From Ancient Egyptian Fractions to Modern Algebra

The ancient Egyptians (circa 2000 B.C.) did not use modern notation to express rational numbers. In fact, they only had notation for so-called 'unit fractions,' that is, rational numbers of the form 1/n for some nonzero integer n. They expressed rational numbers as sums of *distinct* unit fractions, and such sums are called 'Egyptian fractions' in modern times. Fibonacci proved that every rational number can be so-expressed, and in contemporary mathematics, there remain unsolved number-theoretic problems involving Egyptian fractions. The purpose of this talk is to translate the notion of Egyptian fraction to the realm of ring theory. In particular, we give a canonical definition of an 'Egyptian domain' and present some fundamental theory on such structures.