BOSE-EINSTEIN CONDENSATION FOR TWO DIMENSIONAL INTERACTING BOSONS IN THE GROSS-PITAEVSKII SCALING

CRISTINA CARACI

In this talk I will discuss a system of N bosons trapped in a two-dimensional box with area one, interacting through a repulsive potential with scattering length exponentially small in the number of particles, the so-called Gross-Pitaevskii regime. Assuming some regularity conditions on the interaction potential V, we show that low-energy states exhibit complete Bose-Einstein condensation, with almost optimal bounds on the number of orthogonal excitations.

I will also explain how it is possible, exploiting this result, to get further information on the low-lying excitation spectrum of the system. This is a joint work with S. Cenatiempo and B. Schlein, and part of my PhD thesis [1, 2, 3].

REFERENCES

[1] C. Caraci. Bose-Einstein condensation for two dimensional interacting bosons: mean field and Gross-Pitaevskii scalings. *PhD Thesis - GSSI* (2021)

[2] C. Caraci, S. Cenatiempo, B. Schlein. Bose-Einstein condensation for two dimensional bosons in the Gross-Pitaevskii regime. *J. Stat. Phys.* **183**(39), (2021).

[3] C. Caraci, S. Cenatiempo, B. Schlein. The excitation spectrum of two dimensional Bose gases in the Gross-Pitaevskii regime. *In preparation.*

Institut für Mathematik -Universität Zürich
Email address: cristina.caraci@math.uzh.ch