Seminar/Talk

A study of a simple equation that describes the ground-state energy of a Bose gas at low and high density and in dimensions one, two and three

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Host: Robert Seiringer

I will start with a quick review of the simple equation derived in 1964 to calculate the ground state energy E of a dilute Bose gas with 2-body repulsive interactions. It yielded the famous LHY term. Beyond that it suprisingly works reasonably well for all densities. It was then shown to work very well for the 1D delta function gas where the exact E is known and shown to be in error by at most 29%. It works well for quantum jellium also. In current work with Eric Carlen and Ian Jauslin further results are obtained, partially with the help of modern computers: (a) Rigorous proof of existence of a solution in all D, especially 2D where Schick had derived the answer with great labor (later proved correct with Jakob Yngvason); (b) estimates of the condensate fraction which have an interesting, unforeseen twist at high density; (c) Proof, by computation only, so far, of thermodynamic stability.

Thursday, November 7, 2019 04:00pm - 06:00pm

Heinzel Seminar Room / Office Bldg West (I21.EG.101)

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