Topological Viewpoints on Algebraic Complexity

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Understanding algebraic structures such as Galois extensions, quadratic forms and division algebras, can give important insights into the arithmetic of fields. In this talk, I will discuss recent work showing ways in which the arithmetic of certain fields can be partially described by topological information. I will then describe how these observations lead to arithmetic versions of the Meyer-Vietoris sequences, the Seifert–van Kampen theorem, and examples and counterexamples to local-global principles.