1116-14-1803 **Inna I Zakharevich*** (zakh@math.uchicago.edu), 5734 S University Ave, Eckhart 208, Chicago, IL 60637. *Deriving the Grothendieck ring of varieties.*

The Grothendieck ring of varieties over a base field k—written $K_0[\mathcal{V}_k]$—is defined to be the free abelian group generated by varieties over k, modulo the relations that for any closed immersion $Y \hookrightarrow X$, $[X] = [Y] + [X \setminus Y]$. The multiplication is induced by the Cartesian product of varieteies. The abelian group $K_0[\mathcal{V}_k]$ is the universal additive invariant: any function of varieties χ that satisfies $\chi(X) = \chi(Y) + \chi(X \setminus Y)$ factors through $K_0[\mathcal{V}_k]$. In this talk we construct a topological space whose π_0 is $K_0[\mathcal{V}_k]$, and whose higher homotopy groups produce invariants of automorphisms of varieties. This allows us to construct a spectral sequence whose differentials measure the difference between two varieties being birational and stably birational. We use this spectral sequence to show that any element in the annihilator of $[\mathbb{A}^1]$ can be written as $[X] - [Y]$, where $X \times \mathbb{A}^1$ and $Y \times \mathbb{A}^1$ are stably birational but not birational. (Received September 21, 2015)