



## Seminar/Talk

# Third order upper bound for the ground state energy of the dilute Bose gas

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Host: Robert Seiringer

We prove an upper bound for the energy of a dilute Bose gas in the thermodynamic limit that correctly resolves the third order correction as predicted by Wu as well as by Hugenholtz and Pines and by Sawada. The error term is of the correct fourth order. Our result applies to radial interaction potentials  $V \in L^2(\mathbb{R}^3)$  with compact support that have positive scattering length, are stable and do not admit two-body bound states. In particular, it covers the case of nonnegative potentials, and thus, also generalizes the technical assumptions used for the Lee-Huang-Yang upper bound by Yau and Yin and by Basti, Cenatiempo and Schlein. On the technical side, the biggest novelty is the introduction of a cutoff imposing restrictions on the local number of excitations that allow us to construct a trial state with the right energy density on any length scale shorter than the thermodynamic one. This is joint work with Morris Brooks, Diane Saint Aubin and Benjamin Schlein.

**Tuesday, March 25, 2025 04:00pm - 05:00pm**

Office Bldg West / Ground floor / Heinzl Seminar Room (I21.EG.101)



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