



FIM-S3 SEMINAR

Strong electron-hole interaction effects in low density systems

Friday November 8th, 2024 – 12.00 (sharp) S3 Seminar Room, 3rd Floor, Physics building Remote link: <u>Teams</u>

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Abstract

Excitonic effects in extended systems can be explained on the basis of a screened direct electron-hole interaction and an unscreened exchange counterpart. In this talk, we will discuss two cases where one or both of these two contributions lead to dramatic effects that emerge in a low-density situation. On one side, the homogeneous electron gas shows exotic collective excitations due to a strong direct electron-hole interaction, in spite of perfect macroscopic screening [1]. On the other side, solid helium is a strongly inhomogeneous system with low average density, and the interplay of the electron-hole exchange interaction and the weakly screened direct electron-hole attraction strongly affects the loss function. We will analyze these examples and discuss consequences for the interpretation of experiments and for future work.

The results that will be presented were obtained in collaboration with members of the Palaiseau Theoretical Spectroscopy Group and of the ETSF, and with colleagues from experimental groups.

[1] Jaakko Koskelo, Lucia Reining and Matteo Gatti, https://doi.org/10.48550/arXiv.2301.00474

Host: Elisa Molinari











