Many-Body Theory in Condensed Matter, WS 2018/19 (Lecturer: Hong-Hao Tu)

Lectures Tutorials	Tue + Wed Wed	Topic
L1	09.10.18	**Many-particle quantum mechanics** Review of single-particle quantum mechanics
L2	10.10.18	**Many-particle quantum mechanics** Feynman path integral
L3	16.10.18	**Many-particle quantum mechanics** Second quantization, bosons/fermions
T1	17.10.18	
L4	23.10.18	**Many-particle quantum mechanics** Non-interacting bosons/fermions, Majorana fermions
L5	24.10.18	**Many-particle quantum mechanics** Coherent states for bosons/fermions, functional integral, Green's function
L6	30.10.18	**Many-particle quantum mechanics** Spin coherent states, functional integral
	31.10.18	**Reformation Day**
L7	06.11.18	**Symmetry breaking and phase transitions** Spontaneous symmetry breaking, mean-field theory
L8	07.11.18	**Symmetry breaking and phase transitions** Goldstone mode, Mermin-Wagner theorem
L9	13.11.18	**Symmetry breaking and phase transitions** Kosterlitz-Thouless transition
T2	14.11.18	
L10	20.11.18	**Interacting bosons** Weakly interacting Bose gas
	21.11.18	**Repentance Day**
L11	27.11.18	**Interacting bosons** Superfluid-Mott phase transition
T3	28.11.18	
L12	04.12.18	**Interacting fermions** RPA theory of a Coulomb gas
L13	05.12.18	**Interacting fermions** Fermi liquid theory
L14	11.12.18	**Interacting fermions** BCS theory of superconductivity
L15	12.12.18	**Interacting fermions** Strongly correlated electrons: Hubbard model
L16	18.12.18	**Interacting fermions** Magnetic instabilities in strongly correlated electronic systems
T4	19.12.18	
L17	08.01.19	**Physics in one dimension** Bethe ansatz and exact solution
L18	09.01.19	**Physics in one dimension** Bosonization
L19	15.01.19	**Physics in one dimension** Luttinger liquid, spin-charge separation
T5	16.01.19	
L20	22.01.19	**Physics in one dimension** Haldane's conjecture, AKLT model
L21	23.01.19	**Topology** Integer quantum Hall effect, Hofstadter model, TKNN invariant
L22	29.01.19	**Topology** Fractional quantum Hall effect, Laughlin's wave function, anyons
T6	30.01.19	