Geometry Seminar
Tuesday, Nov 9, 2010
Room 201 WWH at 6:00 P.M.

Spontaneous Geometry via Circle Packing

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A circle packing P is a configuration of circles with a specified pattern of tangencies. The "pattern" is typically encoded as an abstract 2-complex K which triangulates an oriented topological surface. Any such K has an essentially unique canonical circle packing P_K known as the "maximal" packing for K. One "circle packs" K by computing and displaying P_K, which is now practical even for extremely large complexes K.

In this talk I will take the view that to circle pack K is to impose a geometry on it, and I'll explain why one can think of this as a "spontaneous" geometry. It is also visually pleasing, as I'll show with applications from graph embedding to brain imaging.

Surprisingly, these circle packing geometries are profoundly "conformal" in nature. I will claim — though it is not yet proven — that conformality is an "emergent" phenomenon when you circle pack random triangulations, and I'll deomonstrate with some live experiments.

The talk should be accessible to a wide audience: it will be largely image oriented and requires no particular background in the topic.

For more information please visit the seminar website at:
http://www.math.nyu.edu/seminars/geometry_seminar.html.