Lecture by Joseph Wang

October 16th, 2017

@ 11 AM

Room: OostHorst 111

(n.b.; this is not the Bergveldlecture; that one is planned at 3.30 PM in Waaier 3)

Nanomachines that Write, Image, Repair, Sense, Isolate, Deliver and Destroy

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The remarkable performance of biomotors has inspired scientists to create synthetic nanoscale machines that mimic the function of these amazing natural systems [1]. Creative research efforts across the globe have led to powerful and versatile man-made nanomachines. Significant improvements in the capabilities of these nanoscale machines have led to greatly enhanced speed and power, motion control, cargo-towing force, versatility, functionality and scope of synthetic nanomotors. The greatly improved capabilities of artificial nanomotors have paved the way to exciting and important new applications. Our team has recently described nanoscale machines capable of 'writing' (patterning) nanoscale features, repairing electrical circuits, perform high resolution imaging, generating energy, isolating cancer cells, detecting intracellular targets, or

sensing and neutralizing threats. These recent advances and new capabilities will be described, along with future prospects and challenges.

References:
1. J. Wang, “Nanomachines: Fundamentals and Applications”, Wiley, 2013.
2. J. Wang et al, “Nanorobots in Medicine: Delivery, Surgery, Sensing, and Detoxification”, *Science Robotics*, 2, eaam6431 (2017).

J. Wang- Biosketch

Joseph Wang is Distinguished Professor, SAIC Endowed Chair and Chair in Department of Nanoengineering at University of California, San Diego (UCSD). He is also the Director of the UCSD Center of Wearable Sensors. He served as the director of Center for Bioelectronics and Biosensors of Arizona State University (ASU) before joining UCSD. Prof. Wang has published more than 1000 papers, 11 books and he holds 12 patents (H Index=119, >61,000 citations). He received 2 American Chemical Society National Awards in 1999 (Instrumentation) and 2006 (Electrochemistry) and 4 Honorary Professors from Spain, Argentina, China and Slovenia. He became the most cited electrochemist in the world and received the 4th place in the ISI's list of 'Most Cited Researchers in Chemistry' in 1996-2006. Prof. Wang is the Editor-in-Chief of *Electroanalysis (Wiley)*. His scientific interests are concentrated in the areas of nanomachines and nanorobotics, wearable sensors, bionanotechnology, and bioelectronics.