

Predoc School "Cold atoms and quantum transport", les Houches, october 2017

Course : Quantum transport in electronic systems , G. Montambaux

3 lectures (1h30)

A short overlook :

- Mesoscopic Physics = Quantum coherence
- Introduction to the domain of mesoscopic physics, deviations to classical transport
- The important length scales, the different regimes (ballistic/diffusive , coherent/incoherent)
- Conduction = transmission \rightarrow the Landauer formula
- Landauer-Buttiker multi-terminal formalism
- Ballistic systems : quantization of conductance
- Diffusive systems : Weak-localization
- Diffusive systems : Universal conductance fluctuations
- What limits phase coherence ?

A few references :

- E. Akkermans and G. Montambaux,
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Cambridge University Press (2009)
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in *Mesoscopic Quantum Physics, Proceedings of the Les Houches Summer School, Session LXI*, ed. by E. Akkermans, G. Montambaux, J.-L. Pichard and J. Zinn-Justin (Elsevier, Amsterdam, 1995)
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