

**Meeting:** 1006, Lubbock, Texas, SS 4A, Special Session on Homological Algebra and Its Applications

1006-13-162      **Luchezar Avramov** and **Srikanth Iyengar\*** (iyengar@math.unl.edu), 305 Avery Hall,  
Department of Mathematics, University of Nebraska, Lincoln, NE 68588. *Gaps in Hochschild  
(co)homology imply smoothness for commutative algebras.*

The talk will be concerned with the Hochschild homology and cohomology of a commutative algebra  $S$ , finitely generated over a field  $K$ , and with coefficients in an  $S$ -module  $M$ . I will discuss recent results of L. Avramov and myself that say if either the homology or the cohomology vanishes in sufficiently long intervals, then the  $K$ -algebra  $S$  is smooth at each prime ideal in the support of  $M$ .

A special case of this last result provides a strong affirmative answer to a question of Happel: For a (not necessarily commutative) algebra  $A$  of finite vector space dimension over a field  $K$ , does the eventual vanishing of Hochschild cohomology (with coefficients in  $S$ ) imply that  $S$  has finite global dimension? This is in sharp contrast to the general situation, where the answer is negative; the relevant counter-example has been constructed recently by Buchweitz, Green, Madsen, and Solberg. (Received February 14, 2005)