



Seminario de Estudiantes 2017-B

Invita a la conferencia

Cooperative effects in quantum transport: from photosynthetic systems to quantum devices

Presenta

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RESUMEN

Cooperative effects in quantum systems are at the center of interest in many physics systems, such as cold atomic clouds, light harvesting systems, and trapped ions. Cooperative quantum effects such as Superradiance and Supertransfer are widely investigated since they can enhance energy transport efficiency and they show robustness to noise. Exploiting such effects and finding novel ones, could be essential to build scalable quantum devices able to operate at room temperature.

In the first part of the talk we will discuss cooperativity in natural photosynthetic complexes. We will stress the role of long range interactions in determining cooperative behaviours.

The second part of the talk will be devoted to discuss the interplay of cooperativity and noise in systems with long range interaction (many body spin systems and tight binding models). The main focus here will be on a novel cooperative effects which we named Cooperative Shielding.

Contrary to the common expectation that long-range interaction will dominate the dynamics, we show that time evolution can be effectively shielded from long-range interaction. This means that evolution can occur as if long range interaction would be absent. This shielding phenomenon can be related to the quantum Zeno effect. This implies that long-range interaction plays a role similar to a measuring apparatus.

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