

## Lecture 8.

### Preliminary list of topics

- (1) Idea of Bogolyubov's construction of the mean-field theories.
- (2) The range of validity of MF  $d_{lc}$  &  $d_{uc}$ .
- (3) The phenomenological approach of Lev Landau.
- (4) Landau theory of the second order phase transitions
  - (a) order parameter  $m$
  - (b) Free energy  $F(m, T, h)$ , symmetry and analytic properties of the Free energy and its coefficients.
  - (c) analysis of  $F(m, T, h)$ .  $m(T)$ ,  $C(T)$ ,  $\chi(T)$