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Institut für Physik
Institut für Chemie und Biotechnik

INSTITUTSKOLLOQUIUM

Gemeinsames Kolloquium der Physik und Chemie

Am Dienstag, dem **26. Mai 2026**, spricht um **17:15 Uhr** im **Faraday-Hörsaal,**

Herr PhD Tomás Neuman

FZU - Institute of Physics of the Czech Academy of Sciences, Prag

zum Thema:

"Principles and Applications of Light-Assisted Scanning Tunneling Microscopy of Molecules"

Abstract:

When a bias voltage is applied across a scanning tunneling microscope (STM) junction, not only tunneling currents but also light emission can be observed. The underlying mechanisms of this emission vary strongly between systems. In metal–insulator–metal junctions, light is typically generated via inelastic electron tunneling, whereas in molecular systems a more efficient pathway often involves sequential tunneling. In this process, the molecule is charged and discharged in successive tunneling events, eventually reaching an excited state that relaxes by emitting a photon.

In this talk, I will discuss the details of this sequential tunneling mechanism and show how it governs STM-induced electroluminescence. I will describe the relevant electronic states and the conditions controlling charging, discharging, and photon emission, and demonstrate how this mechanism leaves clear fingerprints in electroluminescence photon maps.

I will then turn to the reverse process—photocurrent generation—and show how the same framework can be used to interpret photocurrent maps.

Finally, I will present recent results demonstrating how this approach enables the detection of the electronic structure of an excited state of a molecular radical.

Wir laden Sie zu diesem Kolloquium herzlich ein!

Die Hochschullehrer der Institute für Physik und Chemie