



The author at the Huazhong University of Science and Technology.

Courtesy of Barry R. Masters

Optics Shine in Wuhan, China

Barry R. Masters

China, the second largest economy in the world, is placing a growing emphasis on the development of science and technology. But behind its booming growth, the country is still rooted in the traditional values of family, respect for the elderly, and education. OSA Fellow Barry Masters describes his recent visit to the city of Wuhan and how the educational system there mixes Chinese traditions with Western influences.

Wuhan, the capital of China's Hubei province, is located at the confluence of the Yangtze and Han rivers, where it serves as the major economic, educational, cultural and transportation center in central China. Wuhan is home to the so-called "Optical Valley" (Guanggu), a technology cluster similar to Silicon Valley in the United States. The Valley is part of the Wuhan East Lake High-Tech Development Zone, which is noted for the presence of Yangtze Optical Fibre and Cable Company Ltd., one of the largest manufacturers of communication fibers, FiberHome, and the Wuhan Research Institute of Post and Telecommunications, one of the largest research institutes for optical telecommunications in China.

Wuhan is also home to 35 institutions of higher education, including Huazhong University of Science and Technology and the Wuhan University. There are eight national colleges and uni-



The author and students in front of a statue of Confucius on the HUST campus.

versities and 14 public ones in Wuhan. The campus of HUST is beautifully nestled at the foot of Yujia hill and beside the East Lake. It is a key comprehensive university under the direct leadership of the Ministry of Education of the People's Republic of China.

The university ranks at the top of China's leading universities in comprehensive strength. It has 46 academic schools and departments covering eleven disciplines: philosophy, economics, law, education, literature, history, agriculture,

science, engineering, medicine and management. HUST employs 12,611 faculty members, of whom more than 4,000 are full-time teachers, 24 are academicians of the Chinese Academy of Sciences and the Chinese Academy of Engineering, and more than 1,000 are professors. The number of resident students is more than 55,000, including 18,963 graduate students.

The Wuhan National Laboratory for Optoelectronics (WNLO) is located on the HUST campus. WNLO's interdisciplinary research platforms include fundamental photonics, integrated optoelectronics, micro-nano fabrication, lasers, optical networks and communication, information storage, terahertz optoelectronics, energy optoelectronics and organic optoelectronics, and biomedical photonics and optoelectronic medical devices. I visited several of the research laboratories and was impressed with the modern equipment as well as the quality of the research.

The Britton Chance Center for Biomedical Photonics

The Britton Chance Center for Biomedical Photonics (BCCBMP), a division of WNLO, is the first center in China that is devoted solely to the study of biomedical photonics. It was created in 1997 and named in August 2006 after Britton Chance, an American pioneer in the field of biomedical optics who passed away late last year. Scientists at the BCCBMP are exploring neuronal information processing mechanisms and developing new methods for diagnosing diseases and treating illnesses using photonic methods and technologies.

Research at the Center focuses on five areas: optical brain imaging and neuro-informatics, optical molecular imaging and systems biology, digital life and biomedical informatics, optical probes and nanobiophotonics, and multimodal biomedical imaging and tissue optics.

The BCCBMP currently has 29 faculty members, of whom there are two Cheung Kong Distinguished Professors of the Ministry of Education, 11 professors, six associate professors, 10 lecturers and two postdoctoral fellows. In addition, BCCBMP has 10 adjunct professors, two of whom are Cheung Kong Chair Professors of the Ministry of Education. The number of resident students is more than 100. The International Business and Scientific Advisory Board of BCCBMP is comprised of 25 distinguished members from academia and business fields all over the world.

Qingming Luo served as my host during my one-month visit to HUST. Luo is the director of the BCCBMP, the executive deputy director of WNLO, and the dean of the College of Optoelectronic Science and Engineering. I presented eight days of lectures in a graduate course on optical diagnosis and therapy and two public lectures—one in which I discussed how to work as a responsible scientist and another on the life of C.V. Raman. (I later had the opportunity to present the former lecture in Beijing as well, at the Peking University Health Science Center and Tsinghua University.)



Wuhan National Laboratory for Optoelectronics (gray and white buildings in the foreground).

Wuhan is home to the so-called “Optical Valley,” a technology cluster similar to Silicon Valley in the United States.

After all of my public lectures, I enjoyed engaging in extensive discussions. During my time at HUST, I toured the campus as well as the Institutes of the Wuhan National Laboratory for Optoelectronics, and I met with graduate students to discuss their research and assist them with their manuscripts.

One of the special aspects of the BCCBMP is that the professors conduct their work in the same room as their graduate students. This arrangement fosters a close interaction between teacher and student. Graduate students often work more than 60 hours in a six-day work week, and they form a cohesive community. Modern optical instruments are housed in the facility’s clean rooms, which exclude particles from the urban environment.

The work of BCCBMP researchers has been featured in *Optics Express* and *Optics Letters*. Recently, investigators at the Center also contributed a paper to *Science* on three-dimensional whole brain imaging.

My visit to HUST gave me an opportunity to interact with students and faculty. I shared the normative values and procedures of responsible conduct of research as well as my knowledge of biomedical imaging. Although I came to China to teach, I also learned much about Chinese culture and the wonderful educational and research institutions and programs in Wuhan. ▲

My visit to HUST was supported by 111 Project (No. B07038). I wish to thank the following people who were extremely kind and helpful to me: Ling Fu, Zhenli Huang, Hui Li, Xiaobao Liang, Qian Liu, Qingming Luo, Hua Shi, Nian Tian, Zemin Wang, Tianwu Xie, Zhe Yang, Jing Yuan, Shaoqun Zeng, Jie Shu, Ana Xie, Lingbing Zheng and Sichao Hou.

Barry R. Masters (brmail2001@yahoo.com) is a Fellow of AAAS, OSA and SPIE. He is a visiting scientist with the department of biological engineering, Massachusetts Institute of Technology, Cambridge, Mass., U.S.A., and a visiting scholar in the history of science department at Harvard University.

[References and Resources]

- >> HUST website: <http://english.hust.edu.cn/>
- >> WNLO website: <http://222.20.94.9:8083/>
- >> BCBP center website: <http://202.114.29.52/en/>
- >> B. Masters. “What I learned from Britton Chance,” Britton Chance Center for Biomedical Photonics: <http://202.114.29.52/en/news/vshow.php?uid=87>
- >> Peking University Health Science Center (PUHSC) website: www1.bjmu.edu.cn/e_bjmu2/index_e.htm
- >> Tsinghua University website: www.tsinghua.edu.cn/publish/then/index.html