



Universität Hamburg

DER FORSCHUNG | DER LEHRE | DER BILDUNG

CHAMPP

CENTER IN HAMBURG FOR
ASTRO-, MATHEMATICAL AND
PARTICLE PHYSICS

LECTURE COURSE IN THE QUANTUM UNIVERSE RESEARCH SCHOOL

Winter Term 2023/2024

Quantum mechanics II

Michael Potthoff

Course Description:

Tentative overview of topics:

- Many-body quantum theory, second quantization
- Variational principle, Wick's theorem, mean-field theory
- Perturbation theory, linear-response theory, Green's functions
- Groups, Wigner's theorem, representation theory
- Representations on Fock space, anti-unitary representations
- Adiabatic dynamics, Berry phase, topological invariants, topological insulators
- Path integrals for bosons/fermions/spins
- Many-body perturbation theory, Feynman diagrams

Literature and further details can be found at <https://www.physik.uni-hamburg.de/th1/ag-potthoff/lehre/ws-2023-2024-quantum-mechanics-2.html>.

Prerequisites:

Lecture Quantum Mechanics I

Date and Place: Tue, 10:15–11:45, Hörsaal, Building 61, Bahrenfeld
Thu, 10:15–11:45, Hörsaal, Building 61, Bahrenfeld

Problem Classes: Thu, 12:15–13:45, SR 1076, Notkestr. 9, Bahrenfeld/
Thu, 12:15–13:45, SR 4064, Notkestr. 9, Bahrenfeld/
Thu, 14:15–15:45, SR 1076, Notkestr. 9, Bahrenfeld

Starting on: 17 October 2023
