1011-14-237 **Marc Levine*** (marc@neu.edu), Department of Mathematics, Northeastern University, Boston, MA 02115. *Applications of homotopy theory to algebraic geometry.*

We discuss three examples of applications of the Morel-Voevodsky homotopy theory of schemes to algebraic geometry:

1. Results on the structure of Voevodsky's slice filtration, which give a new construction of the spectral sequence from motivic cohomology to K-theory.

2. The theory of algebraic cobordism, leading to proofs of Rost's degree formulas and a re-construction of Brosnan's Steenrod operations on the Chow ring

3. An algebraic version of the classical exponential map from the punctured normal bundle to the punctured tubular neighborhood, giving a purely algebraic gluing construction on the moduli spaces of curves with boundary components.

(Received August 29, 2005)