

MSE-Colloquium@NTU

3 May 2018, 2:00 pm

Lecture Theatre 5, Nanyang Technological University, Singapore



Electrochemical Energy Storage: From Materials Research to Battery Modelling

Professor Peter H.L. Notten
Eindhoven University of Technology
Honorary Professor, University of Technology
Sydney
International Adjunct Faculty, Amrita University

Abstract

An overview of the research carried out in the *Energy Materials and Devices* group will be given, addressing: (i) Fundamental materials research in the field of hydrogen and electricity storage; (ii) Introducing new energy storage technologies, such as 3D-integrated all-solid-state batteries; (iii) Mathematical modelling, description and experimental verification of the macroscopic behaviour of electrochemical and physical processes of these materials/devices; (iv) Design new algorithms based on insights offered by these models, such as safe and fast charging algorithms and advanced Battery Management Systems.

Biography

Dr Peter H.L. Notten joined Philips Research in 1975 until 2010. While working on the electrochemistry of etching III-V semiconductors in these laboratories, he received his PhD from the Eindhoven University of Technology in 1989. Since then, his activities have been focused on the research of hydride-forming (electrode) materials for application in rechargeable NiMH batteries, switchable optical mirrors and gas phase storage, and lithium-based rechargeable battery systems. Since 2000, he has been appointed as Professor at the Eindhoven University of Technology where he is heading the Energy Materials and Devices group. In 2014, he was appointed an International Adjunct Faculty at Amrita University, Coimbatore, India and Forschungszentrum Jülich, Germany. In 2018, he was appointed Honorary Professor at the University of Technology Sydney (UTS).

His main interests include the development of (i) advanced battery and hydrogen storage materials; (ii) new battery technologies; (iii) modelling of energy storage materials and complete rechargeable battery (NiMH and Li-ion) systems, and (iv) the development of sophisticated Battery Management Systems (BMS), enabling accurate and adaptive State-of-Charge and State-of-Health determination to be applied in electrical vehicles in connection to the Smart Grid. He is a member of the Editorial Boards of *Advanced Energy Materials* and *International Journal of Electrochemical Science*. He has published about 250 scientific papers and also contributes to scientific books, and owns about 30 patents.