1011-13-259 **Luchezar L. Avramov*** (avramov@math.unl.edu), Department of Mathematics, University of Nebraska, Lincoln, NE 68588, **Ragnar-Olaf Buchweitz**, Universty of Toronto, **Srikanth Iyengar**, Universty of Nebraska, and **Claudia Miller**, Syracuse University. *Square-zero matrices over commutative local rings.* Preliminary report.

Let R be a commutative local ring with maximal ideal $\mathfrak{m}$ and let A be a $n \times n$ lower-triangular matrix with elements in $\mathfrak{m}$. Assume that there exists an integer s such that the following inclusions hold: $\mathfrak{m}^s \mathrm{K}er(A) \subseteq \mathrm{I}m(A) \subsetneq \mathrm{K}er(A)$. When R contains a field it will be shown that these conditions imply stringent restrictions on the size of the matrix A, on the number of its subdiagonal blocks, and on the sizes of these blocks. These results are linked to some of the standard 'Homological Conjectures' in commutative algebra. In particular, the restriction on R is due to the use of Hochster's big Cohen-Macaulay modules. The results themselves may used to prove the New Intersection Theorem of Peskine, Szpiro, Hochster, and Roberts, and are consistent with the Buchsbaum-Eisenbud-Horrocks Conjecture on ranks of syzygy modules. (Received August 29, 2005)