1151-55-122 **Allen L Yuan*** (alleny@mit.edu). *Integral models for spaces and the higher Frobenius.*

We will describe a fully faithful integral model for spaces in terms of their algebras of cochains which assembles Mandell's p-adic homotopy theory with Sullivan's rational homotopy theory. The key input is the development of a homotopy coherent Frobenius action on a certain subcategory of p-complete $\mathbb{E}_\infty$-rings for each prime p. Using this, we will see that the data of a space X is the data of its $\mathbb{E}_\infty$-algebra of spherical cochains together with a trivialization of the Frobenius action after completion at each prime.

Time permitting, we may discuss some of the ideas that go into producing this Frobenius action. The first of these is a more general action of Frobenius in equivariant stable homotopy theory; we will see that a version of Quillen's Q-construction acts on certain $\mathbb{E}_\infty$-rings with "genuine equivariant multiplication," which we call global algebras. The second main idea is a "pre-group-completed" variant of algebraic K-theory which we call *partial K-theory*. We will state some basic definitions and results about partial K-theory and briefly discuss the computation of the partial K-theory of $\mathbb{F}_p$ up to p-completion. (Received August 13, 2019)