

**Ulmer, Douglas**

**Elliptic curves with large rank over function fields.** (English) Zbl 1109.11314  
*Ann. Math. (2)* 155, No. 1, 295-315 (2002).

Summary: We produce explicit elliptic curves over  $\mathbb{F}_p(t)$  whose Mordell-Weil groups have arbitrarily large rank. Our method is to prove the conjecture of Birch and Swinnerton-Dyer for these curves (or rather the Tate conjecture for related elliptic surfaces) and then use zeta functions to determine the rank. In contrast to earlier examples of Shafarevitch and Tate, our curves are not isotrivial. Asymptotically these curves have maximal rank for their conductor. Motivated by this fact, we make a conjecture about the growth of ranks of elliptic curves over number fields.

**MSC:**

**11G05** Elliptic curves over global fields

**11G40**  $L$ -functions of varieties over global fields; Birch-Swinnerton-Dyer conjecture

Cited in **5** Reviews  
Cited in **36** Documents

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