Pathways Lecture Series in Mathematics, KEIO

Speaker : # Prof. Mikhail Kapranov
（Yale University）

Place : **Koseito**
3rd Floor, Building 16-A
Yagami Campus, Keio University

Lecture 1	16:30 – 18:00	May 14, 2007 (Monday)
Lecture 2	16:30 – 18:00	May 16, 2007 (Wednesday)
Lecture 3	16:30 – 18:00	May 17, 2007 (Thursday)

Infinite-dimensional objects in algebraic geometry

Many applications of algebraic geometry make it necessary to consider infinite-dimensional objects. A systematic way of doing this is to use the concepts of ind - and pro-objects first introduced by Grothendieck. Passing from finite-dimensional schemes to schemes of infinite type is similar to forming the category of pro-objects, and the ind-object construction is another way of forming infinite objects, dual to the previous one. Both directions are equally important and it is often necessary to combine them both. For example, constructions such as semiinfinite (Floer) homology become very natural in this self-dual context.

The lectures will provide an introduction to these techniques which became quite popular in recent years. The first lecture will be devoted to the general intuition about ind- and pro-objects, the second one to the ind- and pro-objects in the category of schemes, and the third one to some particular examples of ind-schemes such as algebro-geometric models for the spaces of loops.