It is always a pleasure to visit with this group of outstanding Atlanta leaders, and I am honored that you periodically give me an opportunity to keep you posted on our endeavors at Georgia Tech. We are not only educating the technological workforce that Atlanta needs, but we are also working very deliberately as a driver of high-tech economic growth for metro Atlanta and Georgia. And I’d like to tell you a little about that today.

Within the past few weeks, Georgia Tech hosted two events on our campus that brought the nature of the global economy into clear focus. One was a visit by Tom Friedman, who wrote the book *The World is Flat: A Brief History of the Twenty-first Century*. And if you haven’t read it yet, I highly recommend it. The other was The Innovation Summit, which gathered business, education, and government leaders from around the South to begin the discussion of how we as a region can become more deliberate and focused about stimulating the innovation it will take to compete in the global economy.

Those two events are book-ends of what I want to talk to you about today. I begin with Tom Friedman, who described the leveling of the global economic playing field, which is threatening the economic leadership the United States has enjoyed since World War II. Information technologies now interconnect 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 mean that skilled workers from anywhere in the world are only a mouse click away. The United States is finding itself challenged by ambitious nations who are entering the innovation space with plans to knock off those at the top.

Craig Barrett, Chairman of Intel put it this way: “The U.S. is not graduating the volume of scientists and engineers, we do not have a lock on the infrastructure, we do not have a lock on the new ideas, and we are either flat-lining, or in real dollars cutting back, our investments in physical science and engineering. The only crisis the U.S. thinks it has today is the war on terrorism. It’s not.”

With the start of the new century, we are finding ourselves face to face with a new world. Population demographics indicated that by 2020, 56 percent of the world’s population will live in Asia, compared to just 4 percent in the United States. As Tom 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 have been deliberately investing in building world-class universities. The United States used to attract the brightest and best students from around the world to our shores for graduate study, and many of them stayed because opportunities were better here. Today, a growing number are studying at home. China now awards 12 percent of the
world’s Ph.D. degrees, up from zero 20 years ago, while America’s share has shrunk from 54 percent to 41 percent.

After they graduate, these Ph.D.s can get good jobs at home at the research and development facilities that high-tech corporations are increasingly building overseas. 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 CEO Jeff Immelt recently announced a $250 million medical facility to be built in New Delhi. Pharmaceutical giant Merck & Company has major research and development facilities in 11 nations.

Companies like these can hire five chemists in China and at least that many engineers in India for the cost of one equivalent in the United States. But lower wage scales are not the only attraction. These nations, with their emerging middle classes, represent the world’s largest technology markets. In an economy that is driven by innovation, the winners are those who are first to get new ideas to the market, and that makes it very attractive to locate your R&D operation close to a major research university that is in a major market.

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. 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. 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. How can we compete in this environment?

No nation, no region, no community, no business can compete against hungrier, highly educated, lower-cost global competitors by using the same old status quo products and methods. The trick is to cultivate the kinds of research, jobs, and industries that cannot be easily done elsewhere. And that requires us to be on the leading edge of innovation.

Last year I was privileged to co-chair the National Innovation Initiative of the U.S. Council on Competitiveness with IBM CEO Sam Palmisano. The Council defines innovation as I5, or the intersection of five I’s: ideas, imagination, invention, insight, and implementation. Innovation begins with research in science and engineering to generate the discoveries and inventions, then adds to them the ideas and insight that enables them to be implemented to solve problems, address the needs of society, meet market demand, and even create new markets.

Creating a fertile environment for innovation to happen requires some action from Washington – federal funding for research, policy changes on investment and intellectual property, updating our floundering health care system. But innovation itself happens in local communities and regions where the research is conducted and the workforce is educated, and inventions are transformed into marketable products and services. Innovation occurs in places that align their resources and provide opportunities for collaboration between and among universities, businesses, and governments.
That is why we convened the Innovation Summit for the South, bringing business, government, and university leaders from across the region to our campus to begin the discussion of how to generate innovation and position our region to compete in the new global economy. The Southern Technology Council is now carrying the discussion forward through its Southern Innovation Initiative, which will reach out to thousands more of the South’s leaders over the coming months. And if any of you have an opportunity to participate, I hope you do so. This effort will develop a regional report and action plan, which will be presented next June.

At universities like Georgia Tech, innovation is often triggered by open-ended conversations across the traditional academic disciplines that enable people to piece together their ideas, knowledge, and inventions in unique ways. For example, Mark Allen is an electrical engineering professor at Georgia Tech and a recognized expert in MEMS, which stands for micro-electro-mechanical systems. Mark used this technology to develop a tiny sensor to place inside the engine on an unmanned military drone aircraft. It monitors the air flow and turbulence in the engine and radios its measurements to a controller who is somewhere else on the ground. This technology helped make the successful use of drones possible in Afghanistan and Iraq.

Then Mark struck up a conversation with a doctor at a hospital in Cleveland who was looking for a solution to a problem that cardiologists have with patients who have congestive heart problems or stents inserted in their arteries. These patients need frequent monitoring, and the current technique is a CT-scan, which is not only expensive, but requires the use of a dye that is toxic to the kidneys. Pretty soon these heart patients develop kidney problems that keep getting worse with each CT-scan. The result of this unusual collaboration between an electrical engineer and a cardiologist has been the development of microscopic sensors that are either built into a stent or sent through the blood stream to lodge in a lung. Instead of a CT-scan, the doctor simply waves a wand in front of the patient’s body. The wand uses radio waves to activate the sensor, then picks up the readings it sends.

Mark is now the co-founder of a start-up company called CardioMEMS. The company’s first sensors began human clinical trials last year and should soon enter the market. This kind of interdisciplinary collaboration is at the heart of innovation.

Georgia Tech is both a critical resource for innovation and a driving force in making it happen. We provide the talent that innovation requires to conduct the research and make the discoveries and inventions, and then to deploy those ideas and inventions rapidly into the market.

A study done by McKinsey & Company in June of this year indicated that low-wage countries have 33 million young professionals who are university graduates with up to seven years of work experience compared to 7.7 million in the United States. But the McKenzie study also indicated that less than 15 percent of that young professional workforce in low-wage countries has the more sophisticated skills that enable them to be leaders. They lack language and communication skills. Their education focused on rote memorization and did not cultivate problem-solving or creative-thinking skills. They do not have any cross-cultural or teamwork skills.
By contrast, Georgia Tech not only gives its graduates a rigorous grounding in their disciplines, but we also give them a leg up over their international competition. Forty percent of our undergraduates participate in structured research activities, learning to think for themselves and solve open-ended problems. A third of our students study abroad, learning cross-cultural skills and becoming comfortable with diversity. We offer a variety of opportunities for our students to learn teamwork and leadership skills both inside and outside the classroom. And we are continually expanding our efforts to give our students skills and talents that corporations need but cannot get in other places.

We also conduct the research that stimulates innovation. Georgia Tech is the state’s largest university research engine, bringing hundreds of millions of research dollars into Atlanta from the federal government and private industry. We are a leader in cutting-edge interdisciplinary fields like applying nanotechnology to medicine through our unique multi-faceted bioengineering partnership with Emory University. This partnership is a major research engine that ranks third in the nation in federal funding from the National Institutes of Health. We have received more than $40 million in research funding for nano-medicine just within the past year or so, including most recently a $19 million nanotechnology cancer center.

Georgia Tech is also widely recognized as one of the best in the nation in moving our discoveries and inventions into the commercial market. A national survey by the Southern Growth Policies Board and a study commissioned by the state of Connecticut recently ranked Georgia Tech among the best in technology transfer and economic development. Just within the past two years, we helped spawn a remarkable 24 new companies – each with the potential to grow into the next technology giant. Many of them are in incubation at our Advanced Technology Development Center, which is not only the first university-based business incubator in the nation, but also widely regarded as one of the best.

We are now working on the next stage of the process, which is to provide space close to our campus for the companies that graduate from our incubator, as well as for other companies that want to locate close by. Just within the past several months, both Samsung and Pirelli located major broadband research centers at Technology Square, which extended our campus across the downtown connector and into the heart of the emerging Midtown Atlanta high-tech business community. And Pirelli brought its North American headquarters as well. We will continue with Technology Enterprise Park, which will soon be under construction on the southwestern edge of our campus near the new aquarium.

At Georgia Tech, we are working hard to drive innovation and help metro Atlanta and Georgia become a “hot spot” for innovation, because we know this is the only way we will prosper in the competitive environment of the 21st century. It will take a concerted effort to achieve that goal. But if the businesses and business organizations, the governments, and the universities of metro Atlanta all focus on innovation and bring our efforts into alignment with each other for maximum effect – together we can make it happen. And our children and grandchildren will inherit a prosperous future that is filled with opportunity.