1053-13-305   **Erin E Chamberlain*** (`chamberlain@math.byu.edu`), Brigham Young University, Department of Mathematics, 263 TMCB, Provo, UT 84602. *Infinite Cohen-Macaulay posets and non-Noetherian Stanley-Reisner rings.*

In the mid-seventies Hochster and Reisner related the algebraic and topological notions of Cohen-Macaulay rings and posets using the Stanley-Reisner ring. Reisner proved that for finite simplicial complexes, topologically Cohen-Macaulay is equivalent to the Stanley-Reisner ring being algebraically Cohen-Macaulay. Unfortunately, this idea only works for finite simplicial complexes because if the complex is infinite, the ring is no longer Noetherian, and the nice Cohen-Macaulay properties do not hold true in the non-Noetherian setting. Using local cohomology we will give a natural definition for Cohen-Macaulay modules over non-Noetherian rings and show that topologically Cohen-Macaulay is equivalent to algebraically Cohen-Macaulay for infinite yet finite dimensional simplicial complexes. (Received September 07, 2009)