Meeting: 1002, Pittsburgh, Pennsylvania, SS 7A, Special Session on Knots and Macromolecules

1002-92-196 **Akos Dobay*** (Akos.Dobay@lau.unil.ch), University of Lausanne, Building of Biology, Laboratory of Ultrastructural Analysis, 1015 Lausanne, Vaud, Switzerland, **Kenneth Millett** (millett@math.ucsb.edu), Santa Barbara, CA 93106-3080, **Jacques Dubochet** (Jaques.Dubochet.@lau.unil.ch), University of Lausanne, Building of Biology, Laboratory of Ultrastructural Analysis, 1015 Lausanne, Vaud, Switzerland, and **Andrzej Stasiak** (Andrzej.Stasiak@lau.unil.ch), University of Lausanne, Building of Biology, Laboratory of Ultrastructural Analysis, 1015 Lausanne, Vaud, Switzerland. *Linear random knots and their scaling behaviour.*

We will present a non-biased probabilistic method that allows us to consistently analyse knottedness of linear random walks with up to several hundreds of non-correlated steps. The method consists of analysing the spectrum of knots formed by multiple closures of the same open walk through random points on a sphere enclosing the walk. Knottedness of individual "frozen" configurations of linear chains is therefore defined by a characteristic spectrum of realizable knots. We will show that in the great majority of cases this method clearly defines the dominant knot type of a walk, i.e. the strongest component of the spectrum. In such cases, direct end-to-end closure creates a knot that usually coincides with the knot type that dominates the random closure spectrum. Interestingly, in a very small proportion of linear random walks, the knot type is not clearly defined. Such walks can be considered as residing in a border zone of the configuration space of two or more knot types. We will also discuss the scaling behaviour of linear random knots. (Received September 14, 2004)