

K-Theory, Quadratic Forms & Algebraic Structures

Dr. Ambily A. A. specializes in the field of **algebraic K-theory** and its connections to **quadratic forms** and **algebraic topology**. Her research explores how algebraic structures such as modules, vector bundles, and quadratic forms can be classified, compared, and understood through K-theory, a powerful tool in modern mathematics. Specifically, she investigates the properties and invariants of quadratic forms, which are essential in number theory, geometry, and topology.

She also works on topics related to the **Horrocks Quillen Suslin theorem**, which addresses questions about when modules over polynomial rings are free, a fundamental problem in commutative algebra with implications in geometry and algebraic K-theory. Her contributions deepen the understanding of the structure of algebraic objects and their symmetries, shedding light on fundamental questions in pure mathematics while also informing related areas such as coding theory and the study of manifolds.

Through her work, Dr. Ambily advances the theoretical foundations of algebra and topology, helping to solve long-standing problems and contributing to the rich interplay between algebra, geometry, and number theory.