

Tutorial: How Quantum is Atto?

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In my lecture I will address the three main themes of the Quantum Battles 2023. First, I will try to answer the question how Quantum is Atto? I will use main concepts of quantum Electrodynamics to show how various processes of attophysics may lead to generation of massive entanglement of photons and matter. In the second part, I will talk about Attoscience of solid, focusing on novel mechanisms of generation of light-matter entanglement in “trivial” and topological solids. I will also discuss high harmonics generation as a tool to detect quantum phases in strongly correlated materials, such as high temperature superconductors. Finally, I will concentrate on novel proposals to detect chirality and symmetries using twisted electrons in single and double electron ionization processes, with and without tailored fields.