



University of Hawai'i at Mānoa

## **Hawai'i Natural Energy Institute**

School of Ocean & Earth Science & Technology

# **Electrochemical Energy Storage: from Materials Research to Battery Modelling**

Portable energy plays a crucial role in our modern society. The use of wireless electronic equipment, such as mobile phones, laptop computers and electrical shavers has been rapidly growing during the last two decades and this growth should become even more pronounced in the near future. In addition, there is a strong tendency that “portability” will broaden, on the one hand, towards very small applications like wireless Autonomous Devices, and, on the other hand, to very large applications like (Hybrid) Electrical Vehicles (HEV). Some people, therefore, have declared the 21<sup>st</sup> century already as “*The Portable Age.*”

In order to provide all these applications with electrical energy, rechargeable batteries play an indispensable role. Furthermore, it is to be expected that fuel cells will be commercially introduced in the coming years. Modern rechargeable battery systems are almost all based on the safe storage of the smallest energy carrying ions: hydrogen and lithium (Li). Based on these concepts the most popular battery systems, Nickel-MetalHydride (NiMH) and Li-ion, have been developed. The underlying principles of these concepts will be outlined together with an overview of our research contributions, ranging from materials research to battery modeling. In addition, future trends will be discussed.

**Peter H.L. Notten**

Eindhoven University of Technology  
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**Monday, October 9, 2006**

**10:30 am to noon**

**POST 121**

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