

USTC: A Powerhouse of Talent

By Younan Xia* and Shuhong Yu*

We are greatly honored to assemble this Special Issue to celebrate the accomplishments of the University of Science and Technology of China, a research-oriented university better known as USTC in the scientific community. The reason is very simple; both of us received excellent education from USTC: Xia a B.S. in Chemical Physics in 1987 and Yu a Ph.D. in Inorganic Chemistry in 1998.

USTC is a national university located in Hefei, Anhui, a province that is probably known best for its world-famous Yellow Mountain or Huangshan (see the map). The University was founded in Beijing by the Chinese Academy of Sciences (CAS) in September 1958 and relocated to Hefei in 1970 during the Cultural Revolution. USTC was established in response to the urgent need for the national economy, defense construction, and education in advanced science and technology. Today, it remains the only university directed by the CAS, while all other universities in China are under the leadership of the Ministry of Education. Because of its unique connection with CAS, USTC has received profound supports from all (over 120!) of the research institutes of CAS since its founding. Currently, USTC comprises nine schools that encompass twenty three departments (mainly in science and



A portion of the Chinese map showing several major cities surrounding Hefei, where USTC is located. Hefei is approximately one hour away from Nanjing and three hours away from Shanghai by train and the flight time from Hefei to Beijing is only two hours. As a UNESCO World Heritage Site, Yellow Mountain (or Huangshan) is known for its scenery, sunsets, peculiarly-shaped granite peaks, pine trees, and views of the clouds from above.

engineering), together with a few special programs such as the Special Class for the Gifted Young and the Experimental Class for the Teaching Reform. It also operates graduate and professional schools in other major cities including Beijing, Shanghai, and Suzhou.

From the very beginning, USTC has been blessed with strong supports from the Chinese government, including the establishment of two national facilities on the campus: the National Synchrotron Radiation Laboratory (NSRL) and the Hefei National Laboratory for Physical Sciences at Microscale (HFNL). In fact, USTC is the only university in China that has two national facilities on the same campus. The newly established HFNL was formally approved by the Chinese Ministry of Science and Technology in November 2003. It was founded on a multidisciplinary approach, with a focus on both national strategic demands and

frontier basic research. Research at HFNL involves physics, chemistry, biology, materials science, and information technology in a highly integrated fashion. Currently, 153 research scientists (most of them are USTC faculty) and staff members work at HFNL. Major facilities include a low-temperature and strong-magnetic-field laboratory and a micro- and nanofabrication laboratory. In 2006, HFNL was selected as a research base for the “Quantum Research” national science megaproject. It has also been a leading institution or participant of three other megaprojects: “Nanoscience and Nanotechnology”, “Protein Science”, and “Development and Reproductive Biology”. HFNL enjoys worldwide fame and was recently selected as one of the Top Ten State Science and Technology Developments in the World.

Since its founding, the USTC has been persisting in fundamental research and enhancement of original capabilities of innovation, in order to accumulate strength and power for solving key issues in the scientific development of the nation. Over the past decade, the citation count per faculty member at the USTC is 8.23, among the highest for publications from all universities in China. According to the 2008 World University Rankings by Times Higher Education, USTC was ranked as the third top university in China and the twenty fourth top university in Asia. In the 21st century, USTC is expediting the establishment of a world-class research university from five major aspects, namely talent cultivation, faculty development, discipline construction, society service, and a modern university system.

USTC is probably known best for its high-quality students. The admission is very selective: more than 90% of incoming

[*] Prof. Y. Xia
Department of Biomedical Engineering
Washington University
St. Louis, MO 63130 (USA)
E-mail: xia@biomed.wustl.edu

Prof. S. Yu
Division of Nanomaterials and Chemistry
Hefei National Laboratory for Physical
Sciences at Microscale
Department of Chemistry
University of Science and Technology of
China
Hefei, Anhui 230026 (P. R. China)
E-mail: shyu@ustc.edu.cn

DOI: 10.1002/adma.201000203

A partial list of USTC alumni who hold faculty positions in the United States and whose research is closely related to materials science and nanotechnology.

Name	Major and Year	Current Institution	Research Areas
Stephen Y. Chou	B.S. in Physics 1978	Dept. of Electrical Engineering Princeton University	Nanofabrication, nanoelectronics
Jianping Lu	B.S. in Physics 1983	Dept. of Physics and Astronomy University of North Carolina	Carbon nanotubes
Shan X. Wang	B.S. in Physics 1986	Dept. of Materials Science & Engineering Stanford University	Magnetic nanomaterials, information-storage devices
Younan Xia	B.S. in Chemical Physics 1987	Dept. of Biomedical Engineering Washington University in St. Louis	Materials chemistry, nanomaterials, biomedical applications
Yushan Yan	B.S. in Chemical Physics 1988	Dept. of Chemistry University of California at Riverside	Zeolites, low-k dielectric materials, fuel-cell technology
Wenbin Lin	B.S. in Chemical Physics 1988	Dept. of Chemistry University of North Carolina	Supramolecular chemistry, porous materials, magnetic nanomaterials
Mingdi Yan	B.S. in Polymer Physics 1988	Dept. of Chemistry Portland State University	Surface chemistry, nanobiotechnology
Zhonghua Peng	B.S. in Geochemistry 1989	Dept. of Chemistry University of Missouri-Kansas City	Organic/inorganic hybrid molecular materials, polymer science
Zhengdong Cheng	B.S. in Chemistry 1990	Dept. of Chemical Engineering Texas A&M University	Complex fluids, colloidal materials
Shaowei Chen	B.S. in Chemical Physics 1991	Dept. of Chemistry University of California at Santa Cruz	Nanomaterials, electrochemistry
Shanhui Fan	B.S. in Physics 1992	Dept. of Electrical Engineering Stanford University	Metamaterials, nanophotonics
Peidong Yang	B.S. in Chemistry 1993	Dept. of Chemistry University of California at Berkeley	Materials chemistry, nanomaterials, nanophotonics, nanocatalysts
Chongwu Zhou	B.S. in Electric Engineering 1993	Dept. of Electrical Engineering University of Southern California	Nanotechnology, nanoelectronics
Jixin Cheng	B.S. in Chemistry 1994	Dept. of Chemistry Purdue University	Nanophotonics, optical imaging, bionanotechnology
Liangshi Li	B.S. in Chemical Physics 1994	Dept. of Chemistry Indiana University	Semiconductor nanostructures, hybrid solar cells
Ju Li	B.S. in Materials Science 1994	Dept. of Materials Science & Engineering University of Pennsylvania	Materials theory and modeling
Chris Li	B.S. in Polymer Science 1995	Dept. of Materials Science & Engineering Drexel University	Soft matter, hybrid materials, polymer science
Jiangeng Xue	B.S. in Physics 1995	Dept. of Materials Science & Engineering University of Florida	Organic semiconductors, solar cells
Rongchao Jin	B.S. in Chemical Physics 1995	Dept. of Chemistry Carnegie Mellon University	Materials chemistry, metal clusters, nanophotonics
Yugang Sun	B.S. in Chemistry 1996	Center for Nanoscale Materials Argonne National Laboratory	Nanophotonics, materials chemistry, solar cells
Jun Zhu	B.S. in Physics 1996	Dept. of Physics Pennsylvania State University	Carbon nanotubes, fullerenes
Xiangfeng Duan	B.S. in Chemistry 1997	Dept. of Chemistry and Biochemistry University of California at Los Angeles	Materials chemistry, graphene, nanoelectronics
Ying Wang	B.S. in Chemical Physics 1997	Dept. of Mechanical Engineering Louisiana State University	Nanomaterials, energy storage, solar cells
Yi Cui	B.S. in Chemistry 1998	Dept. of Materials Science & Engineering Stanford University	Nanomaterials, batteries, solar cells
Yadong Yin	B.S. in Chemistry 1998	Dept. of Chemistry University of California at Riverside	Colloidal science, photonic materials, nanocatalysts
Yiying Wu	B.S. in Chemical Physics 1998	Dept. of Chemistry Ohio State University	Materials chemistry, nanowires, solar cells
Wei You	B.S. in Chemistry 1999	Dept. of Chemistry University of North Carolina	Polymer synthesis, organic solar cells
Chen Yang	B.S. in Chemical Physics 1999	Dept. of Chemistry Purdue University	Nanomaterials, nanoscale devices
Yu Huang	B.S. in Chemistry 1999	Dept. of Materials Science & Engineering University of California at Los Angeles	Biomimetics, nanomaterials, nanoscale devices
Jiaying Huang	B.S. in Chemistry 2000	Dept. Materials Science & Engineering Northwestern University	Nanomaterials, graphene, self-assembly
Dunwei Wang	B.S. in Chemical Physics 2000	Dept. of Chemistry Boston College	Nanomaterials, energy conversion
Yue Wu	B.S. in Chemistry 2001	School of Chemical Engineering Purdue University	Nanomaterials, nanoscale devices

freshmen were ranked in the top 5% of their high school class and their scores for college-entrance examination were also among the very highest in the nation. The students of USTC have a strong reputation of being highly motivated and hardworking. For every 1000 students graduating from USTC, more than 700 will pursue a master or Ph.D. degree, and at least one of them will be later elected as a member of the Chinese Academy of Sciences or the Chinese Academy of Engineering. These two ratios are also the highest among all Chinese universities. With these statistics

in mind, it will not be difficult to understand why there are so many USTC alumni who are holding faculty positions in the western countries. The table provides a partial list of those alumni in the United States alone, whose research is closely related to materials science and nanotechnology. As limited by space, this special issue can only accommodate the contributions from ten USTC alumni, in addition to the contributions from six USTC faculty members (most of them also received their education from USTC).

It is hoped that this special issue will provide the readers some representative and exciting accomplishments contributed by USTC researchers or alumni to the field of advanced materials. We also sincerely hope that readers will enjoy the scope of topics presented here and perhaps take this opportunity to know more about our Alma mater.

Go USTC! We are all proud of you!