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Stefan Kebekus: Failure of the Brauer-Manin obstruction for a simply connected fourfold, and an orbifold version of the Mordell theorem (joint with Pereira and Smeets).

Almost one decade ago, Poonen constructed the first examples of algebraic varieties over global fields for which Skorobogatov's etale Brauer-Manin obstruction does not explain the failure of the Hasse principle. By now, several constructions are known, but they all share common geometric features such as large fundamental groups.

This talk discusses a construction of simply connected fourfolds over global fields of positive characteristic for which the Brauer-Manin machinery fails. Contrary to earlier work in this direction, our construction does not rely on major conjectures. Instead, we establish a new diophantine result of independent interest: a Mordell-type theorem for Campana's "geometric orbifolds" over function fields of positive characteristic. Along the way, we also construct the first example of simply connected surface of general type over a global field with a non-empty, but non-Zariski dense set of rational points.