1108-20-207   **Grant Lakeland*** (`gslakeland@eiu.edu`). *Equivalent trace sets for arithmetic Fuchsian groups.*
Let G be a Fuchsian group, and $M = H^2/G$ the associated Riemann surface. The length spectrum of M is the set of lengths of closed geodesics on M, counted with multiplicity, and the length set is the same set without multiplicities. Each is closely related to the traces of elements of G. While isospectral surfaces have the same area, results of Schmutz and Leininger-McReynolds-Neumann-Reid show that this does not hold for length sets. In this talk, I'll show that if G is the modular group, then G contains infinitely many finite index subgroups with the same trace set as G, and hence there exist infinitely many surfaces, each commensurable with the modular surface M, with the same length set. I will also show how to construct examples of such subgroups. Similar results hold when G is, for example, a principal congruence subgroup of the modular group. (Received January 13, 2015)