My research involves a mixture of algebraic geometry and algebraic topology. Algebraic geometry is the study of solutions of equations (called a *variety*), using a both algebra and geometry. For example, one can study a sphere by examining its equation $x^2 + y^2 + z^2 = 1$, or by looking at its geometric properties. Algebraic topology studies spaces by attaching algebraic invariants to them, invariants which can often be computed explicitly. When you mix these two together, you get invariants attached to varieties by using algebraic versions of the constructions used in topology.

The most well-known such topological invariant is called *singular cohomology*. It began to be developed in the late 19th century, and was fully defined by the 1930's. The algebraic version, called *motivic cohomology*, also has roots from the late 19th century, but was only partly defined in the 40's and 50's, and was not until 1985 that the first complete definition was found. Another such pair is *topological K-theory* and *algebraic K-theory*, the topological version arising in the 50's, and the algebraic version being first defined in the early 70's. In the 60's, it was realized that one could construct a whole series of theories like K-theory in the topological setting, but it was not until very recently that Morel and Voevodsky developed methods for defining the algebraic versions of these theories.

The invariants in algebraic geometry are much more difficult to compute than the corresponding ones in algebraic topology. For instance, one of the most famous and important unsolved problems in modern mathematics, the *Hodge conjecture* (named for the English mathematician W.V.D. Hodge) states a formula which is supposed to determine which part of the singular cohomology of a variety comes from the motivic cohomology. Also mysterious is the part of the motivic cohomology which vanishes when taking its topological image.

My own research has dealt with several problems in this area. I have helped verify some of the basic properties of motivic cohomology. With Thomas Geisser, we made explicit computations of motivic cohomology and algebraic K-theory, verifying some simpler versions of some of the conjectures mentioned above. I have helped to show that a comparison between singular cohomology and topological K-theory, the *Atiyah-Hirzebruch spectral sequence*, exists for motivic cohomology and algebraic K-theory. More recently, I and Fabien Morel have constructed a version of the topological theory of *complex cobordism* in an algebro-geometric setting. We hope that this new construction will allow us to apply the powerful methods of algebraic topology to difficult problems in algebraic geometry.