The emergence of the Chinese economy is one of the greatest dramas of this twenty-first century. How about the science and technology and “Made in China”? From my own experience of visiting and closely working with colleagues in China over the past two weeks, the Chinese Science and Technology of China could be as world-famous as its merchandise.

Bearing in mind that the Gross Domestic Product of China expands at a rate of 10-15% every year, one will not be surprised to learn that research funds have grown by 30-40% in recent years. As noted in the March 11, 2011 edition of UCAR Magazine, “Funding at National Science Foundation of China (NSFC) has been growing from 0.11 billion Yuan (about $17 million USD) in 1986 to 8.3 billion Yuan (about $1.3 billion USD) in 2010. The agency’s budget is scheduled to continue growing at approximately 20% per year for at least the next few years.” Money talks! With such strong financial support, any science plan in China is achievable. Upper Atmosphere Research is no exception.

The upper atmosphere includes the atmosphere above the lower stratosphere. It influences weather near the Earth’s surface while being modulated by solar activities. Upper atmosphere research is essential for understanding the near space environment for satellites and spacecraft. However, China lagged behind its developed country counterparts in this field for many years.

Because I got my bachelor’s in Electrical Engineering in China, I was not exposed to the upper atmosphere research being conducted there. My whole knowledge of atmosphere and space physics was learned in the United States. I have always wanted to know more about the work my Chinese colleagues were doing in China, and luckily for me, that wish is coming to fruition. Fortunately, NCAR provides me with great opportunities to interact closely with visitors from China. We have hosted a number of visiting professors and scholars from the Chinese Academy of Science in Beijing, from the University of Sci-
Experiencing China (continued)

ence and Technology of China (USTC) in Hefei, and from other university departments. After they visited us, we were invited in turn to visit them, which made my recent trip to China possible.

My first stop was the Center for Space Science and Applied Research (CSSAR) at the Chinese Academy of Science in Beijing. CSSAR is the flagship of space physics in China. The group head of their upper atmosphere research division, Dr. Ji-yao Xu, was my host in Beijing. Jiya has a long history of collaboration with scientists from ACD and HAO. Our direct interaction was spurred by my visit to CSSAR last year. I gave a seminar there about my research on the observed large wind shear in the lower thermosphere based on my Ph.D. work. The upper atmosphere group showed great interest and discovered that their mesoscale numerical model was able to explore large wind shears in the upper atmosphere. From that interaction, a new topic of collaboration was initiated that included both Han Li Liu (HAO) and me. This time, while visiting with CSSAR’s upper atmosphere group, I worked closely with their graduate students and postdocs. Their endeavors in science are impressive. Even during weekends, the offices at CSSAR are often a full house. Over the past several years, the upper atmosphere research in China has transitioned from pure theoretical and modeling work to more field experiments and observations. With time and more research funding, Chinese researchers are now in the position to purchase or develop by themselves more state-of-the-art scientific equipment. A good example of this is a project named “Meridian space weather monitoring project” which is hosted by CSSAR and involves detecting means like sounding rockets, radio waves and optics. Worth mentioning is the fact that the upper atmosphere group purchased a Fabry-Perot Interferometer from HAO.

The next stop was the Space Physics Department, USTC, located in Hefei, Anhui Province, about 400 km away from Shanghai. Their upper atmosphere group there has two young faculty members, one of which, Prof. Xianghui Xue, visited HAO last year to collaborate with scientist Han-Li Liu in order to implement the inertial gravity wave parameterization in the NCAR Whole Atmosphere Community Climate Model (WACCM) to force the Quasi-Biennial Oscillation (QBO). The other young faculty member, Prof. Tao Li, graduated from the same research group as mine at Colorado State University. They are constructing two sets of sodium lidars, one broadband to measure sodium density and the other a narrowband lidar to observe neutral temperature and wind in the region of 80-105 km. The good news is that the department is about to get two more young faculty members both of whom are ASP Postdoc alumni. Jiu-hou Lei and Xiaoli Luan, will join their group next month. Because of their expertise on ionosphere and thermosphere, the research in the department extends from the upper stratosphere to solar activities. Startup funds for one selected “hundred experts project” supporting young scientists is two million Yuan, approximately 0.3 million U.S. Dollars. In other good news, and to further solidify the NCAR/USTC collaboration, the NCAR model, WACCM, now has been tuned and tested in their cluster computers.

As I’m typing these words, I’m traveling 200 km per hour on high speed rail. These types of high-speed trains that connect most of the big cities and provinces in China only emerged just a few years ago. Science and Technology in China seems to be on the same express track.
This year marks the 20th Anniversary of the NOAA Climate and Global Change (CGC) Postdoctoral Program. The goal of the CGC program is to train the next generation of climate researchers by pairing recent PhD graduates with host scientists at institutes across the US. The program has facilitated 166 appointments to date. This milestone was honored and celebrated by nearly half of the current and former postdocs on April 14-15 at the NOAA Auditorium and Science Center, in Silver Springs, MD.

The two-day symposium, emceed by Richard Somerville (Scripps Institution of Oceanography), served to highlight both the advances in climate science as well as the challenges. Research lectures by current postdocs and alumni underscored the ongoing contributions and breadth of research topics that the program supports. Each speaker was also asked to share strategies, successes, and difficulties that they have faced communicating their work. Dr. Gavin Schmidt (CGC Class 6), NASA climate scientist, urged scientists to increase efforts to bridge the gap between the technical literature and media headlines, including a suggestion to create a “real climate scientist profile” that would help the public to understand what we do and why we do it. Guest speaker Andy Revkin, Dot Earth blogger for the New York Times, suggested that when it comes to engaging the public and overcoming climate inertia, there may be a complementary role for social scientists, as well as additional opportunity for “experimentation” beyond traditional communication approaches (see dotearth.blogs.nytimes.com/2011/04/14/climate-communication-and-the-nerd-loop/). These talks and others sparked spirited discussions and debate on the role of scientists, which continued throughout the meeting and during the evening reception on Capital Hill.

The CGC program is funded by the NOAA Climate Programs Office, headed by Chet Kollinsky, and is administered by UCAR’s Visiting Scientist Program. Learn more at: http://www.vsp.ucar.edu/cgc/