Abstract

In this talk, we will first review how symmetric bilinear forms naturally arise in topology. We will then explore how the eta invariant, introduced by Atiyah, Patodi, and Singer, serves as the boundary contribution to the signature of these forms when dealing with manifolds with boundary. At the same time, the eta invariant can also be understood as the signature of a symmetric bilinear form on an infinite-dimensional vector space. We will delve into the geometric and topological properties of this intriguing invariant.