1035-11-1872 **Michael W Daub*** (08mwd@williams.edu), Chapin Hall Dr, 2173 Paresky, Williamstown, MA 01267. *Class Numbers and Lengths of Hilbert Class Tower Fields.*

In 1847, Gabriel Lamé announced that he had a proof of Fermat's Last Theorem. His proof relied on unique factorization in the ring $\mathbb{Z}[\zeta_p]$, where $\zeta_p = e^{2\pi i/p}$. This ring is not a unique factorization domain in general, however, and hence Lamé's proof contained a flaw. Although a correct proof of Fermat's Last Theorem was not found until almost 150 years later, the entire field of algebraic number theory was born in an attempt to resolve the problem. Given an integral extension of the integers, like the rings Lamé dealt with, we can define an equivalence relation on the nonzero ideals. The equivalence classes of these ideals form a finite abelian group, called the class group. The class number, or size of the class group, is 1 if and only if the ring is a unique factorization domain, and in fact, the class group gives even more information about the structure of the ring and its field of fractions. In this talk we will be discussing some recent results on class numbers and Hilbert class fields. (Received September 20, 2007)