

Non-equilibrium Physics

Non-equilibrium physics is a wide field

→ active research at Bielefeld

EB: Borghini, Bodohar, Schlichting

ES: Dahm, Reimann, Schnack

+ Exp Physics

will not be able to cover everything
in a single lecture

Will cover aspects of NonEq
that are accessible with
undergraduate (B.Sc.) physics knowledge

Pre-requisites: Classical Mechanics
Statistical Mechanics
Quantum Mechanics

will try to briefly review the
relevant aspects where needed

Generally can distinguish
different classes of NonEq
Systems & theoretical description

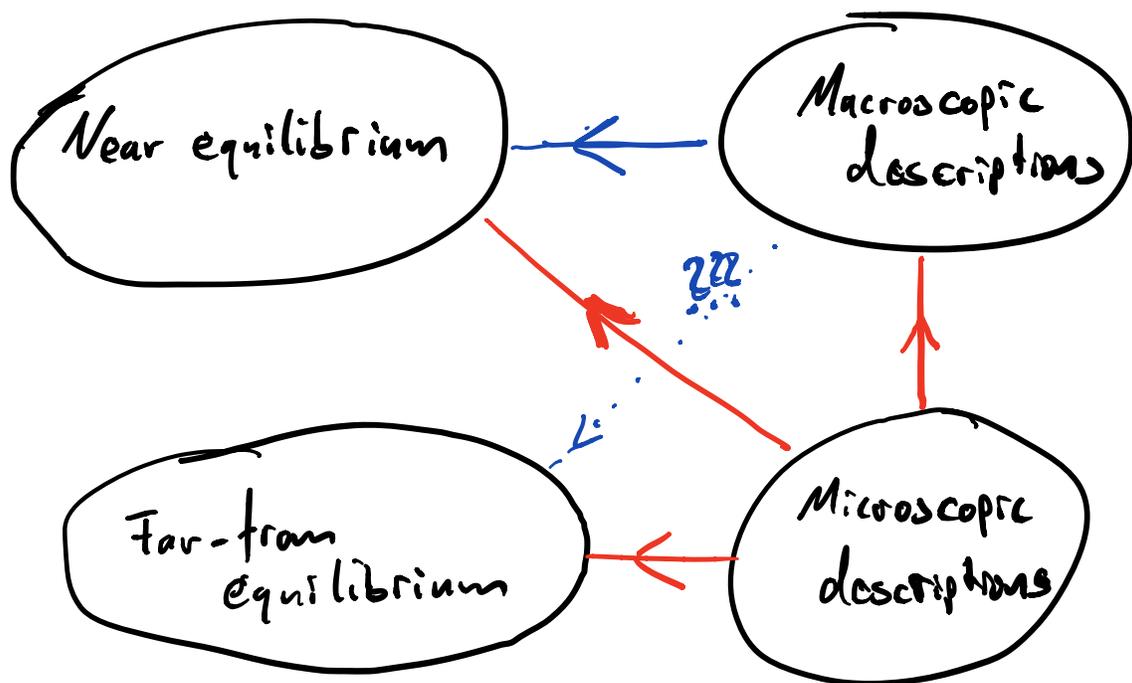
Near equilibrium

Macroscopic
descriptions

Far-from
equilibrium

Microscopic
descriptions

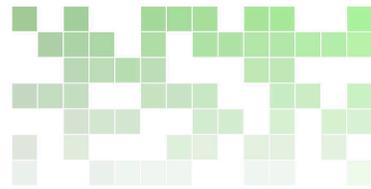
Different theoretical descriptions
required to describe different aspects
of non-equilibrium phenomena



Topics

- Thermodynamics of irreversible processes
- Statistical description of classical & quantum systems
- Kinetic theory
- Turbulence
- Stochastic processes
- Linear response theory

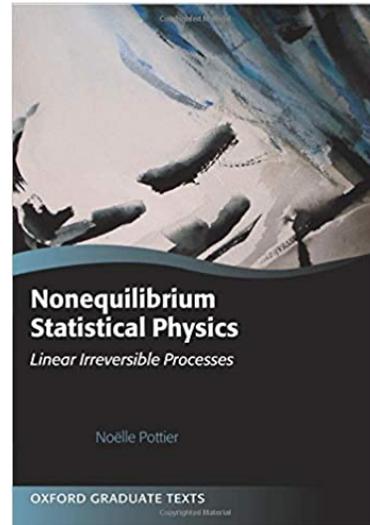
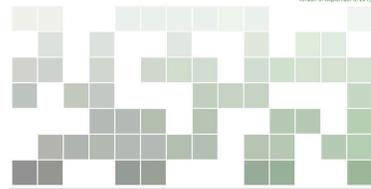
Will mostly follow



Topics in Nonequilibrium Physics

Nicolas Borghini

Version of September 6, 2016



available online at

<https://www.physik.uni-bielefeld.de/~borghini/Teaching/Nonequilibrium/Nonequilibrium.pdf>

If desired can provide additional literature

Even though notebooks will be uploaded to webpage, strongly advise to keep own notes to process materials

Questions/Comments/Wishes

→ your feedback is important

- EKVU Lernraum Forum

- Discussion sessions