ALGEBRA AND NUMBER THEORY
SEMINAR

The 1729 K3 surface

Sarah Trebat-Leder
(Emory University)

Abstract: We revisit the mathematics that Ramanujan developed in connection with the famous "taxi-cab" number 1729.
A study of his writings reveals that he had been studying Euler's diophantine equation

$$a^3 + b^3 = c^3 + d^3.$$

It turns out that Ramanujan's work anticipated deep structures and phenomena which have become fundamental objects in arithmetic geometry and number theory. We find that he discovered a $K3$ surface with Picard number 18, one which can be used to obtain infinitely many cubic twists over $\mathbb{Q}$ with rank ≥ 2.

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