

# WEAK AND STRONG LOCALIZATION

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## Outline

- I. Quantum theory of transport (2 hours)
- II. Weak localization (1 hour)
- III. Coherent Back-Scattering (CBS) (1.5 hours)
- IV. Anderson (strong) localization – Scaling theory (2 hours)
- V. Self-consistent theory of localization (1 hour)

## Some references

- Dossier *Localisation d'Anderson* (in French) in Images de la Physique 2009, <http://www.cnrs.fr/publications/imagesdelaphysique/2009.htm>
- S. Datta, *Electronic transport in mesoscopic systems*, Cambridge University Press (1995).
- E. Akkermans and G. Montambaux, *Physique Mésooscopique des électrons et des photons*, EDP Sciences, CNRS Editions (2004); In English : Cambridge University Press (2007).
- Y. V. Nazarov and Y. M. Blanter, *Quantum Transport: Introduction to Nanoscience*, Cambridge University Press (2009).
- B. L. Altshuler and P. A. Lee, *Disordered electronic systems*, Physics Today **41**, 36-44 (1988).
- B. Kramer and A. MacKinnon, *Localization: Theory and Experiment*, Rep. Prog. Phys **56**, 1469 (1993).
- S. Chakravarty and A. Schmid, *Weak localization: the quasiclassical theory of electrons in a random potential*, Phys. Rep. **140**, 193-236 (1986).
- P.A. Lee and T.V. Ramakrishnan, *Disordered electronic systems*, Rev. Mod. Phys **57**, 287 (1985).

For additional references, see the bibliography in [http://lptms.u-psud.fr/christophe\\_textier/enseignements/enseignements-en-master/onde-en-milieu-desordonne/](http://lptms.u-psud.fr/christophe_textier/enseignements/enseignements-en-master/onde-en-milieu-desordonne/).