will carry out this policy." This leads to export control regulations that, like the visa screening process, create further anxiety in the science and education communities. Here too there is unresolved tension that will undoubtedly play a role in future policy activity. Dealing with these security concerns and balancing them against the benefits of international collaboration is extremely difficult.

Which brings me to my last point. It is much easier to make and offer policy advice than it is to implement it. U.S. science and technology activities are highly dispersed throughout government and non-governmental sectors, and many actors participate in a complex process that funds and manages S&T programs. Within the federal sector the R&D pot now exceeds $130 billion, and the half of that which goes for non-military science and technology is disbursed through nearly a dozen agencies. Of these, however, only a handful consume more than five percent of the non-defense R&D budget: NIH (47%), NASA(16%), NSF(10%), DOE(9%), and DOD(9%). USDA has three percent. Among the smaller agencies are the critically important NIST and NOAA operations in Commerce, the US Geological Survey in Interior, and the free-standing Environmental Protection Agency. Of all these, only NSF has no internal competition for its science budget. All the others share the department or agency allocation pie with significant non-science missions. Each has its own budget examiner who participates in a complex White House budget process managed by the Office of Management and Budget. Within Congress, ten of the thirteen appropriations committees fund science and technology, and in none of these is science a large fraction of their portfolio. To fund a policy initiative, consensus must be achieved first within the department or agency, then within the White House, and finally within Congress. Even after budgets are funded, programs are sensitive to the skills and interests of individual program managers and investigators.

Such complexity presents a daunting challenge to coherent policy implementation. General U.S. science and technology policy coordination is conducted through a well-defined interagency process managed by the Office of Science and Technology Policy under the aegis of the National Science and Technology Council (NSTC). The Council is often effective in forming an Executive Branch consensus on priorities and the assignment of responsibility for programs, but it has no direct authority over the agencies or the budget process. OSTP acts as an advocate for the NSTC consensus view within the White House policy machinery and leads advocacy on Capitol Hill for programs that emerge with approval from this process.

Funds for science and technology programs, both domestic and international, flow through the agencies, primarily the "big five." International programs are nearly always coordinated with the State Department, but the larger agencies act with a considerable degree of independence in their domains of science. For example, NASA interacts closely with international counterpart agencies on a more or less continuous basis, and NIH houses a unit, the Fogarty Center, devoted exclusively to international programs. The Department of State can create programs through its own resources, primarily through its Bureau of Oceans and International Environmental and Scientific Affairs (OES), but generally assists and helps to shape the international science agendas of other agencies. OES, for example, has a program directed toward Muslim countries, too recent to be included in the White Paper inventory. The

Agency for International Development (USAID) has a great deal of discretion over its programs, and is an important resource for implementing strategies such as those recommended in the White Paper.

U.S. funding and administration of science and technology have always been decentralized to mission agencies, and that is unlikely to change in the foreseeable future. But the departments and agencies work together far more effectively than the table of organization would suggest. The coordinating mechanisms of the White House operate continually to keep agencies in touch with each other and with Administration policy, and a series of Presidential documents, particularly the President's budget request to Congress, provide a roadmap each year for Executive Branch operations. Policy advice needs to accommodate this machinery to be effective. As you deliberate and form conclusions, please keep in mind that a practical path forward is an important part of any policy, and that requires linking to the actual processes and limitations of government.

These are my thoughts in response to the worthy theme of this workshop. Thank you once again for inviting me to speak.