

Großes Physikalisches Kolloquium an der Universität zu Köln

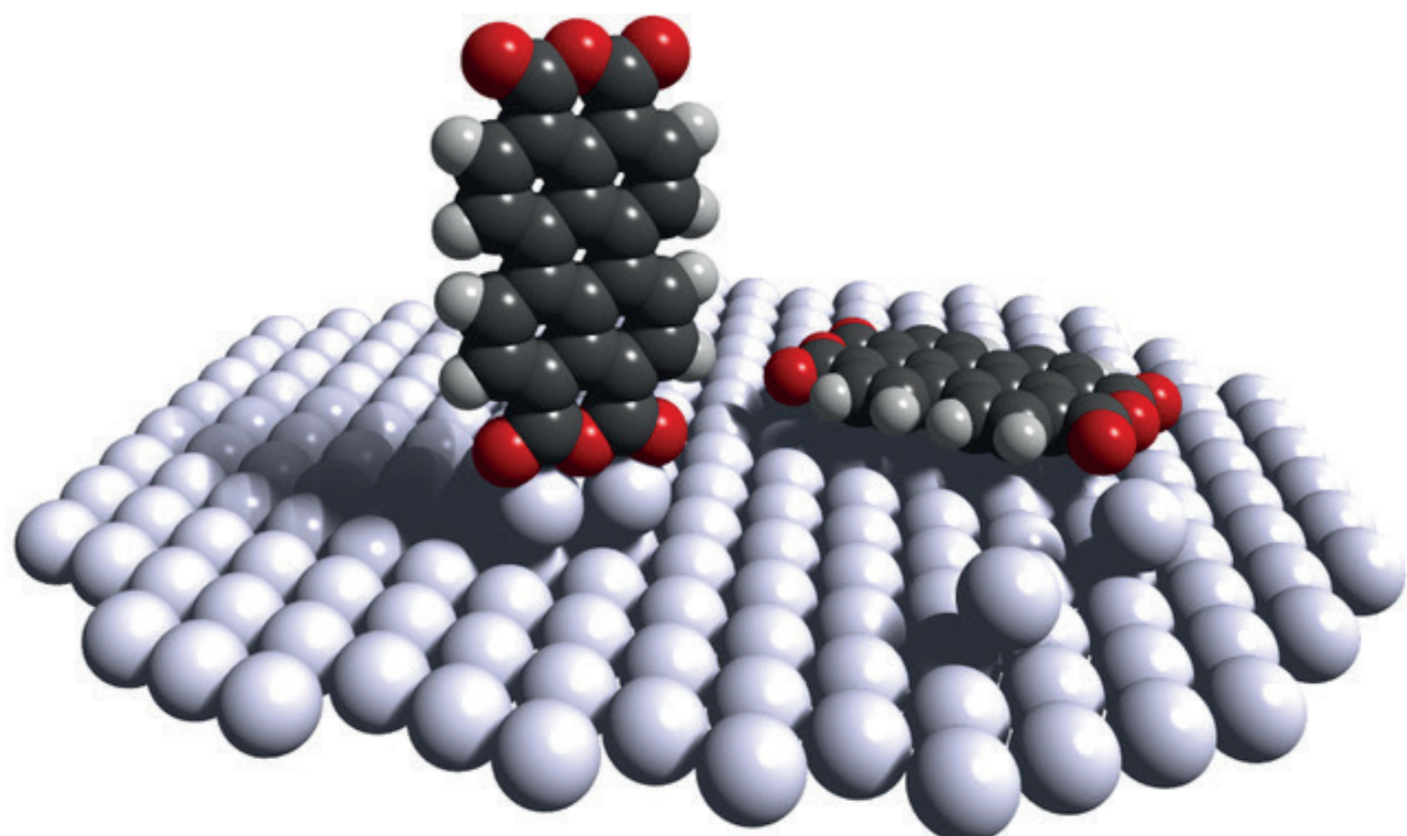
Prof. Dr. Ruslan Temirov

Peter Grünberg Institute 3, Forschungszentrum
Jülich and Institute of Physics II,
University of Cologne



Practicing quantum nanoscience with a scanning probe microscope

Interest in quantum technology is rising swiftly. When implemented in computing it may fundamentally change the way we store and process information. What makes quantum phenomena so interesting and why are their studies challenging? These questions will be discussed from the perspective of the scanning probe microscopy - the experimental technique which enables a direct view into the world of single atoms and molecules adsorbed on a surface. Studies of single atoms and molecules are the main subject of nanoscience primarily because it is in these nanoscale objects the quantum phenomena manifest themselves in the most clear way. Operating a scanning probe microscope at the temperature of liquid helium, today it is routinely possible not only to image complex molecular and atomic structures but also access their electronic vibrational and spin excitations spectra. The recent progress in molecular and atomic manipulation performed with a scanning probe microscope opens a new scene for controlled fabrication of artificial nanoscale structures, the well defined quantum excitations spectra of which may offer a chance of coherent control of their quantum states thus opening a possibility of their future use for quantum information processing.



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16⁴⁵ Uhr / HS III

