THE UNIVERSITY   **OF HONG KONG**

Institute of Mathematical Research
Department of Mathematics

Geometry Seminar

Tom and Jerry — QQ-Fano 3-folds in codimension 4

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Abstract

My aim is to write down as many QQ-Fano 3-folds X as possible in terms of their anticanonical rings $R(X, -K_X)$. The anticanonical ring is Gorenstein, so that in codimension ≤ 3 it is given by the Hilbert-Burch or Buchsbaum-Eisenbud structure theorems, and is not much harder to work with than a hypersurface. This covers the first few hundred families of QQ-Fano 3-folds. To go further, we use the idea of Kustin-Miller unprojection ("Constructing a bigger Gorenstein ideal from a smaller one"). We have 115 candidates for the numerical types of codimension 4 Fanos that have a Type I projection to codimension 3; in each case, we can construct at least two families of topologically different QQ-Fano 3-folds by a Kustin-Miller unprojection. The two main games, called Tom and Jerry, amount to imposing algebraic conditions on 5×5 skew matrixes. In total, we give around 400 constructions of around 300 families of QQ-Fano 3-folds in codimension 4.

Date:	November 6, 2015 (Friday)
Time:	4:00 – 5:00pm
Place:	Room 210, Run Run Shaw Bldg., HKU

All are welcome