REMARKS BY GEORGIA TECH PRESIDENT G. WAYNE CLOUGH
National Academies' Committee on a New Government-University Partnership for Science and Security, June 5, 2006

It is a privilege and a pleasure to welcome all of you to Georgia Tech and to Technology Square. We are honored to host this Southern Regional Meeting of the National Academies' Committee on a New Government-University Partnership for Science and Security, together with Emory University and the Southeast Regional Center of Excellence for Biodefense and Emerging Infections.

It is not a new or unique experience for Georgia Tech and Emory to collaborate; we do it every day. Georgia Tech has one of the nation's most highly rated engineering programs, and Emory has an outstanding medical school. So we pooled our assets and became partners in a biomedical engineering program that to our knowledge is the only joint academic program between a public and a private university in the nation. It is one of the nation's leading biomedical engineering programs, and includes two national centers of excellence – in the engineering of living tissues and in nano-medicine, especially as it relates to the diagnosis and treatment of cancer.

The Southeast Regional Center of Excellence for Biodefense and Emerging Infections is the new kid on the block. It was formed in 2003 by a group of research universities at the initiative of Duke University, and focuses on translational research designed to provide vaccines, medicines, and diagnostic tests for emerging and re-emerging infectious diseases that could be potential tools in hands of bioterrorists. And we are pleased to have the center join us as a co-host for this meeting.

Three years ago in 2003, I celebrated the 200th anniversary of the historic cross-country journey of Meriwether Lewis and William Clark by taking a boat trip up the Columbia and Snake Rivers, retracing part of their trip. And as we went, I read their journal. That trip helped me understand the rich heritage this nation has of exploration, discovery, and risk taking. Beginning with the earliest pioneers, Americans have always looked for new frontiers and imagined a better future.

Today, instead of the geographic frontiers Lewis and Clark explored, our new frontiers lie in the realm of science and ideas. But the process of exploration, risk taking, and discovery is just as essential to our future as a nation in the 21st century as it was when Thomas Jefferson sent Lewis and Clark on their journey in 1803.

I have the privilege of serving on the President's Council of Advisors on Science and Technology. And the same year I took that boat trip commemorating the 200th anniversary of the Lewis and Clark expedition, I also served on a PCAST panel that looked at the Science and Technology of Combating Terrorism. That panel was a reminder that many of the fundamental characteristics that drive exploration and discovery have the potential to be at odds with homeland security. Even as our future prosperity depends increasingly on scientific exploration and discovery, we are facing the need to re-balance freedom and risk-taking on the one hand against national security on the other.

Fundamental research, which in the United States is conducted primarily at universities, thrives in an environment of openness and collaboration. National Security Decision Directive 189 from back in the 1980s recognized that, saying, "No restriction may be placed on the conduct or reporting of federally funded fundamental research that has not received national security classification."

However, after the terror attacks of September 11, 2001, the federal government began to tighten restrictions on federally funded research, and the number of complaints from universities began to grow. Which brings me to a third thing that happened in 2003 – the American Association for the Advancement of Science conducted a study on these new restrictive clauses.

What they found was that in some cases universities decided to forego federal money altogether rather than accept restrictions. MIT, for example, turned down more than $400,000 in federal funding for their Artificial Intelligence Lab because it would have required the federal government to approve all employees. However, in most cases, universities have responded by engaging in a negotiation process to modify the language to be more acceptable. And in most cases, these negotiations have delayed the start of the research projects.

The AAAS wasn't the only organization raising a red flag. AAU and COGR also weighed in, stressing that university research is based on a free exchange of knowledge, and unless it was classified, fundamental research conducted by universities should remain unrestricted.

The federal government spends $25 billion a year on university research. These funds are distributed by a wide range of agencies and departments, including NASA, the NIH, NSF, NRC, DARPA, NIST, and the Departments of Energy and Agriculture – to name a few. Some of these agencies and programs have been taking the initiative – or have felt they are required – to add new restrictions to their research contracts. These restrictions might include a designation that the research is sensitive but unclassified, or that foreign nationals are restricted from participating. The Department of Homeland Security, responding to security concerns for its research activities, has also joined the fray with restrictions specific to its research.

There are too many cooks stirring this stew, and what it boils down to is that there is no consistent policy. What the Department of Energy finds acceptable today, the Department of Homeland Security may find objectionable tomorrow. What NSF considers legitimate may be unacceptable to NASA. Rather than having a reasonable, workable policy that is consistent across the board, research universities are put in the difficult and cumbersome position of enforcing different sets of restrictions and constraints for different research contracts. And research universities were gratified to read in last Wednesday's Federal Register that the Department of Commerce has acknowledged the concerns raised in more than 300 comment letters from people like me and modified its proposals for additional restrictions regarding deemed exports.

At the Georgia Tech Research Corporation, we basically have two tracks for administering research contracts – classified and unclassified. And while we have tried to work out difficulties with restrictive clauses, it is creating problems. Constraints that must be imposed on unclassified projects that have unusual restrictions attached to them, mirror many of the restrictions that must

be imposed in managing classified research. In addition, when a funding agency imposes a restriction on the use of foreign nationals in the research, we are forced to exclude students from those projects, which is detrimental both to the student and to the Institute.

I have heard representatives of the federal government articulate their conviction that nations who do not wish us well are placing graduate students and faculty at our universities in order to take advantage of the opportunity to work on sensitive research to the benefit of their home countries. And I do not doubt that there is truth in that statement. But at the same time, we also need to face the reality that if the United States adopts a bunker mind-set and cuts itself off from the international community of academic research and researchers, we will be the losers.

Back in the days when the threat of the Cold War was looming ominously over us, we essentially had this same discussion, and we realized the folly of isolating ourselves at that time. This time around, the penalties for cutting ourselves off will be even harsher. What happened with satellites during the 1990s is illustrative. The United States used to have the world market cornered on launching satellites, but as other nations developed their own technological capabilities, the world simply by-passed us and did it themselves when we made it too difficult and cumbersome for them to work with us.

Part of the reason the United States emerged as the world's undisputed leader in science and technology during the 20th century was that, through no effort or intents of our own, we became a magnet for the world's best talent. One of the unintended consequences of the political events of the day was that a disproportionate number of the world's brightest minds were looking to escape Nazism in Germany, or the rising tide of communism in the Soviet Union, or the lack of opportunity caused by poverty, war, and political instability in other parts of the world. And they came to the United States of their own volition.

Today both Nazism and the Cold War are gone, and nations like India, China, and Russia are upgrading their universities and increasing economic opportunity at home. At the same time, the United States has made it more difficult for bright students and academics to obtain visas. Those who still manage to come here are handicapped by deemed export policies. If they no longer feel welcome here, where will they go? Who will have the benefits of their talents if not the United States?

America has a rich heritage of entrepreneurism that propelled us to the forefront as the most prosperous and powerful nation in the world, but it is growing clear that the rules have changed. Tom Friedman's book, *The World is Flat: A Brief History of the Twenty-first Century*, describes the leveling of the global economic playing field, which is threatening the economic leadership the United States has enjoyed since World War II. A vast web of information technologies now interconnects the world, and anyone with a computer and Internet access can be an instant player in the global economy. Rising technological competency in nations from Ireland and Finland to China and India means that skilled workers from anywhere in the world are only a mouse click away.

We are standing on the brink of a new industrial order with clear potential for the 21st century to be the age of Asia's economic ascendancy. Population demographics indicate that 20 years from

now, 56 percent of the world's population will live in Asia, compared to just 4 percent in the United States. As Friedman points out, even if only 10 percent of Chinese, Russians, and Indians become engaged in the global market, that is still more than the entire population of the United States. Already the number of cell phone users in China is greater than the entire population of the United States.

Nations like China and India are also deliberately investing in building world-class universities. Thirty years ago, the United States was conferring 54 percent of the world's Ph.D. degrees. The brightest and best students from around the world were attracted to our shores for graduate study, and many of them stayed because career opportunities here were better than at home. However, by 2001, our share of the Ph.D.s awarded worldwide had dropped to 41 percent, and China, which conferred virtually no Ph.D. degrees at all as recent as 20 years ago, now produces 12 percent of the world's Ph.D.s. Doctoral graduates in nations like India and China also have a growing range of opportunities for employment at home.

What's more, in China 40 percent of college students are majoring in engineering, compared to just 6 percent in the United States. Last year, 325,000 Chinese earned engineering degrees compared to fewer than 60,000 Americans. India and the European Union have also surpassed the United States in graduating engineers.

The global economy is moving at warp speed, and the development of new products is no longer a linear process, but involves interaction between R&D operations, manufacturing operations, and consumers. In an economy that is driven by innovation, the winners are those who are first to get new ideas to the market. And the companies with the competitive edge are increasingly the ones that can locate their research and manufacturing facilities close to each other, close to major research universities, and close to their growth markets all at the same time. As nations like China and India develop world-class universities and skilled workforces, high-tech corporations are moving their research and development facilities there. Microsoft's biggest R&D facility is not in Seattle, but in Beijing, China. GE's Jack Welch Research Centre in Bangalore, India, employs 2,500 scientists, and GE is building a $250 million medical facility in New Delhi.

In this new, highly competitive, global game, it would be unrealistic for the United States to think that we will continue to dominate the high-tech end of the economy as we have in the past. We will no longer have the world's largest technology market and technological workforce. Our wages and health care costs are higher than those of our global competitors. And we can expect to produce only one of every four or five major inventions. It will be difficult enough to compete in this environment without handicapping and isolating ourselves with any more restrictions than are absolutely essential.

Last January, I was privileged to attend the U.S. University Presidents Summit on International Education, convened by Secretary of State Condoleezza Rice and Secretary of Education Margaret Spellings. From the perspective of the two secretaries and President Bush, the focus of that summit was on student exchanges and the need for Americans to learn more foreign languages as a contribution to our nation's security. But for the university presidents who came to Washington for the summit, the foremost issues in our minds revolved around deemed exports and visas for international students.

We presidents who were there were pretty unanimous in what we want. We understand the importance of national security, and we want the federal government to build high walls around small places – to define clearly those specific matters that are absolutely essential to national security and protect them vigorously – but then to allow openness in all other areas.

For example, to define "nanotechnology" as a matter of national security is being far too broad and puts American competitiveness at risk. The U.S. government is spending a billion dollars a year for nanotechnology research, but so is the European Union. So is China. So is Japan. If the burden of compliance gets too high, the research will go to these other places. If the constraints on the best graduate students and faculty become too onerous, they will go to these other places. And the United States will be left behind as other nations overtake and pass us on their way to world scientific and technological leadership.

We clearly need to take a comprehensive look at the type and level of restriction that is truly essential for national security, and then forge a new agreement between universities and government on the balance point between openness on the one hand and security on the other as they relate to university research. So I want to thank the National Academies for taking the initiative to create the Committee on a New Government-University Partnership for Science and Security.

This is the second of three regional meetings to discuss the issues surrounding restrictive clauses in federal grants, the dissemination of scientific information, the handling of sensitive but unclassified information, and the management of biological agents in university research. The first was a few weeks ago at MIT, and the third will be later in the summer in California. And I join the National Academies in believing that these regional meetings are an important step in beginning the essential process of forging a new partnership between government and the nation's research universities that will serve our need for both science and security in the innovation-driven global economy of the 21st century.

Partnership with Pakistan Academy of Sciences Webinar on Covid19 and Open Science on 11 May 2020 Webinar on COVID19 in Open Science Press Release. Islamabad Statement for Action on Open Science). Regional Arab Ministerial Virtual Meeting for Science and Research on May 19th, 2020. Relay and support by UNESCO/TWAS Council. Revaluing Science in Latin America and the Caribbean in the Face of the Pandemic. Contact your university of choice to find the best way to apply for a state scholarship. Universityâ€™s International Office will respond to your detailed letter (university contact details can be found here). How to apply for a government scholarship. Find information about the selection of international applicants on the website Studyinrussia.ru. Announcement is also published on the websites of the Rossotrudnichestvo representation ("Appendix-1.pdf") or the Russian Embassy in your country ("Appendix-2.pdf"). Contact the united operator* in your country and get information Committee on National Statistics. Division of Behavioral and Social Sciences and Education.Â This study was supported by Contract No. DE-AT01-01DP00344 between the National Academy of Sciences and the U.S. Department of Energy. Any opinions, findings, conclusions, or recommendations expressed in this publication are those of the author(s) and do not necessarily reflect the views of the organizations or agencies that provided support for the project.