DAVID SALTMAN, IDA–Princeton

Embedding Division Algebras

Division rings are noncommutative fields meaning associative rings where every nonzero element has a multiplicative inverse. Division algebras are division rings finite dimensional (or just finite) over their centers and are the basic elements in Brauer groups. Many years ago P. M. Cohn proved that any two division rings of the same characteristic embed in a third division ring. If one applies this to division algebras, the new third division ring is huge and is certainly NOT finite over its center. Thus Lance Small asked whether two division algebras of the same characteristic could be embedded in a third division algebra. We will show the answer is "no", but yes if we require the division algebras be finitely generated over the same prime or other perfect field. The tools we will use involve generalized Severi–Brauer varieties (forms of Grassmanns) and some old index reduction results that, in one form, involve Moody's Theorem.

This is joint work with Louis Rowen.