

Lectures by Tetsuji Shioda

Lecture 1 : An elementary algorithm for constructing a cubic surface together with the 27 lines

We formulate the algorithms, based on the Mordell-Weil lattices, which can be applied (among other application) to the construction of a cubic surface together with 27 lines. This construction contains six free parameters, and in particular, it allows one to construct 6-parameter families of cubic surfaces and 27 lines on them, all defined over a given field, e.g. over the rational number field \mathbb{Q} . Some pictures will be shown.

Lecture 2 : Mordell-Weil lattice of higher genus fibration on a Fermat surface

The Mordell-Weil lattice of higher genus fibration is studied for the axial fibration on a Fermat surface. of degree $m > 3$, with a chosen line as axis. The basic theorems (the rank, the height formula, etc) are obtained, and examples and various generalization will be discussed.