

Seminar über Ultrafast Science and Technology

Referent: Alice Sciortino, University of Palermo and University of Catania, Italy, Institute of Applied Physics, University of Bern

Titel: The Wonderland of Carbon Dots

Carbon nanodots are a new class of optically-active nanomaterials which consist in sub-10 nm nanoparticles composed by carbon, oxygen, nitrogen and hydrogen. Their structure is synthesis-dependent and often consists in a nanocrystalline core having, for instance, a graphite or carbon nitride structure, decorated by a variety of polar functional groups on the surface. The most important hallmark of carbon dots is their photoluminescence, which is intense, tunable and sensitive to the external environment. All of these characteristics, combined with the ease and low cost of the synthesis, high water solubility and non-toxicity, make carbon dots very interesting for applications in different fields, as sensing or optoelectronics. However, many questions remain open at the fundamental physical level, triggering an intense debate in the literature. The presentation is focused on the studies on Carbon Dots recently conducted at University of Palermo, which led to the discovery of a new structure of carbon dots, the understanding of their interactions with different solvents, and the investigation of the interactions between carbon dots and nearby ions in solution and in solid-state. These studies allowed us to better understand the physics behind the carbon dots and, in particular, they suggested an interpretation of the mechanism behind the photoluminescence and allowed to clarify why it is tunable. In the last part of the presentation, the in-depth, ongoing studies, stimulated by the recently born collaboration between University of Palermo and University of Bern, will be presented. They will be focused on the employment of femtosecond transient absorption techniques to resolve the entire photo-cycle of carbon dots and to clarify how different types of interactions between dots and the environment occur.

Zeit: Donnerstag, 03.11.2016, 11:15 Uhr

Ort: **Hörsaal B116**, Gebäude exakte Wissenschaften, Sidlerstrasse 5, Bern, Schweiz