

The Oliver Club

www.math.cornell.edu/~oliver/

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Smoothing Polymers

Arrangements of pennies as connected clusters are called **branched polymers**.

Topology provides a set of qualitative (but quantifiable) properties for analyzing spaces such as the totality of all possible branched polymers. Connectedness is the simplest topological property: Can any polymer be smooched into any other polymer? Is branched polymer space $\mathbf{BP}(n)$ connected [n = how many pennies]? Yes, but it's trickier than you might guess.

We were surprised to discover that $\mathbf{BP}(n)$ lacks a kind of 5-connectivity for $n > 7$. The set of all configurations with a cyclically-touching ring of 7 pennies jostling for access to a penny in the middle forms a 5-sphere that can't be smooched away. In topologese, $\pi_5(\mathbf{BP}(n))$ has positive rank, for $n > 7$.



I will discuss polymers and their connection to braids, mechanical linkages, configuration spaces and topology. This talk is based on joint work with Allen Hatcher and Rick Kenyon.

Thursday, August 28, 2008
at 4:25 PM in 406 Malott Hall

Refreshments will be served at 3:55 PM in the Mathematics Department lounge (532 Malott Hall).