

# Master Physique fondamentale et applications

## Advanced quantum statistical physics

### Informations

Composante : Faculté des Sciences

### Langue(s) d'enseignement

Anglais

### Contenu

Linear response theory  
microscopic superconductivity (Bogoliubov and BCS)  
quantum field theory at finite temperature, imaginary time green's functions  
bose einstein condensation and the dilute bose gas  
introduction to 1D correlated fermion and Luttinger liquids

### Compétences à acquérir

second quantization, grand canonical formalism  
microscopic superconductivity  
Feynman diagrams for thermodynamical potentials  
Bogoliubov approach for the dilute Bose gas  
bosonisation for correlated fermions in one dimension

### Bibliographie, lectures recommandées

Huang, Statistical Mechanics; Doniach and Sonheimer; Abrikosov, Methods of quantum field theory in statistical physics  
Ketterson and Song, superconductivity; Bruss and Flensburg, Many body quantum theory in condensed matter physics  
Altland and Simons, Field theoretical condensed matter

### Pré-requis obligatoires

Quantum Mechanics, statistical physics  
condensed matter physics background

### Prérequis recommandés

second quantization, grand canonical formalism  
course on quantum aspects of condensed matter physics

### VOLUME HORAIRE

- Volume total: 60 heures
- Cours magistraux: 30 heures
- Travaux dirigés: 30 heures

### Codes Apogée

- SPFCU02C [ELP]

### Pour plus d'informations

[Aller sur le site de l'offre de formation...](#)

