

**Solid State Theory, SoSe2019 (Lecturer: Hong-Hao Tu)**

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<b>Lectures Tutorials</b>	<b>Tue + Thu Thu</b>	<b>Topic</b>
L1	02.04.19	<b>Lattice dynamics</b> classical theory
L2	04.04.19	<b>Lattice dynamics</b> quantum theory
L3	09.04.19	<b>Lattice dynamics</b> thermodynamics, Debye vs. Einstein model
T1	11.04.19	
L4	16.04.19	<b>Electron gas</b> free electron gas at zero and finite temperatures
L5	18.04.19	<b>Electron gas</b> second quantization formulation
L6	23.04.19	<b>Electron gas</b> electron correlations, Hartree-Fock approximation
T2	25.04.19	
L7	30.04.19	<b>Electrons in a periodic potential</b> Bloch electrons, symmetries
L8	02.05.19	<b>Electrons in a periodic potential</b> nearly free electrons
L9	07.05.19	<b>Electrons in a periodic potential</b> tight-binding approximation, LCAO, Wannier functions
T3	09.05.19	
L10	14.05.19	<b>Electrons in a periodic potential</b> graphene
L11	16.05.19	<b>Theory of electron transport</b> semiclassical theory
L12	21.05.19	<b>Theory of electron transport</b> Boltzmann equation
T4	23.05.19	
L13	28.05.19	<b>Theory of electron transport</b> transport properties
	30.05.19	<b>Christi Himmelfahrt (public holiday)</b>
L14	04.06.19	<b>Electrons in a magnetic field</b> energy levels, single-particle states
L15	06.06.19	<b>Electrons in a magnetic field</b> Pauli paramagnetism, Landau diamagnetism, de Haas-van Alphen effect
L16	18.06.19	<b>Electrons in a magnetic field</b> integer and fractional quantum Hall effects
T5	20.06.19	
L17	25.06.19	<b>Magnetism</b> direct exchange vs. superexchange
L18	27.06.19	<b>Magnetism</b> Heisenberg model, ferromagnetism vs. antiferromagnetism
L19	02.07.19	<b>Magnetism</b> spin-wave theory, magnons
L20	04.07.19	<b>Superconductivity</b> electron-phonon interaction
L21	09.07.19	<b>Superconductivity</b> Schrieffer-Wolff transformation, Cooper pair
L22	11.07.19	<b>Superconductivity</b> BCS theory