LTCC Proposed Course

Title: Toric Varieties

Basic Details:

- Core Audience (1st yr or 2nd/3rd yr: pure, app. or stats): Pure
- Course Format (**Extended**: 5 x 2hr lectures): 5 x 2hr lectures

Course Description:

- **Keywords**: algebraic geometry, toric varieties, combinatorial algebraic geometry

- **Syllabus:** This course will start with the basics of toric geometry, starting with the definition of a toric variety, affine toric varieties, fans, and how to build a toric variety from a fan. It will then move towards various constructions (e.g., projective toric varieities built from polytopes, divisors, and the class group of a toric variety, toric vector bundles, toric varieties built as GIT quotients).

- **Recommended reading:** Toric Varieties by Cox, Little, and Schenck

- **Additional Optional reading:** Introduction to Toric Varieties by Fulton, Algebraic Geometry by Hartshorne

- **Prerequisites:** Familiarity with basic algebraic geometry, sheaves, and affine schemes; some familiarity with divisors and sheaf cohomology would be nice.

Format:

- No of discussion/problem sheets: 3
- Electronic lecture notes: The course will skip around Cox, Little, Schenck, so there will probably be no typed notes. I am happy to share my scanned notes for the course, which will highlight the sections being covered.

Lecturer Details:

- Lecturer: Prof Tyler Kelly
- Lecturer home institution: QMUL
- Lecturer e-mail: t.l.kelly@qmul.ac.uk