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A quantum gas microscope for ytterbium atoms

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In this talk, I report on the development of a quantum gas microscope for ytterbium (Yb) atoms. By using a dual molasses technique in which 399 nm molasses beams of the broad singlet transition are applied for fluorescence imaging and 556 nm molasses beams of the narrow intercombination transition are applied for cooling during the imaging, we successfully demonstrate site-resolved imaging of individual bosonic ^{174}Yb atoms in a two-dimensional optical lattice with a lattice constant of 266 nm.We also apply a high resolution laser spectroscopy using the ultranarrow intercombination transition between the $^1S_0$ and $^3P_2$ states to manipulate an atom distribution in an optical lattice. We expect the demonstrated technique will similarly work for other isotopes of Yb atoms. We are also developing a different mode of an Yb quantum gas microscope.