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For IWU Professor, Math is a Global Experience

BLOOMINGTON, Ill.—So what does a professor do on a sabbatical, a semester-long leave from teaching?

If you're Tian-Xiao He, associate professor of mathematics at Illinois Wesleyan University, you deliver high-powered research papers at various campuses and international conferences, mingle with some of the world's top mathematicians, and swap information about cutting-edge math issues ripe for discussion next semester with IWU students. And, you carry out this three-pronged agenda in far-flung locales, spanning France, Japan, China, and the United States.

"It's about maintaining networks," He said, referring to his sabbatical travels. "I give talks in seminars and I do collaborative work. We discuss teaching and we share information for teaching and research.

"And, when I return to IWU," He added, "I'll be refreshed, reinvigorated, and I'll come back with plenty of new ideas."

Recent Travels

He's recent U.S. travels have taken him to Washington University in St. Louis, Vanderbilt University, University of Tennessee-Chattanooga, Georgia Institute of Technology, University of Central Florida, East Tennessee State University, and the University of Illinois/Urbana-Champaign.

His overseas itinerary includes stops at the University of Tokyo and the Fukuoka Institute of Technology in Japan, an international mathematics conference in St. Malo, France, and several campuses in China, including Jilin University and the Hefei University of Technology, He's alma mater. He was invited to several other universities, but had to decline the offers due to time constraints.

Mathematical Research Focus

He's topics range from research and applications of wavelet theory to approximation theory and computer-aided geometric design.

He's work in wavelet theory links pure and applied mathematics. Wavelet theory deals with things like image processing and compression. Image compression can have very practical applications, especially for an organization like the FBI, whose fingerprint files bulge with more than 25 million cards. Without some form of image compression, a sortable and searchable electronic database would be next to impossible.

This type of compression, He said, also can be applied to the transmission of photos from Mars and other planets by satellites exploring outer space.

Organized Wavelet Conference

Many experts in this field came to a conference organized by He for the American Mathematics Society (AMS) at the University of Illinois/Urbana-Champaign on March 18-21, 1999. The conference proceedings, edited by He, will be published next year.

"At meetings such as this one," He explained, "we discuss new topics and ideas—and like a family we share ideas."

He points out that many topics discussed at these meetings are so new they haven't made it to textbooks yet.

Travels to France, Japan

This month, He's passport will be stamped for France and the fourth International Conference on Curves and Surfaces, where he will make a presentation on approximation theory.

He is headed to Japan in August for the second conference of the International Society for Analysis, Its Applications and Computation—a group whose acronym, ISAAC, stands for Isaac as in Sir Isaac Newton (1642-1727), the famous English physicist and mathematician. He will speak at the conference on wavelet theory.

Cutting Edge of Math

He is used to being on the cutting edge of mathematics teaching and research. He is remembered in Chinese academic circles as the first Ph.D. student in approximation theory in his homeland.

He is the author of five books and about 60 papers and publications, including 15 research papers since joining the IWU faculty in 1991. He also reviews pieces for "Mathematical Reviews," a worldwide publication reporting on mathematical research.

He points out that this type of work is more commonly carried out at a research university—not in a liberal-arts setting like Illinois Wesleyan.

He's Background

He taught for nine years in China before joining Texas A&M University in 1985 as a research associate first in the Center for Approximation Theory, then in the College Station campus' Department of Ocean Engineering, and finally in its Department of Electrical Engineering. He also was a teaching and research assistant and assistant lecturer in A&M's Department of Mathematics.

He, who began college in 1972, earned bachelor and master of science degrees in mathematics from Hefei University of Technology and his first doctorate from Dalian University of Technology. He earned a second doctorate in applied mathematics from Texas A&M University in 1991, where he was named the Distinguished Doctor of the Year.

He, and his wife, Yulan Zhu, a nursing assistant at the McLean County Nursing Home, are the parents of Henry Huan, who is studying at Harvard University.

About IWU

IWU, founded in 1850, enrolls about 2,000 students in a College of Liberal Arts, and individual schools of Music, Theatre Arts, Art, and Nursing. Since 1994, these facilities have been added to the IWU campus: a \$15 million athletics and recreation center, a \$25 million science center, a \$6.8 million residence hall, a \$5.1 million Center for Liberal Arts, and a \$1.65 million baseball stadium.