Abstract

I will describe how to use topological Azumaya algebras, or, equivalently, principal $PU_n$-bundles, to think about two problems in algebraic geometry: the period-index problem about the degrees of division algebras over function fields, and the problem of the existence of projective maximal orders in unramified division algebras. In particular, using topological methods, I will show that projective maximal orders do not necessarily exist, which solves an old problem of Auslander and Goldman.