

Plenary talks (PV)

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**Plenary Talk** PV XII Thu 9:15 V53.01  
**Synthetic Quantum Matter under the Microscope** — ●MARKUS GREINER — Harvard University

Ultracold atoms in optical lattices enable experimenters to create and study synthetic quantum matter, opening a window into the fascinating world of many-body quantum physics. With quantum gas mi-

croscopy we are now able to take the control of atoms in an optical lattice to the next, the ultimate, level of being able to address, manipulate and measure single particles with high fidelity. I will present microscopic studies of strongly correlated quantum matter and the first realization of quantum magnetism in an optical lattice. This work opens a wide range of new possibilities and brings the realization of exotic states of matter within experimental reach.