Friday 14 November 2014 at 14 : 15
Tea & Cookies starting at 13:00

BMS Loft, Urania, An der Urania 17, 10787 Berlin

Stephanie B. Alexander (*UIUC*)

source: http://commons.wikimedia.org/wiki/File:Hyperbolic_triangle.svg
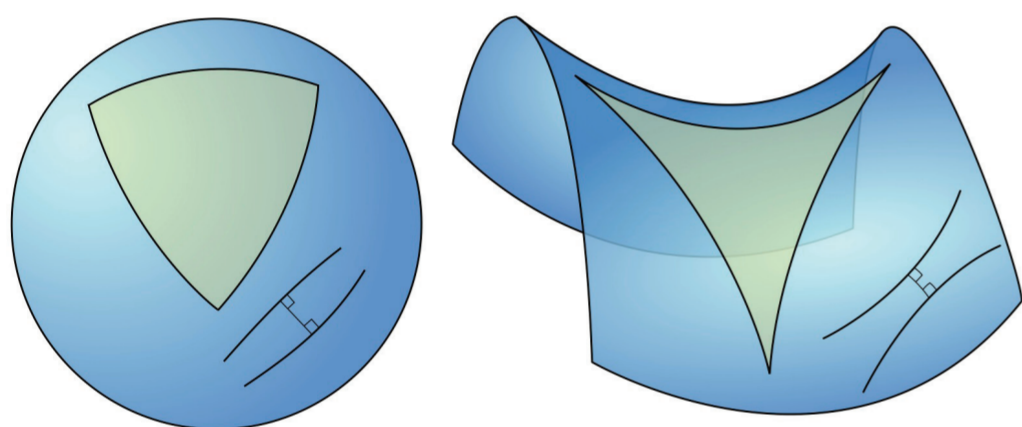
Alexandrov Geometry

Alexandrov spaces of curvature bounded either below or above grew out of intuitive geometric tools developed by Alexandrov in the 1940's to study surfaces in Euclidean 3-space. The two subjects "below" and "above" developed independently into revolutionary theories.

In the 1980's, Gromov's compactness theorem turned attention toward singular spaces that occur as limits of smooth Riemannian manifolds. Under a uniform lower sectional curvature bound, such limits are Alexandrov spaces of curvature bounded below. An explosion of work followed. More recently, these spaces informed Perelman's solution of the Poincare conjecture.

Alexandrov spaces of curvature bounded above play a role in Gromov's theory of hyperbolic groups. A beautiful recent application of these spaces was an estimate on billiard collisions that solved a famous problem in mechanics.

In her talk, Alexander will introduce the basics of Alexandrov geometry through examples, and present some personal favorite themes, applications and possible future directions.

Alexander received her PhD from the University of Illinois at Urbana–Champaign in 1967. She works in geometry of manifolds and Alexandrov spaces, with a current interest in space-times. In 2014 she was elected as a fellow of the American Mathematical Society "for contributions to geometry, for high-quality exposition, and for exceptional teaching of mathematics".

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