1046-57-1203   **Li Chen*** (`lchen@udc.edu`), 4200 Connecticut Ave, N.W., Department of Computer Science and IT, University of the District of Columbia, Washington, DC 20008, and **Yongwu Rong**. *A Fast Algorithm for Homology Groups in 3D Cubical Space.*

This talk presents a linear time algorithm to compute homology groups of 2D or 3D objects in 3D cubical space. Without pre-calculating triangulation of real data, our algorithm will directly use the geometrical and topological properties of digital space to get local surface points, calculate the the genus, and homology groups. This algorithm is in linear time. At the last, we will show the real data examples for medical image analysis. (Received September 15, 2008)