Pathways Lecture Series in Mathematics, KEIO

Speaker : Prof. Noam D. Elkies
(Harvard University)

Place : Middle Conference Room
Raiosha BLDG., Hiyoshi Campus
Keio University

Lecture 1	10:30 – 12:00	September 3, 2007 (Monday)
Lecture 2	10:30 – 12:00	September 4, 2007 (Tuesday)
Lecture 3	10:30 – 12:00	September 5, 2007 (Wednesday)

Elliptic surfaces and curves of high rank

I   Context and overview: the theorems of Mordell-Weil and Mazur; the rank problem; the approaches of Neron-Shioda and Mestre; elliptic surfaces and Neron specialization; previous and new rank records.

II   Elliptic surfaces and K3 surfaces: the Mordell-Weil and Neron-Severi groups; K3 surfaces of high Neron-Severi rank and their moduli; an elliptic K3 surface over Q of Mordell-Weil rank 17; quadratic sections, and base changes to rank at least 18 over Q(t), and at least 19 for infinitely many curves over Q.

III   Computational issues, techniques, and results: slices of Niemeier lattices; finding and transforming models of K3 surfaces of high rank; searching for good specializations. Some other applications of K3 surfaces of high rank and their moduli, such as explicit parametrization and Clebsch-Igusa coordinates for various Shimura curves and Hilbert moduli spaces.

21 世紀COEプログラム