The study of vector bundles and related structures has played an important role in our understanding of the topology and geometry of manifolds. In this talk I will describe a few of the ways in which the study of algebraic structures such as quadratic forms, division algebras have played a closely analogous role in our understanding of the arithmetic of fields, and how new ways of importing techniques from topology to has led to important new advances in our understanding of these structures. (Received January 27, 2014)