Poincare duality provides an isomorphism between the homology and cohomology of a compact manifold, up to a shift. For \(\pi\)-finite spaces, i.e. spaces with finitely many non-zero homotopy groups, all of which are finite, there is a similar duality only for \(\mathbb{Q}\)-coefficients, but no such duality exists with \(\mathbb{F}_p\) coefficients. However, as shown by Michael Hopkins and Jacob Lurie, there is a duality between the homology and cohomology of \(\pi\)-finite spaces with coefficients in some extra-ordinary cohomology theories called Morava K-theories. This property of Morava K-theory is called ambidexterity. I will explain what is ambidexterity, some of its consequences and our contribution to the subject.

This is a joint work with Lior Yanovski and Tomer Schlank.