# SCMS Seminar

## ON THE SYLVESTER CONJECTURE

**Speaker: Dr. Shu Jie**

**SCMS**

**Time:** 9:30 -10:10, Thursday, June 29, 2017
**Venue:** Room 2201, East Guanghua Tower (Main), Fudan University

**Abstract:** A nonzero rational number is called a cube sum if it is of the form $a^3+b^3$, with $a,b\in\mathbb{Q}^\times$. To determine whether a rational number $n$ is a cube sum is closely related to the arithmetic of the corresponding elliptic curve $x^3+y^3=nz^3$. A famous conjecture concerning the cube sums is the so-called Sylvester conjecture: Any prime congruent to 4,7,8 mod 9 is a cube sum. Dasgupta and Voight proved certain primes 4, 7 mod 9 are cube sums by establishing the nontriviality of certain related Heegner points. Based on the work of Dasgupta and Voight, we prove the Birch and Swinnerton-Dyer conjecture for the related elliptic curves by establishing the explicit Gross-Zagier formulae of the related Heegner points. This is a joint work with Hongbo Yin.

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