

THE MICROSCOPIC ORIGIN OF THE MACROSCOPIC DIELECTRIC PERMITTIVITY OF CRYSTALS

– talk –

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The aim of this talk is to present a study of the response of crystals to external, static or time-dependent forcings [3, 4]. The mathematical treatment relies on the properties of localized defects [2] and their time evolutions. In particular, it provides a mathematical analysis of the Adler-Wiser formula [1, 6] relating the (possibly frequency dependent) macroscopic relative permittivity tensor to the microscopic structure of the crystal at the atomic level. It also gives sound foundations to the random phase approximation, a fundamental ingredient of the GW approximation [5] to compute accurate band gaps in photovoltaic materials.

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