

1023-55-1038 **Robert Ghrist*** (ghrist@math.uiuc.edu), Department of Mathematics, 1409 W. Green St.,
Urbana, IL 61801. *Barcodes: The Persistent Topology of Data.*

The identification of the important qualitative features of noisy experimental data can be especially difficult when the data points reside in a dimension greater than three, or when the desired features are more subtle than connectivity. This lecture will outline the approach of Gunnar Carlsson et al., which utilizes techniques from computational algebraic topology to automatically extract the relevant global features from a cloud of data points. The principal mathematical tool is a parametrized homology theory called *persistent homology*, the computation of which yields a compact representation of features in the form of *barcodes*. These tools, though recently unveiled, have led already to some surprising ‘hidden’ features in an eight-dimensional data set of natural images. (Received September 24, 2006)