

# Kolloquium

Am Mittwoch, den 30. September 2015, um 10:00 hält

**Dr. Wen Jung Li**

**Chair Professor of Biomedical Engineering at Department of Mechanical and Biomedical Engineering, City University of Hong Kong**

einen Vortrag mit dem Titel

## **Optically-Induced Electrokinetics: A Digital Path to Cancer Cell Manipulation, Patterning and Differentiation**

**Der Vortrag findet im Raum A1-3-330 statt.**

### **Abstract**

Optically-induced electrokinetics (OEK) has found many applications in biological and micro-/nano-scale manipulation, separation, and assembly in the past decade. In this lecture, OEK is envisioned as a fundamental technology that uses localized and real-time-reconfigurable (programmable) electric fields to enable rapid manipulation and assembly of entities ranging from molecular to micron-scale dimensions. We will demonstrate several applications related to cancer cell research using OEK, including 1) real-time assembly and patterning of cancer cells in hydrogels using OEK; 2) rapid and non-UV-based patterning of hydrogels to study the effects of mechanical stress on breast cancer cell growth; 3) inducing self-rotation of cells with rotational characteristics that are uniquely related to the electrical and mechanical properties of each type of cell; 4) differentiation of cells by their transient acceleration response under specific OEK force fields. We will also show the multiplicity of OEK applications by demonstrating other non-biological related results such as i) rapid fabrication of conductive polymer electrodes and nano-material sensing elements by electrokinetic forces; ii) single-step, non-UV-based, fast fabrication of micro lens arrays. Finally, we will also elaborate on many other anticipated applications for OEK in the coming few years.

### **Biography**

Dr. Wen J. Li received his BS and MS degrees (in aerospace engineering) from the Univ. of Southern California in 1987 and 1989, respectively, and his Ph.D. degree from the Univ. of California, Los Angeles, in 1997. He is currently Chair Professor of Biomedical Engineering in the Department of Mechanical and Biomedical Engineering at the City University of Hong Kong (CityU). Prior to joining CityU, he was with The Chinese University of Hong Kong, where he headed the Centre for Micro and Nano Systems. He held R&D positions at the NASA Jet Propulsion Laboratory (Pasadena, CA), The Aerospace Corporation (El Segundo, CA), and Silicon Microstructures, Inc. (Fremont, CA), before moving to Hong Kong in 1997. His research group has published over 300 technical papers since 1998 and has received numerous best conference paper awards from prestigious conferences such as IEEE-ICRA, IEEE/ASME AIM, IEEE-ROBIO, and IEEE-NANO in the past 15 years. Dr. Li served as the Editor-in-Chief of the IEEE Nanotechnology Magazine from 2007 to 2013, and was recently elected to serve as the President-Elect of the IEEE Nanotechnology Council in 2015, then as its President in 2016 and 2017. Dr. Li has co-founded (with his former students) 3 startup companies (in Hong Kong and China) which are currently commercializing MEMS and nano-sensor related products world-wide. He was elected IEEE Fellow in 2010 and ASME Fellow in 2011. He is a Distinguished Overseas Scholar of the Chinese Academy of Sciences (100 Talents Plan), and held honorary/affiliated academic appointments at the Shenyang Inst. of Automation (CAS), Peking Univ., The Chinese Univ. of Hong Kong, Huazhong Univ. of Science and Technology, Soochow Univ., Beijing Inst. of Technology, and Shenzhen Academy of Robotics.

**Eingeladen von: Prof. Dr. Sergej Fatikow**

*Weitere Kolloquiumstermine sind im WWW abrufbar.*