



## Mathematics and CS Seminar

# The low density Fermi gas in three dimensions

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Host: Robert Seiringer

In recent decades, the study of many-body systems has been an active area of research in both physics and mathematics. In this talk, we consider a system of  $N$  interacting fermions with spin  $1/2$  confined in a box in the dilute regime. We are interested in studying the correlation energy, defined as the difference between the energy of the fundamental state and that of the free Fermi gas. We will discuss some recent results on a first-order asymptotic for the correlation energy in the thermodynamic limit in which the number of particles and the size of the box are sent to infinity while keeping the density fixed. In particular, we will present a new upper bound for the correlation energy, which is consistent with the well-known Huang-Yang formula of 1957. In the last part of the talk, we will discuss some ideas for the rigorous validation of the Huang-Yang conjecture.

**Tuesday, November 28, 2023 04:15pm - 05:15pm**

Heinzel Seminar Room (I21.EG.101), Office Building West, ISTA



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