Domingo Toledo, University of Utah

Cubic Forms and Complex Hyperbolic Geometry

The moduli space of complex cubic curves is the quotient of the upper half plane by the modular group, and thus it is a complex hyperbolic space. We will review this classical fact, discuss the geometry of cubic curves and surfaces, and present previous joint work with D. Allcock and J. Carlson showing that the moduli space of complex cubic surfaces is also complex hyperbolic. In fact, this last space is isomorphic to the quotient of the complex four-ball by an arithmetic group with entries in the Eisenstein integers. The isomorphism is achieved by a period map coming from Hodge theory. We will describe some applications of this result, some new results on the inverse of the period map, and finish with speculations on future directions.

Thursday, November 18, 2010
at 4:25 PM in 406 Malott Hall

Refreshments will be served at 3:55 PM in the Mathematics Department lounge (532 Malott Hall).