**Meeting:** 1004, Bowling Green, Kentucky, SS 4A, Special Session on Knot Theory and Its Applications

1004-65-166 **Akos Dobay*** (adobay@theorie.physik.uni-muenchen.de), Ludwig Maximilians University, Arnold Sommerfeld Center, 80333 Munich, Germany, **Yuanan Diao** (ydiao@uncc.de), UNC Charlotte, Department of Mathematics, Charlotte, NC 28223, and **Andrzej Stasiak** (Andrzej.Stasiak@unil.ch), UNIL, Laboratory of ultrastructural analysis, 1015 Lausanne, Switzerland. *The average inter-crossing number (ICN) between two equilateral random walks and polygons.*

In this talk, we will present the average inter-crossing number between two equilateral random walks and polygons. We show that the mean average inter-crossing number ICN between two equilateral random walks of length $n$ is of the form $a \cdot n + O(\ln n + \rho + \rho^2)\sqrt{n}$, where $a = \frac{3 \ln 2}{8} \approx 0.2599$ and $\rho \geq 0$ is the distance between the two base points of the two random walks and is relatively small compared to $n$. In the case of two random polygons of both length $n$ such that their starting points are of a distance $\rho$ apart, we were able to derive that the main term of the mean ICN is of the form $b \cdot n$ for small values of $\rho$, where $b \approx 0.687$. However we were not able to derive a bound for the error term due to technical difficulties. We will also present the mean ICN between two equilateral random walks and polygons of different lengths. The data provided by our simulations matches our theoretical predictions in a remarkably accurate way. (Received January 24, 2005)