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**Marie A. Vitulli\*** ([vitulli@math.uoregon.edu](mailto:vitulli@math.uoregon.edu)), Department of Mathematics, 1222 University of Oregon, Eugene, OR 97403-1222. *The Regularity Condition  $R_k$  of Serre.*

In this talk we will characterize those affine semigroup rings  $K[S]$  over an arbitrary field  $K$  which satisfy the regularity condition  $R_k$  of Serre. The structure of the “localizations” of the semigroup at various faces provides our first characterization and the second characterization is in terms of the face lattice of the positive cone  $\text{pos}(S)$  of  $S$ . The regularity conditions for these rings can be easily checked using the program NORMALIZ by Bruns and Koch. After introducing our characterization we turn our attention to the Rees algebras of a special class of monomial ideals in a polynomial ring over a field. In this special case, some of the characterizing criteria are always satisfied. We give examples of nonnormal monomial ideals whose Rees algebras satisfy  $R_k$ . (Received September 20, 2005)