Physikalisches Institut
Fakultät für Mathematik und Physik
Albert-Ludwigs-Universität Freiburg

SONDERKOLLOQUIUM

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IM SEMINARRAUM GUSTAV-MIE-HAUS

TIME-DEPENDENT QUANTUM TRANSPORT: CORRELATIONS, INTERFERENCE AND INTERACTIONS

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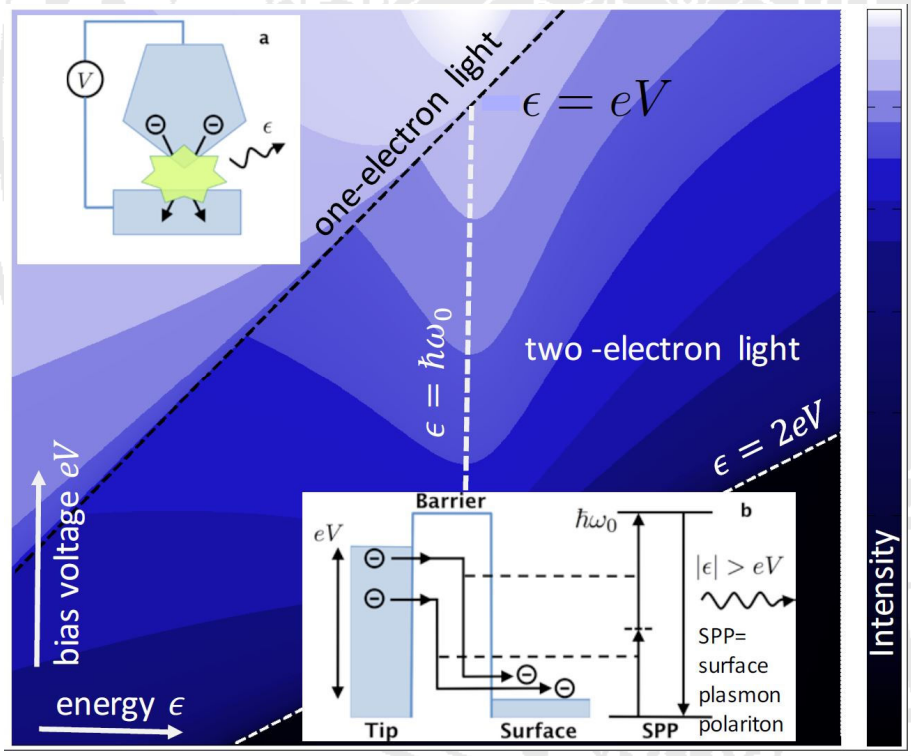

The time-dependent excitation of quantum many-body systems reveals important information on internal correlations, such as entanglement or coherence. In engineered transport setups it is possible to address specific aspects like Coulomb interactions or interference.

In this talk I will demonstrate in illustrative examples how this can be achieved in electronic nanostructures. First, I will show that correlated electron tunneling couples to a plasmon-like degree of freedom, which leads to clear multi-electron signatures in the emitted radiation. Second, I will consider the analysis of driven quantum point contacts revealing non-classical many-body correlations, that are detected in finite-frequency current noise measurements. Finally I discuss time-dependent transport in the broader context of mesoscopic superconductivity, molecular electronics and two-dimensional materials.