Theoretische Festkörperphysik 2

Lecturer: Dr. Lorenzo Del Re

Classes (SE 4)

Wed: 10:00 - 12:00,

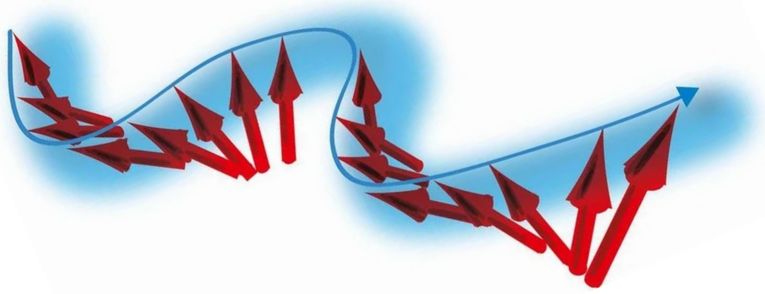
Thu: 12:00 - 14:00

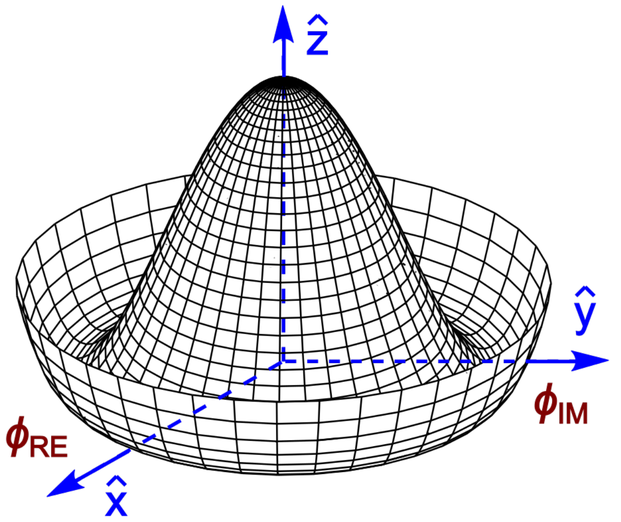
Tutorial (SE 4)

Wed: 14:00 - 16:00

Teaching assistants:
Dr. Francesca Paoletti,
Dr. Matteo Crispino

This course develops a unified theoretical framework to understand **phase transitions** and emergent **collective behaviour.** Starting from **Landau theory** and **saddle-point** approximations, we progressively incorporate **fluctuations**, explore symmetry breaking and **Goldstone modes**, and build up to the **renormalisation group** and **ε-expansion** as systematic tools to describe **universality** beyond mean-field theory.





Topics

- Landau-Ginzburg Theory
- Saddle Point Approximation
- Phase Transitions and Critical Exponents
- Fluctuations, Goldstone modes
- Scaling Hypothesis
- Perturbation Theory
- Renormalisation group and ε-expansion