

## Engineer Superstar, Joseph Wang, Joins UC San Diego's NanoEngineering Department at Jacobs School of Engineering

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Joseph Wang, the most cited engineer from 1991 to 2001 and consistently one of the world's most cited engineers and chemists, joined the faculty of the Department of NanoEngineering at UC San Diego's Jacobs School of Engineering this summer.

Wang's research expertise is vast and his publication list prolific. His work includes sensing technologies for applications such as clinical diagnostics, environmental and security monitoring and remote sensing; microfluidics; nanomachines for drug delivery; and the relatively new and rapidly growing field of nanobioelectronics, which is aimed at integrating nano- and biomaterials with electronic transducers. Wang's team recently made headlines around the world for research demonstrating nanomachines that are dramatically faster and stronger than any previously built.

"I'm excited to be joining the Jacobs School's Department of NanoEngineering. It is the first in the nation in terms of academics, and I have the unique opportunity to help build a department that will serve as a model for other nanoengineering departments around the country and the world," said Wang.

Wang is the author of over 750 papers and has collaborated with more than 100 visiting researchers from about 50 countries. He is the founder and editor-in-chief of the prestigious journal *Electroanalysis*.

Most recently, Wang was on the faculty at Arizona State University (ASU) and served as the Director of ASU's Center for Bioelectronics and Biosensors. He earned a D.Sc. in Chemistry from Technion, Israel Institute of Technology. At ASU, Wang authored 120 papers in four years. "I have been consistent in my research and publications for many years. We write papers the old fashioned way. We write, rewrite, and really think about the wording to ensure that our novel ideas are presented in a simple and clear manner."

### **Sensors, Nanotechnology and Beyond**

Wang began his scientific career as an analytical chemist, and some of his early work focused on electrochemical devices that served as field sensors. He made small sensors and portable instruments for continuous environmental monitoring or for near-patient biomedical diagnostics. Wang helped to develop Gluco-Watch, the first noninvasive biosensor for diabetes patients that monitored glucose levels through human sweat. Such developments have led to numerous national and international awards.

Wang's current sensor research encompasses environmental, industrial, security, surveillance and many other applications. In addition, some of his sensor research has moved into the realms of nanomaterials, including nanowire barcodes for tracking products or metal nanoparticles for amplified biodetection.

Wang's nanoscale research reaches well beyond nanosensors. Recent publications include work describing the operation of nanomachines that may one day deliver drugs.

"Nanomachines performing diverse nanoscale applications are our new babies. We started in this area about two years ago, and now we are one of the leaders in nanomotors and nanomachines," said Wang.

Wang's ties to San Diego run deep. He has worked with the U.S. Navy in San Diego for ten years on explosive detection and water quality monitoring research-including underwater detection of explosives using mechanical dolphins. Over the years, he has also collaborated with San Diego-based General Atomics researchers.

"I'm excited about collaborating with faculty members from many different departments and schools here at UCSD, and with companies in San Diego's rich biotechnology cluster. The intellectual environment here is very stimulating," said Wang.

Wang's instrumentation and microfabrication tools are housed at two laboratories in Engineering building II and three shared laboratories in the UCSD division of Calit2, including Nano3.

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