

# 学术报告

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报告题目：Characterizing ideal polyhedra in hyperbolic  $\mathbb{H}^3$ -space by combinatorial and angle structure

报告时间：2017 年 11 月 17 日 上午 10:30-11:30

报告地点：天津大学 6 号楼 108 教室

报告摘要：Around 1980, Thurston showed that “almost every” 3-manifold admits a complete hyperbolic metric. To get such a metric, he proposed to ideally triangulate the manifold and realize each tetrahedron as a hyperbolic ideal tetrahedron. He also gave a system of gluing equations in the shape parameter of these ideal tetrahedrons, whose solution corresponds to the complete hyperbolic metric.

In the 1990s, Casson discovered a powerful technique for solving Thurston's gluing equations. The main idea is to study the combinatorial structure of the triangulation and the dihedral angle structure of each tetrahedron. Following Casson's program, Rivin completely describes all convex ideal polyhedra by combinatorial and angle structures.

In this talk, we shall use combinatorial Ricci flow methods, initiated by Bennett Chow and Luo Feng, to approach Casson-Rivin's program. We shall extend Koebe-Andreev-Thurston's Circle Pattern Theorem, Rivin's theorem on ideal hyperbolic polyhedra and Chow-Luo's theory on combinatorial Ricci flows. Our results suggest an algorithm exponentially fast to find (ideal) circle patterns and ideal hyperbolic tetrahedrons with the given combinatorial type and dihedral angles. This is joint work with Hua Bobo and Zhou Ze.

