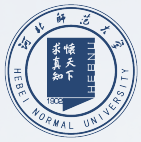

河北師范大学
HEBEI NORMAL UNIVERSITY

Conference on Frontiers of Mathematics

Remarkable Developments on Hyperbolic Geometry

前沿数学研讨会–双曲几何的绝妙进展

School of Mathematical Sciences, Hebei Normal University

August 31–September 3, 2026

Organizing Committee (in alphabet order)

Richeng Li	Hebei Normal University
Xiang Liu	Hebei Normal University
Xiaobing Sheng	The University of Osaka
Jun Wang	Hebei Normal University
Binbin Xu	Hebei Normal University
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Conference Hall Guanhe International Hotel

Dining Hall Guanhe International Hotel, 1st floor.

Address No. 18 Yuxiang Road, Yuhua District, Shijiazhuang, Hebei, China.

Remarkable Developments on Hyperbolic Geometry Conference Schedule

Time	Aug 31 Mon	Sept 1 Tue	Sept 2 Wed	Sept 3 Thu
8:30-9:20	Registration			
9:20-9:30	Opening			
9:30-10:10	Hugo Parlier	Inkang Kim	Youngju Kim	
10:10-10:50	Coffee Break			
10:50-11:30	Ara Basmajian	Xiaobing Sheng	Zhe Sun	
	Lunch			Departure
14:00-14:40	Nhat Minh Doan	Weixu Su	Fangting Zheng	
14:40-15:20	Coffee Break			
15:20-16:00	Yi Huang	Qiyu Chen	John Parker	
16:00-16:40	Coffee Break			
16:40-17:20	Lijie Sun	Yibo Zhang		
	Dinner			

Title and Abstract

Speaker: Ara Basmajian (City University of New York)

Title: Curves and the Inf spectrum of moduli space

Abstract: Given an essential closed curve on a closed surface of genus at least 2, its *inf length* is the infimum of its length among all hyperbolic metrics in Moduli space. It is not difficult to see that the inf length remains unchanged in the mapping class group orbit of a curve. By considering the inf length over mapping class group orbits of curves, we are naturally led to a spectrum of non-negative real numbers we call the *inf spectrum.* The focus of this talk will be on this spectrum.

This is joint work with Sayantika Mondal and Hugo Parlier.

Speaker: Qiyu Chen (South China University of Technology)

Title: Circular foliations and shear-radius coordinates on hyperbolic cone-surfaces

Abstract: We study the parametrizations and deformations of hyperbolic cone-surfaces of fixed topological type with variable positive cone angles. Inspired by Thurston's horocyclic foliations, we use geodesic triangulations and circular foliations to construct a coordinate atlas for their Teichmuller space. In these coordinates, we introduce peripheral stretch and interior anti-stretch deformations that vary the cone angles in a controlled manner. Their asymptotic limits are, respectively, a cusped hyperbolic metric and a circle-packed hyperbolic cone metric. As an application, we establish sharp upper bounds for admissible cone angles on the universally triangulable locus. This is joint work with Youliang Zhong.

Speaker: Nhat Minh Doan (Vietnam Academy of Science and Technology)

Title: The McShane-Rivin norm ball and some applications

Abstract: In 1995, McShane and Rivin showed that, on a hyperbolic once-punctured torus, the lengths of simple closed geodesics extend naturally to a norm on homology. Its unit ball gives a convex-geometric encoding of the simple length spectrum. In this talk, I will discuss recent developments arising from this viewpoint, including bounds on simple-length multiplicities, a connection with exponential Diophantine approximation, and new identities for simple closed geodesics.

Speaker: Yi Huang (BIMSA)

Title: Moduli Spaces of flippered hyperbolic surfaces

Abstract: We introduce flippered hyperbolic surfaces, and study the volumes of their moduli spaces. Particular focus will be given to the case of flippered disks and annuli.

Speaker: Inkang Kim (KIAS)

Title: TBA

Abstract: TBA.

Speaker: Youngju Kim (Konkuk University)
Title: Tubes and ball quotient
Abstract: In a real hyperbolic 2-manifold, the collar lemma says that a closed geodesic has an embedded tubular neighborhood whose width depends only on the length of the geodesic. In fact, a codimension 1 totally geodesic embedded submanifold in a real hyperbolic n-manifold also has such a tubular neighborhood that depends only on its $(n-1)$-volume. The width of the tubular neighborhood does not depend on the geometry of underlying manifold. On the other hand, a totally geodesic surface with codimension bigger than 1 in a hyperbolic manifold can be arbitrarily close to itself.

Here, we will discuss a tubular neighborhood theorem for an embedded complex codimension 1 submanifold in a complex hyperbolic n-manifold. We note that complex codimension 1 is real codimension 2. We provide an explicit estimate for this width that depends only on the codimension 1 volume of the embedded complex submanifold. We present two applications of this tubular neighborhood theorem: the first is a lower volume bound for such manifolds, and the second is an upper bound on the first eigenvalue of the Laplacian in terms of the geometry of the manifold.

Speaker: John Parker (Durham University)
Title: Complex hyperbolic triangle groups
Abstract: A complex hyperbolic triangle group is the group generated by three complex reflections each fixing a complex line in complex hyperbolic space. Unlike for the case of constant curvature, the angles between the lines do not determine the triangle: there is one extra real parameter. In 2001 Schwartz gave a series of conjectures about when such groups are discrete. I will survey this landscape and report on recent progress.

Speaker: Hugo Parlier (University of Fribourg)
Title: TBA
Abstract: TBA.

Speaker: Xiaobing Sheng (The University of Osaka)
Title: On subgroups of Brin-Thompson group nV - Go beyond hyperbolicity
Abstract: We study the combinatorial interpretations of elements of Brin-Thompson group nV via block pair calculus and we proved that nV is torsion locally finite and contains infinitely many copies of additive group of rationals $\mathbb{Q}$ for n greater than or equal to 2. This is a joint work with Sadayoshi Kojima (arXiv:2603.18410).

Speaker: Weixu Su (Sun Yat-sen University)
Title: Counting Saddle Connections on Hyperelliptic Translation Surfaces with a Slit

Abstract: We consider saddle connections on a translation surface in a hyperelliptic connected component of a stratum that do not intersect the interior of a distinguished saddle connection. For this restricted set of saddle connections, we show that it satisfies an $L(\log L)^{d-2}$ growth rate, where d is the complex dimension of the hyperelliptic stratum. The upper bound holds for all translation surfaces in the hyperelliptic stratum while the lower bound holds for almost every surface in the hyperelliptic stratum. The proof of the lower bound uses horocycle renormalization. This is a joint work with Aulicino, Masur and Pan.

Speaker: Lijie Sun (Osaka Metropolitan University)
Title: C-circles and R-circles for complex hyperbolic triangle groups
Abstract: The boundary of complex hyperbolic plane carries two distinguished families of circles, arising as the ideal boundaries of its two types of maximal totally geodesic subspaces: complex geodesics, whose boundaries are called C-circles (or chains), and totally real Lagrangian planes, whose boundaries are called R-circles. In this talk, we illustrate the boundary geometry of complex hyperbolic triangle groups using these two families of circles. First, we study C-Fuchsian subgroups of some non-arithmetic complex hyperbolic lattices. We identify the real hyperbolic orbifolds they uniformize, and visualize the resulting chain orbits in Heisenberg coordinates. Second, we study a special family of complex hyperbolic triangle groups, investigating limit sets that appear to be built from configurations of R-circles.

Speaker: Zhe Sun (University of Science and Technology of China)
Title: Punctured skein relation and quantization of higher decorated Teichmuller space
Abstract: Skein algebras are very important objects associated to the 3D quantum invariants. Roger and Yang introduced the punctured skein relations for the punctured surface, providing a natural quantization of the canonical Poisson structure on the decorated Teichmuller space. In this talk, we extend the canonical Poisson structure to the Fock–Goncharov higher decorated Teichmuller space associated with an arbitrary split semisimple algebraic group G with trivial center. For G=SL3 and G=SL4, we further construct an explicit quantization of these Poisson structures, yielding a natural generalization of Roger–Yang skein algebras. This is joint work in progress with Linhui Shen and Daping Weng.

Speaker: Yibo Zhang (Sun Yat-sen University)
Title: Ford domain of real elliptics in complex hyperbolic plane
Abstract: In complex hyperbolic space, an elliptic isometry f is real if it preserves a Lagrangian plane. For such an f, the ideal boundaries of all preserved Lagrangian planes are pairwise disjoint and form a torus, which we call the fixed torus of f. In this talk, we first consider a real elliptic f of finite order $n \geq 3$ and the Ford domain of $\langle f \rangle$, arising as the limit of Dirichlet domains as the centre point approaches the boundary. The explicit cellular structure of the Ford domain will be shown, provided its centre lies on the fixed torus of f.

The boundary of the Ford domain is asymptotic to a complex hyperbolic cylinder—the lateral boundary of the union of all Cygan spheres centred on an R-circle, where the sphere centred at x has radius $\sqrt{1+x^2}$. Using this cylinder as the geometric foundation of our method, we prove that a complex hyperbolic (n,∞,∞)-triangle group $\langle I_1, I_2, I_3\rangle$ is discrete, faithful, and has the Ford domain with the same cellular structure as that of the R-Fuchsian group if and only if W_A is loxodromic and the isometric spheres $I(W_B)$ and $I(W_B^{-1})$ are disjoint, where $W_A = I_1I_3I_2I_3$ and $W_B = I_1I_2I_3$. This Ford domain is required to be centred at the unique common fixed point of I_1 and I_2.

Speaker: Fangting Zheng (Xi'an Jiaotong-Liverpool University)

Title: Discrete embeddings of hyperbolic groups with Pontryagin-surface boundaries

Abstract: Let X_p be the quotient of the closed disk obtained by identifying boundary points under rotation through angle $2\pi/p$. For every $2 \leq p \leq 8$, we construct a hyperbolic right-angled Coxeter group with nerve homeomorphic to X_p that admits a discrete, faithful, convex cocompact reflection representation into $\mathrm{Isom}(\mathbf{H}^5)$, whose limit set is homeomorphic to the index-p Pontryagin surface Π_p. Dimension five is optimal, since Π_p does not embed in $\mathbb{S}^3$. For $p = 2, 3$, the constructions are analytic and yield cyclically symmetric infinite families. This is joint work with Jiming Ma and Junseo Yoon.

List of Participants

(in alphabet order)

No.	Name	Institution
1	Ara Basmajian	City University of New York
2	Changjie Chen	Binghamton University
3	Xiao Chen	Tsinghua University
4	Qiyu Chen	South China University of Technology
5	Diptaishik Choudhury	Tsinghua University, YMSC
6	Yumiao Cui	Hunan University of Science and Technology
7	Yanhong Ding	Hebei Normal University
8	Nhat Minh Doan	Vietnam Academy of Science and Technology
9	Suzhen Han	Hunan University
10	Yi Huang	BIMSA
11	Longsong Jia	Peking University
12	Inkang Kim	KIAS
13	Youngju Kim	Konkuk University
14	Qing Lan	Peking University
15	Chunlin Li	Zhejiang Normal University
16	Xuanliang Li	Guangdong University of Finance
17	Richeng Li	Hebei Normal University
18	Qiongling Li	Nankai University, CIM

19	Junjie Liao	Capital Normal University
20	Yixi Liao	Zhejiang Normal University
21	Dexie Lin	Chongqing University
22	Qing Liu	Nankai University
23	Juejun Liu	Zhejiang Normal University
24	Xiang Liu	Hebei Normal University
25	Sicheng Lu	Soochow University
26	Greg McShane	University of Grenoble-Alps
27	Dana Melnikova	Tsinghua University
28	Qingshan Mu	Guangxi University
29	John Parker	Durham University
30	Hugo Parlier	University of Fribourg
31	Xiaobing Sheng	The University of Osaka
32	Dianyi Song	Peking University
33	Weixu Su	Sun Yat-sen University
34	Zhentian Sun	Zhejiang Normal University
35	Lijie Sun	Osaka Metropolitan University
36	Zhe Sun	University of Science and Technology of China
37	Ser Peow Tan	National University of Singapore
38	Fei Tao	Peking University, BICMR

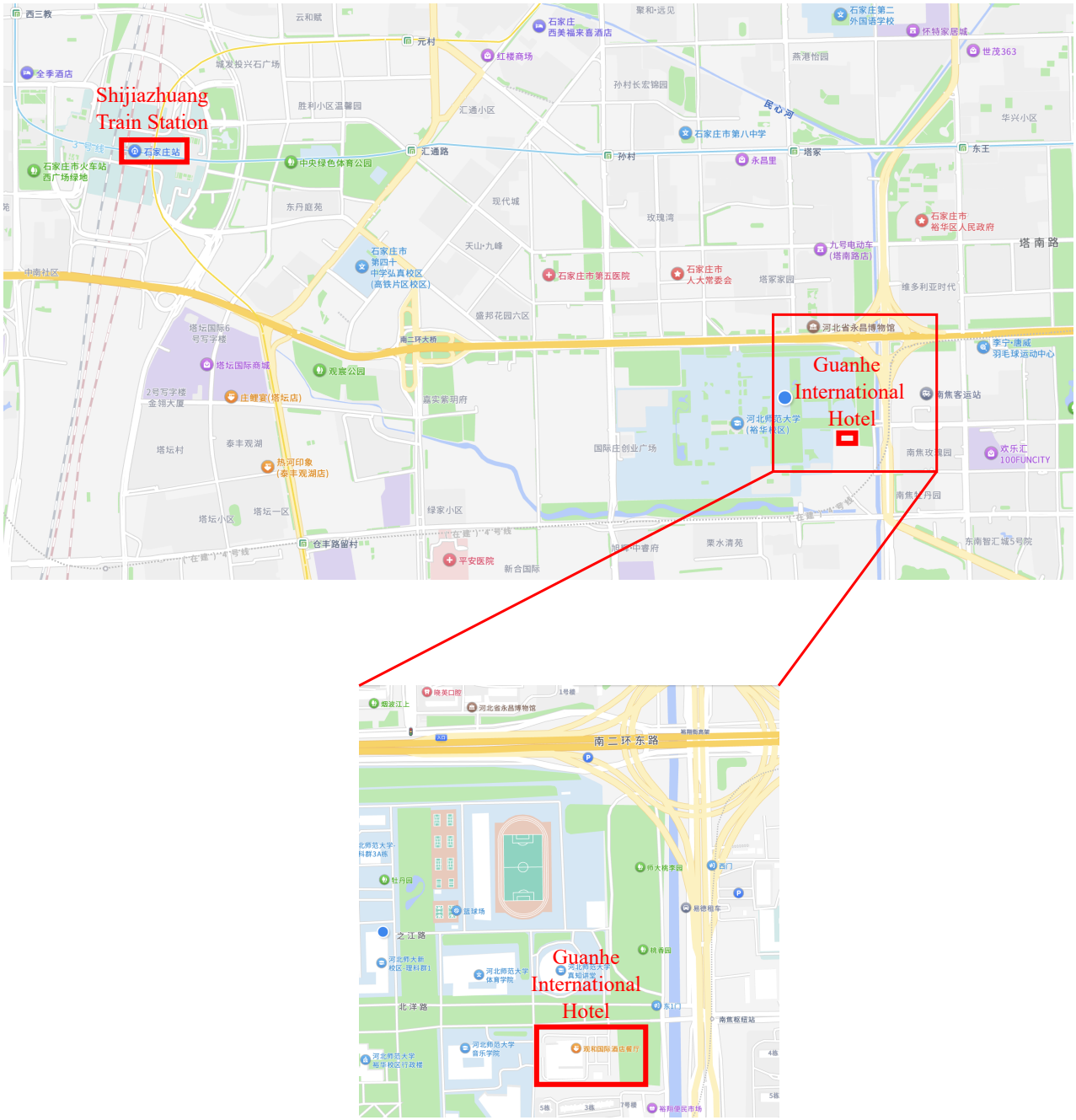
39	Ivan Telpukhovskiy	Tsinghua University, YMSC
40	Renxing Wan	East China Normal University
41	Erxiao Wang	Zhejiang Normal University
42	Zixi Wang	Zhejiang Normal University
43	Xu Wang	Tsignhua University
44	Jiajun Wang	Peking University
45	Jun Wang	Hebei Normal University
46	Jie Wu	Zhejiang Normal University
47	Baohua Xie	Hunan University
48	Binbin Xu	Hebei Normal University
49	Xianyang Xu	Zhejiang Normal University
50	Pengcheng Xu	Guangdong University of Finance
51	Mengmeng Xu	Huaqiao University
52	Xiaoyu Xu	Peking University
53	Chaodong Yang	Peking University
54	Qirong Yang	Beijing Normal University
55	Wenhui Yang	Southern University of Science and Technology
56	Yahui Yang	Zhejiang Normal University
57	Fang Yang	Hunan Institute of Engineering
58	Wenyuan Yang	Peking University

59	Liping Yuan	Hebei Normal University
60	Junming Zhang	Nankai University
61	Ying Zhang	Soochow University
62	Yibo Zhang	Sun Yat-sen University
63	Xuezhi Zhao	Capital Normal University
64	Fangting Zheng	Xi'an Jiaotong-Liverpool University
65	Shengmao Zhu	Zhejiang Normal University
66	Jie Zhu	Zhejiang Normal University

Travel Information

From Shijiazhuang Train Station to Guanhe International Hotel:

As you may see in the map below, the hotel where the conference will be held is quite closed to the train station. You may take a taxi in the train station or call a taxi through the ride hailing app "Didi". The trip takes about 10-15 minutes.

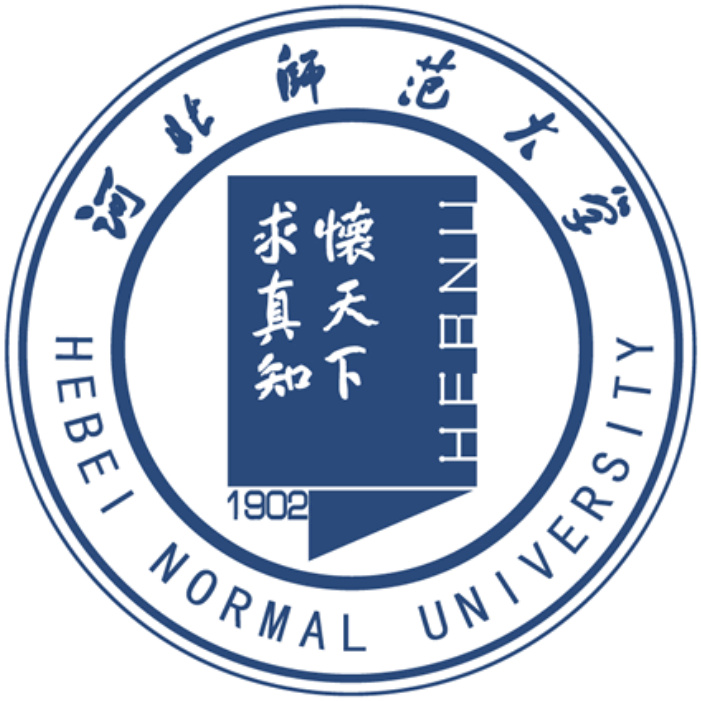


From Zhengding International Airport to Guanhe International Hotel:

You may take a taxi in the airport or call a taxi through the ride hailing app "Didi". The trip takes between 45 minutes and 1 hour. From the airport, the first part of the trip is on the highway. There will be a 4 CNY toll. You may also take the Airport Shuttle Bus No.3 and get off at the station "Nanjiao Passenger Transport Station" (南焦客运站), then walk to the hotel.

Some useful words for taking taxi:

- 请送我去观和国际酒店. Please take me to Guanhe International Hotel.
- 地址是裕华区裕翔路 18 号. The address is N 18 Yuxiang Road, Yuhua District.
- 酒店在南二环东路附近. The hotel is close to South Second Ring Road East.
- 酒店就在河北师大东门口. The hotel is right at the east gate of Hebei Normal University.
- 高速费 Toll Fee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