1006-11-25   **Michael D Fried*** (`mfri4@aol.com`). *Comparing cusps on modular curves to their Modular Tower generalization.*

The Inverse Galois Problem sees this analogy: Modular curve towers are to MTs as dihedral groups are to all finite groups. The (weak) Main Conjecture on Modular Towers (MTs) says rational points disappear at high tower levels. I outlined this, March 2004, at Luminy. My complete paper is at www.math.uci.edu/~mfried/#mt.

Modular curves systematically use cusps. Certain of these cusps support Tate p-adic elliptic curves. The analog for MTs are g-p' cusps. (Several authors on MTs study the special case of Harbater-Mumford cusps.) We will explain why group theory suggests any projective systems of components on a MT comes from a g-p' cusp. Group theorists and Riemann surface people will find this a grand generalization of using spin structures. Some well-worked examples are ready for number theorists to apply to many problems.

All g-p' cusps support geometric objects a little like Tate elliptic curves. These allow us to formulate a Serre Open Image Theorem for MTs. We get new insight into a pressing question: If the Inverse Galois Problem is true, where all those regular realizations? (Received December 21, 2004)