1135-81-2789 **Li Chen*** (il.chen@mail.utoronto.ca), Department of Mathematics, Bahen Centre, 40 St. George St., Room 6290, Toronto, Ontario M5S 2E4, Canada, and **Israel Michael Sigal** (im.sigal@utoronto.ca), Department of Mathematics, Bahen Centre, 40 St. George St., Room 6290, Toronto, Ontario M5S 2E4, Canada. *On the Bogoliubov de Gennes Equations.* Preliminary report.

The Bogoliubov de Gennes (BdG) equations form a microscopic description of superconductivity. These are the static equations of the time dependent version, of which the latter assumes the form of Heisenberg equations with a self-consistent Hamiltonian.

When the temperature T is lower than a certain critical T_c, superconducting solutions emerges. Macroscopically, one can capture the behavior of these superconducting states by the celebrated Ginzburg-Landau equations when T is near T_c. It turns out that the macroscopic theory is an approximation to the microscopic theory when T is close to T_c. In this talk, I will present a sketch of the derivation of the Ginzburg-Landau equations as an effective equation of the BdG equations. The main idea of the derivation is to perform bifurcation at the normal (non superconducting) state and to employ iterated Lyapunov Schmidt maps.

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