



**Centre for Biosystems Science and Engineering**

# **S E M I N A R**

**at 3.30 PM on January 5, 2016  
Seminar Hall, MRDG, Biological Sciences**

## **Surface-chemical Gradients and Patterns: Applications in Biology**

**Prof. Nicholas Spencer**

**Laboratory for Surface Science and Technology  
Department of Materials, ETH Zurich**

Functionalizing surfaces is a useful activity, in that it allows the ideal bulk properties to be combined with the ideal surface surfaces. A further step is to spatially control functionalization, either by patterning different surface chemistries, or by gradually changing surface chemistry, or indeed surface morphology or roughness, along a surface. Applications of patterning include biosensors and cell studies, while gradients can be used either to find particular surface conditions that lead to a particular biological outcome, or to induce specific behaviors of an organism on a surface. Methodologies for functionalization, patterning, and gradient fabrication will be discussed, as well as examples of their application.

### **About the speaker:**

Nicholas Spencer studied Surface Chemistry at University of Cambridge for his Ph.D. He worked at the University of California, Berkeley, on ammonia synthesis catalyzed by iron single crystals. Subsequently he joined W. R. Grace and Co., in Maryland, USA, carrying out research on catalysts, high-temperature superconductors, and novel analytical techniques. Since 1993 he has been Professor for Surface Science and Technology at the ETH Zurich, Switzerland, was Head of the Department of Materials for 6 years, and from 2007-2015 was President of the ETH Research Commission. He is an Editor-in-Chief of Tribology Letters, cofounder of the International Nanotribology Forum and Swiss Tribology, a Fellow of the Royal Society of Chemistry (UK), and a Member of the Swiss Academy of Engineering Sciences. His principal research interests include surface functionalization and characterization, tribochemistry, polymer brushes and gels, chemical and morphological gradients, as well as biointerfaces.