

Doktorarbeit / PhD thesis

Hybrid solar batteries



At the Chair for Functional Materials at the Technical University of Munich, we investigate the physical basis of material properties using state-of-the-art scattering methods (neutron, X-ray, and light scattering) and spectroscopic techniques. The general goal of our research is to infer functional properties from knowledge of microscopic structure and dynamics.

We are looking for a PhD student to work on the project "In situ and operando probing of soft materials at buried solar cell interfaces". The salary is 1/2 TVL E13 for 3 years.

Information about the chair can be found at:

<https://www.ph.nat.tum.de/en/functmat/about-us/>

Topic: In a traditional approach, solar cells charge separately installed batteries. Towards a higher level of device integration, solar batteries unite a solar cell and a battery within one device, thereby effectively merging the functions of a solar cell and a battery into a single, lightweight, and sustainable system. The captured solar energy can thus also be used to supply electricity in the dark, enabling simple and portable off-grid applications. In the project on hybrid solar batteries, this new type of solar battery will be explored based on hybrid material approaches combining metal oxides and polyelectrolytes. Such a combination offers mechanical advantages over pure polymer materials to allow for flexible devices. Besides the solar cell and battery characterization, the device morphology will be studied with imaging and scattering methods. In combination with optical spectroscopy, this allows mechanistic insights into the long-term charge stabilization.

For further information, please contact Prof. Peter Müller-Buschbaum (muellerb@ph.tum.de).
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