**Commutative Algebra Semminar**

Speaker:   Winfried Bruns (Universität Osnabrück)

Title:   On a conjecture of Stanley

Time:   **Friday**, September 2 at 12:20–1:10 in **room 316**.

Abstract: We show that the Ehrhart $h$-vector of an integer Gorenstein polytope with a unimodular triangulation satisfies McMullen's $g$-theorem; in particular it is unimodal. This result generalizes a recent theorem of Athanasiadis (conjectured by Stanley) for compressed polytopes. It is derived from a more general theorem on Gorenstein affine normal monoids $M$: one can factor $K[M]$ ($K$ a field) by a "long" regular sequence in such a way that the quotient is still a normal affine monoid algebra. In the case of a polytopal Gorenstein normal monoid $E(P)$, this technique reduces all questions about the Ehrhart $h$-vector to a normal Gorenstein polytope $Q$ with exactly one interior lattice point. (Up to a translation these are the normal ones among the reflexive polytopes considered in connection with mirror symmetry.) If $P$ has a unimodular triangulation, then it follows readily that the Ehrhart $h$-vector of $P$ coincides with the $h$-vector of the boundary complex of a simplicial polytope, and the $g$-theorem applies.