



丘成桐数学科学中心
YAU MATHEMATICAL SCIENCES CENTER



分析、几何与随机性研讨会

Analysis, Geometry and Randomness

会议时间 TIME

September 7-11, 2026

会议地点 VENUE

Room A-110, TSIMF

组织者 ORGANIZERS

Vladimir Markovic, Tsinghua University
Yunhui Wu (吴云辉), Tsinghua University

Find more information on tsimf.tsinghua.edu.cn



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The background is a deep blue with a complex, abstract pattern. A series of fine, light-blue lines and dots form a funnel or vortex shape, starting from a point at the top and expanding downwards. The overall effect is one of dynamic movement and depth.

About the conference

分析、几何与随机性研讨会

Analysis, Geometry and Randomness

Date

September 7-11, 2026

Venue

Room A-110, TSIMF

Organizers

Vladimir Markovic, Tsinghua University

Yunhui Wu(吴云辉), Tsinghua University

Abstract

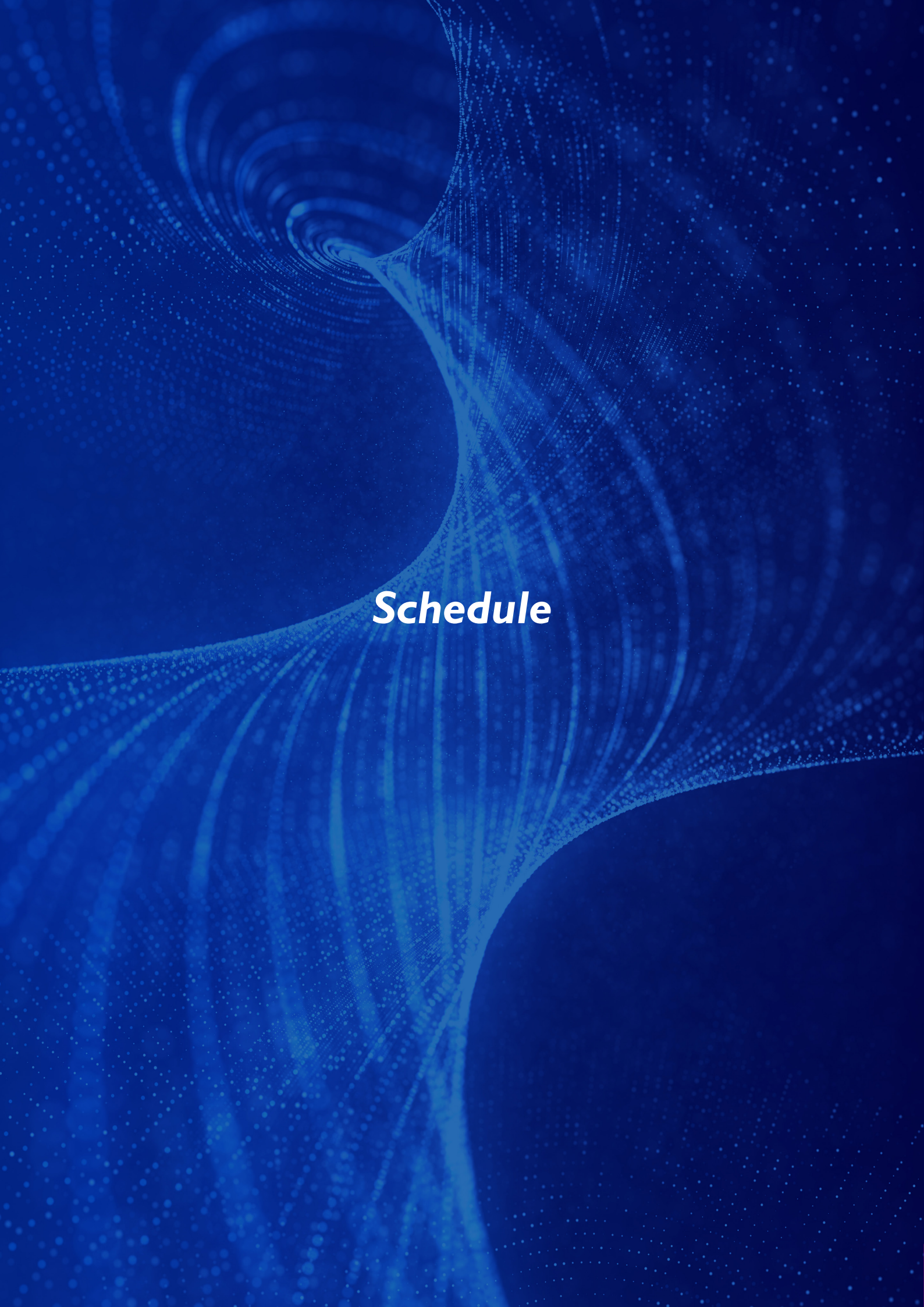
This conference will focus on the moduli space of surface group representations in Lie groups, and studying the geometric and spectral properties of random Riemann surfaces and their covers. Higher Teichmüller theory combines methods from minimal surfaces, non-Abelian Hodge correspondence, and dynamics, to explore surface group representations in higher rank semisimple Lie groups. On the other hand, the theory of random Riemann surfaces aims to identify and compute quantities which behave tamely in the setting of various random models.

This will be a four days conference. It brings together leading experts in low dimensional geometry, dynamics, and probability. Each distinguished speaker is expected to deliver a lecture in the conference. Beside the invited speakers, the participants of the conference will be graduate students and young postdocs from China. This event is expected to provide them with a comprehensive learning experience.

Participants

1. Shinpei BABA, Osaka University, Japan
2. Martin Bridgeman, Boston College, Chestnut Hill, USA
3. Diptaishik Choudhury, Yau Mathematical Sciences Center, Tsinghua University, China
4. Haoyang Dong (董皓阳), Qiuzhen College, Tsinghua University, China
5. Hao Fu (付浩), Tsinghua University, China
6. Yue Gao (高悦), Anhui Normal University, China
7. Yulin Gong (龚禹霖), School of Mathematics, University of Bristol, UK
8. Subhojoy Gupta, Indian Institute of Science, India
9. Xiaolong Han (韩肖垄), Shanghai Institute for Mathematics and Interdisciplinary Sciences, China
10. Siqi He (何思奇), Academy of Mathematics and Systems Science, Chinese Academy of Sciences, China
11. Xiang He (何翔), Yau Mathematical Sciences Center, Tsinghua University, China
12. Yuxin He (贺宇昕), School of Mathematical Sciences at Tel Aviv University, Israel
13. Jiankun Hou, Tsinghua University, China
14. Xushi Huang (黄序时), Qiuzhen College, Tsinghua University, China
15. Yi Huang(黄意), Beijing Institute of Mathematical Sciences and Applications, China
16. Zeno Huang/Zheng Huang, City University of New York, USA
17. Haoyang Jiang (姜昊扬), The School of Mathematics at Sun Yat-sen University, China
18. Fan Kang (康凡), Yau Mathematical Sciences Center, Tsinghua University, China
19. Mikhail Karpukhin, University College London, UK
20. Le Kuai (蒯乐), Qiuzhen College, Tsinghua University, China
21. Qionglin Li (李琼玲), Chern Institute of Mathematics, Nankai University, China
22. Kejie Lin (林柯杰), Sun Yat-sen University, China
23. Yiran Lin (林奕然), Qiuzhen College, Tsinghua University, China
24. Jinsong Liu (刘劲松), Academy of Mathematics and Systems Science, Chinese Academy of Sciences, China
25. Lixin Liu (刘立新), Sun Yat-sen University, China
26. Yi Liu (刘毅), Beijing International Center for Mathematical Research, Peking University, China
27. Qiliang Luo (罗琪亮), Tsinghua University, China
28. Vladimir Markovic, Tsinghua University, China
29. Greg McShane, Université Grenoble Alpes, France
30. Abderrahim Mesbah, Beijing Institute of Mathematical Sciences and Applications, China
31. Huiping Pan (潘会平), South China University of Technology, China
32. Yumo Pang (庞语默), Qiuzhen College, Tsinghua University, China

33. [Athanasios Papadopoulos](#), Institut de Recherche Mathématique Avancée, University of Strasbourg, France
34. [Hugo Parlier](#), University of Fribourg, Switzerland
35. [Bram Petri](#), Sorbonne Université, France
36. [Zeev Rudnick](#), Tel Aviv University, Israel
37. [Yang Shen \(沈洋\)](#), Hunan University, China
38. [Peter Smillie](#), Max Planck Institute for Mathematics in the Sciences, Germany
39. [Weixu Su \(苏伟旭\)](#), Sun Yat-sen University, China
40. [Tianyi Sun \(孙天意\)](#), Qiuzhen College, Tsinghua University, China
41. [Zhe Sun \(孙哲\)](#), University of Science and Technology of China, China
42. [Xueyuan Wan \(万学远\)](#), Chongqing University of Technology, China
43. [Shicheng Wang \(王诗晟\)](#), Peking University, China
44. [Zhongzi Wang \(王中子\)](#), Peking University, China
45. [Huaying Wei \(魏华影\)](#), Tianjin University, China
46. [Mike Wolf](#), Georgia Institute of Technology, USA
47. [Alex Wright](#), University of Michigan, USA
48. [Yunhui Wu \(吴云辉\)](#), Tsinghua University, China
49. [Sicheng Xian \(鲜思成\)](#), Qiuzhen College, Tsinghua University, China
50. [Binbin Xu \(徐彬斌\)](#), Hebei Normal University, China
51. [Yihui Xu \(许熠辉\)](#), Academy of Mathematics and Systems Science, Chinese Academy of Sciences, China
52. [Yuhao Xue \(薛宇皓\)](#), Fudan University, China
53. [Wenyuan Yang \(杨文元\)](#), Peking University, China
54. [Haohao Zhang \(张皓皓\)](#), Beijing International Center for Mathematical Research, China
55. [Ying Zhang \(张影\)](#), Soochow University, China
56. [Yigang Zheng \(郑以刚\)](#), Tsinghua University, China
57. [Ze Zhou \(周泽\)](#), Shenzhen University, China

The background is a deep blue with a complex, swirling pattern that creates a sense of depth and movement, resembling a tunnel or a vortex. A bright, glowing trail of particles or light streaks curves through the center, adding a dynamic element to the design.

Schedule

Time&Date	Monday (Sept. 7)	Tuesday (Sept. 8)	Wednesday (Sept. 9)	Thursday (Sept. 10)	Friday (Sept. 11)
7:30-8:30	Breakfast (60 minutes)				
Chair	Vlad Markovic	Shicheng Wang	Yunhui Wu	Wenyuan Yang	Free Discussion
8:30-9:25	Yi Liu	Mike Wolf	Zeev Rudnick	Siqi He	
9:30-10:25	Qiongling Li	Alex Wright	Bram Petri	Zhe Sun	
		Group Photo			
10:30-11:00	Coffee Break (within 30 minutes)				
Chair	Lixin Liu	Ying Zhang	Ze Zhou	Yuhao Xue	
11:00-11:55	Weixu Su	Mikhail Karpukhin	Yang Shen	Zeno Huang	
12:00-13:30	Lunch (90 minutes)				
Chair	Huaying Wei	Huiping Pan	Free Discussion	Yi Huang	Free Discussion
14:30-15:25	Subhojoy Gupta	Martin Bridgeman		14:00 - 14:55 Athanase Papadopoulos	
				15:00 - 15:55 Greg McShane	
15:30-16:00	Coffee Break (within 30 minutes)			16:00 - 16:30 Coffee Break	
Chair	Xueyuan Wan	Yue Gao		Xiaolong Han	
16:00-16:55	Shinpei BABA	Hugo Parlier		16:30 - 17:25 Peter Smillie	
17:30	Dinner (90 minutes)			Banquet 18:00-20:00	
		Student Talk			
		19:00 - 19:30 Yiran Lin			
		19:35 - 20:05 Jiankun Hou			
		20:10 - 20: 40 Qiliang Luo			

September 7, 2026 - Monday

Time	Name	Title
7:30-8:30	<i>Breakfast (60 minutes)</i>	
Chair	Vlad Markovic Tsinghua University, China	
8:30-9:25	Yi Liu(刘毅) Beijing International Center for Mathematical Research, Peking University, China	Entropy versus volume via Heegaard diagrams
9:30-10:25	Qiongling Li(李琼玲) Chern Institute of Mathematics, Nankai University, China	From cyclic Higgs bundles to Anosov representations
10:30-11:00	<i>Coffee Break (within 30 minutes)</i>	
Chair	Lixin Liu(刘立新) Sun Yat-sen University, China	
11:00-11:55	Weixu Su(苏伟旭) Sun Yat-sen University, China	The Carathéodory metric on Teichmüller space of genus two surface
12:00-13:30	<i>Lunch (90 minutes)</i>	
Chair	Huaying Wei(魏华影) Tianjin University, China	
14:30-15:25	Subhojoy Gupta Indian Institute of Science, India	Entropy and domination for quasi-Hitchin representations
15:30-16:00	<i>Coffee Break (within 30 minutes)</i>	
Chair	Xueyuan Wan(万学远) Chongqing University of Technology, China	
16:00-16:55	Shinpei BABA Osaka University, Japan	Bending Teichmüller spaces and character varieties
17:30	<i>Dinner (90 minutes)</i>	

September 8, 2026 - Tuesday

Time	Name	Title
7:30-8:30	Breakfast (60 minutes)	
Chair	Shicheng Wang(王诗成) Peking University, China	
8:30-9:25	Mike Wolf Georgia Institute of Technology, USA	Ray Structures on Teichmüller Space
9:30-10:25	Alex Wright University of Michigan, USA	Hierarchical hyperbolicity, ball quotients, and the moduli space of smooth cubic surfaces
Group Photo		
10:30-11:00	Coffee Break (within 30 minutes)	
Chair	Ying Zhang(张影) Soochow University, China	
11:00-11:55	Mikhail Karpukhin University College London, UK	Embedded non-orientable minimal surfaces in $\mathbb{S}^4$ via eigenvalue optimization
12:00-13:30	Lunch (90 minutes)	
Chair	Huiping Pan(潘会平) South China University of Technology, China	
14:30-15:25	Martin Bridgeman Boston College, Chestnut Hill, USA	Bending, entropy and proper affine actions of surface groups
15:30-16:00	Coffee Break (within 30 minutes)	
Chair	Yue Gao(高悦) Anhui Normal University, China	
16:00-16:55	Hugo Parlier University of Fribourg, Switzerland	The entropy spectrum of hyperbolic surfaces
17:30	Dinner (90 minutes)	
Student Talk		
19:00-19:30	Yiran Lin(林奕然) Qiuzhen College, Tsinghua University, China	
19:35-20:05	Jiankun Hou Tsinghua University, China	
20:10-20: 40	Qiliang Luo(罗琪亮) Tsinghua University, China	

September 9, 2026 - Wednesday

Time	Name	Title
7:30-8:30	<i>Breakfast (60 minutes)</i>	
Chair	Yunhui Wu(吴云辉) Tsinghua University, China	
8:30-9:25	Zeev Rudnick Tel Aviv University, Israel	Closed geodesics in homology classes on random hyperbolic surfaces of large genus
9:30-10:25	Bram Petri Sorbonne Université, France	Apollonian random manifolds and their bass notes
10:30-11:00	<i>Coffee Break (within 30 minutes)</i>	
Chair	Ze Zhou(周泽) Shenzhen University, China	
11:00-11:55	Yang Shen(沈洋) Hunan University, China	Nearly optimal spectral gaps for random Belyi surfaces
12:00-13:30	<i>Lunch (90 minutes)</i>	
13:30-17:00	<i>Free Discussion</i>	
18:00-20:00	<i>Banquet (120 minutes)</i>	

September 10, 2026 - Thursday

Time	Name	Title
7:30-8:30	Breakfast (60 minutes)	
Chair	Wenyuan Yang(杨文元) Peking University, China	
8:30-9:25	Siqi He(何思奇) Academy of Mathematics and Systems Science, Chinese Academy of Sciences, China	Calabi's Intrinsic Harmonicity, $\mathbb{Z}/2$ Harmonic 1-Forms, and Foliations of 3-Manifolds
9:30-10:25	Zhe Sun(孙哲) University of Science and Technology of China, China	Exponential volumes of moduli spaces of hyperbolic surfaces
10:30-11:00	Coffee Break (within 30 minutes)	
Chair	Yuhao Xue(薛宇皓) Fudan University, China	
11:00-11:55	Zeno Huang City University of New York, USA	Dichotomy for Minimal Surfaces in Hyperbolic 3-manifolds
12:00-13:30	Lunch (90 minutes)	
Chair	Yi Huang(黄意) Beijing Institute of Mathematical Sciences and Applications, China	
14:00-14:55	Athanase Papadopoulos Institut de Recherche Mathématique Avancée, University of Strasbourg, France	Thurston's metric on surfaces: The Euclidean case
15:00 - 15:55	Greg McShane Université Grenoble Alpes, France	Stable norm old and new
16:00 - 16:30	Coffee Break (within 30 minutes)	
Chair	Xiaolong Han(韩肖垄) Shanghai Institute for Mathematics and Interdisciplinary Sciences, China	
16:30 - 17:25	Peter Smillie Max Planck Institute for Mathematics in the Sciences, Germany	Towards a universal non-Abelian Hodge correspondence
17:30	Dinner (90 minutes)	

September 11, 2026 - Friday

Time	Name	Title
<i>7:30-8:30</i>	<i>Breakfast (60 minutes)</i>	
<i>8:30-12:00</i>	<i>Free Discussion</i>	
<i>12:00-13:30</i>	<i>Lunch (90 minutes)</i>	
<i>14:00-17:00</i>	<i>Free Discussion</i>	
<i>17:30</i>	<i>Dinner (90 minutes)</i>	

The background is a deep blue gradient. In the upper left, there is a circular vortex-like structure with concentric rings. A stream of fine, light blue particles or fibers flows from this vortex towards the center and then curves downwards and to the right, creating a sense of dynamic movement. The overall texture is grainy, suggesting a digital or scientific theme.

Titles and Abstracts

September 7, 2026 - Monday

Entropy versus volume via Heegaard diagrams

Yi Liu(刘毅)

Beijing International Center for Mathematical Research, Peking University, China

We introduce a notion called the Heegaard presentation length for closed orientable 3-manifolds. Using this as a bridge, we compare the entropy of a surface mapping class and the volume of its mapping torus, obtaining inequalities improving former results of Kojima.

From cyclic Higgs bundles to Anosov representations

Qionglin Li(李琼玲)

Chern Institute of Mathematics, Nankai University, China

Anosov representations generalize Fuchsian representations of surface groups, retaining key properties such as discreteness and faithfulness. Constructing new families of Anosov representations remains difficult. Via nonabelian Hodge theory, surface group representations can be studied through Higgs bundles. In this talk, I will present several families of cyclic Higgs bundles whose associated representations are Anosov, yielding new closed families of Anosov representations. This is based on work in progress with Samuel Bronstein and Colin Davalo.

The Carathéodory metric on Teichmüller space of genus two surface

Weixu Su(苏伟旭)

Sun Yat-sen University, China

Let $\mathcal{T}_{g,n}$ be the Teichmüller space of Riemann surfaces of genus g with n punctures. It is conjectured that the Teichmüller and Carathéodory metrics agree on a Teichmüller disk if and only if all the zeros of the corresponding holomorphic quadratic differential are of even order. The conjecture was proved by Gekhtman and Markovic for $\mathcal{T}_{0,5} \cong \mathcal{T}_{1,2}$. We confirm the conjecture for $\mathcal{T}_{2,0} \cong \mathcal{T}_{0,6}$. This is a joint work with Kejie Lin.

Entropy and domination for quasi-Hitchin representations

Subhojoy Gupta

Indian Institute of Science, India

A famous result of Bowen implies that the entropy or critical exponent of a quasi-Fuchsian representation strictly increases off the Fuchsian locus. I will explain how this follows from a

domination result comparing marked length spectra, together with the Anosov property of the geodesic flow. I will then discuss recent work proving analogues of this in the context of surface-group representations into $\mathrm{PSL}(n, \mathbb{C})$ that are quasi-Hitchin, obtained by bending or pleating deformations of Hitchin representations along a maximal lamination. In the higher-rank case our methods are linear algebraic, and involve weight-matrices of weighted planar networks. This represents joint work with Pabitra Barman.

Bending Teichmüller spaces and character varieties

Shinpei BABA

Osaka University, Japan

Let S be a closed oriented surface of genus at least two. The Teichmüller space of S can be identified with the space of discrete faithful representations of the fundamental group of S into $\mathrm{PSL}(2, \mathbb{R})$, called Fuchsian representations. Given a simple closed curve on S with positive weight (or a measured lamination), we can "bend" each Fuchsian representation along the curve by an angle equal to the weight, and obtain a representation of the surface group into $\mathrm{PSL}(2, \mathbb{C})$. This bending deformation induces a mapping from the Teichmüller space into the space of representations of the surface group into $\mathrm{PSL}(2, \mathbb{C})$. We discuss a few basic properties of this mapping.

If time permits, we also discuss a complexification of this mapping, constructed geometrically.

September 8, 2026 - Tuesday

Ray Structures on Teichmüller Space

Mike Wolf

Georgia Institute of Technology, USA

We depict harmonic map ray structures on Teichmüller space as a geometric transition between Teichmüller ray structures and Thurston geodesic ray structures. As an application, while there may be many Thurston metric geodesics between a pair of points in Teichmüller space, we find that by imposing an additional energy minimization constraint on the geodesics, thought of as limits of harmonic map rays, we select a unique Thurston geodesic through those points. We describe applications to the structure of the envelope of Thurston geodesics between a pair of points. (Joint work with Huiping Pan.)

Hierarchical hyperbolicity, ball quotients, and the moduli space of smooth cubic surfaces

Alex Wright

University of Michigan, USA

I will present on new work with Daniel Allcock that shows that the fundamental group of the moduli space of smooth complex cubic surfaces is a hierarchically hyperbolic group. The proof also applies to some other moduli spaces, and gives many new corollaries.

Embedded non-orientable minimal surfaces in $\mathbb{S}^4$ via eigenvalue optimization

Mikhail Karpukhin

University College London, UK

Given a Riemannian surface, the study of sharp upper bounds for Laplacian eigenvalues under the area constraint is a classical problem of spectral geometry going back to J. Hersch, P. Li, S.-T. Yau and N. Nadirashvili. The particular interest in this problem stems from the remarkable fact that the optimal metrics for such bounds arise as metrics on minimal surfaces in spheres. I will describe a surprisingly effective method of constructing new minimal surfaces based on the eigenvalue optimisation with a prescribed symmetry group, which among other things can be used to construct families of examples of embedded non-orientable surfaces in 4-sphere of area below 8π for any given genus. Furthermore, some of the highly symmetric families constructed in this way exhibit fascinating properties that could be compared with those of Lawson's $\xi_{k,1}$ -surfaces.

Bending, entropy and proper affine actions of surface groups

Martin Bridgeman

Boston College, Chestnut Hill, USA

Let $QF(S)$ be the space of quasifuchsian representations for a closed surface S and $h : QF(S) \rightarrow \mathbb{R}$ the function given by taking the hausdorff dimension of the limit set. Ruelle used thermodynamics to show that h is analytic and Bowen proved that $h(\rho) = 1$ if and only if ρ is Fuchsian. Margulis gave examples of proper affine actions of free groups on $\mathbb{R}^3$, which are now called Margulis space times. Recently Danciger, Guéritaud and Kassel gave the first examples of proper affine actions of a closed surface group producing a quasifuchsian group $\rho \in QF(S)$ such that there is a proper affine action on $\mathfrak{sl}(2, \mathbb{C}) \simeq \mathbb{R}^6$ with linear part $\text{Ad}(\rho)$. We show that there is a uniform neighborhood U of the Fuchsian locus so that every critical point of h in U lies on the Fuchsian locus. We further show that there is a smaller uniform neighborhood V of the fuchsian locus in quasifuchsian space $QF(S)$ such that for every representation $\rho \in V$ which is not fuchsian, there is a proper affine action on $\mathfrak{sl}(2, \mathbb{C}) \simeq \mathbb{R}^6$ with linear part $\text{Ad}(\rho)$. The main ingredients are the new notion of a moderately bent quasifuchsian manifold and the use of bending deformations to produce the non-critical directions and the proper affine actions. This work is joint with Dick Canary and Andres Sambarino

The entropy spectrum of hyperbolic surfaces

Hugo Parlier

University of Fribourg, Switzerland

The study of closed geodesics on hyperbolic surfaces sits at the crossroads of geometric topology and dynamics and often has links to geometric probability and number theory. This talk will discuss new quantitative bounds for the growth of the number of closed geodesics on surfaces with geodesic boundary. The main theme is that coarse geometric data, such as boundary length, width, or diameter, already strongly constrain geodesic growth and entropy.

The talk will also introduce the entropy spectrum of a hyperbolic surface, consisting of the entropies of its subsurfaces. This leads to the study of gaps in the entropy spectrum, rigidity phenomena, and discreteness results that reveal new geometric features of subsurface dynamics.

This is joint work with Ara Basmajian.

September 9, 2026 - Wednesday

**Closed geodesics in homology classes on
random hyperbolic surfaces of large genus**

Zeev Rudnick
Tel Aviv University, Israel

We study the distribution of closed geodesics in homology classes on random hyperbolic surfaces of large genus. Viewing the surface as a random point in moduli space equipped with the Weil–Petersson probability measure, we investigate the fluctuations of the number of closed geodesics of bounded length in homology classes, and compare it with what is conjectured for primes in arithmetic progressions.

Apollonian random manifolds and their bass notes

Bram Petri
Sorbonne Université, France

I will speak about joint work with Will Hide, Anna Roig Sanchis and Joe Thomas. We use a model of random hyperbolic 3-manifolds to investigate the set of all possible spectral gaps of hyperbolic 3-manifolds of finite volume.

Nearly optimal spectral gaps for random Belyi surfaces

Yang Shen(沈洋)
Hunan University, China

we show that a random hyperbolic surface in the Brooks-Makover model has a spectral gap greater than $\frac{1}{4} - \frac{c}{\log n}$ for some universal constant $c > 0$, confirming the nearly optimal spectral gap conjecture in this model. It is a joint work with Yunhui Wu.

September 10, 2026 - Thursday

Calabi's Intrinsic Harmonicity, $\mathbb{Z}/2$ Harmonic 1-Forms, and Foliations of 3-Manifolds

Siqi He(何思奇)

Academy of Mathematics and Systems Science, Chinese Academy of Sciences, China

$\mathbb{Z}/2$ harmonic 1-forms, introduced by Taubes as limiting objects in the compactness theory of gauge-theoretic equations, play an important role in differential geometry and gauge theory. On 3-manifolds, they are closely related to measured foliations, harmonic maps to $\mathbb{R}$ -trees, and the Morgan-Shalen compactification of the $SL(2, \mathbb{C})$ character variety. In this talk, I will explain a two-valued analogue of Calabi's intrinsic harmonicity theorem, which gives an intrinsic criterion for when a closed two-valued 1-form can be made harmonic by a suitable choice of metric. I will then describe how this viewpoint leads to Calabi surgery, a flexible method for constructing and modifying $\mathbb{Z}/2$ harmonic 1-forms, and discuss some of its applications. This talk is based on joint work with Jiahuang Chen and Dashen Yan.

Exponential volumes of moduli spaces of hyperbolic surfaces

Zhe Sun(孙哲)

University of Science and Technology of China, China

Mirzakhani found a remarkable recursive formula for the volumes of the moduli spaces of the hyperbolic surfaces with geodesic boundary, and the recursive formula plays very important role in several areas of mathematics: topological recursion, random hyperbolic surfaces etc.

We consider some more general moduli spaces $\mathcal{M}_{\mathbb{S}}(K, L)$ where the hyperbolic surfaces would have crown ends and horocycle decorations at each ideal points. But the volume of the space $\mathcal{M}_{\mathbb{S}}(K, L)$ is infinite when $\mathbb{S}$ has the crown ends. To fix this problem, we introduce the exponential volume form given by the volume form multiplied by the exponent of a canonical function on $\mathcal{M}_{\mathbb{S}}(K, L)$. We show that the exponential volume is finite. And we prove the recursion formulas for the exponential volumes, generalising Mirzakhani's recursions for the volumes of moduli spaces of hyperbolic surfaces. We expect the exponential volumes are relevant to the open string theory. This is a joint work with Alexander Goncharov.

Dichotomy for Minimal Surfaces in Hyperbolic 3-manifolds

Zeno Huang

City University of New York, USA

In complete hyperbolic 3-manifolds, there are often abundant closed minimal surfaces. I will present some dichotomy results and describe some open problems on the existence and abundance

of minimal surfaces in degenerate hyperbolic 3-manifolds. Much of the talk is based on joint work with Coskunuzer, Lowe and Vargas Pallet.

Thurston's metric on surfaces: The Euclidean case

Athanase Papadopoulos

Institut de Recherche Mathématique Avancée, University of Strasbourg, France

I will explain recent results on Euclidean analogues of Thurston's metric on Teichmüller space. These analogues include metrics on spaces of Euclidean triangles and more generally on spaces of surfaces obtained by gluing Euclidean pieces. In each case, I will describe the geodesics, the infinitesimal Finsler structure and the isometries of these metrics. I will point out relations with the classical Thompson metric. The results are obtained in collaboration with Hideki Miyachi, Ken'ichi Ohshika and Ismail Saglam. The work gives rise to several new open questions.

Stable norm old and new

Greg McShane

Université Grenoble Alpes, France

In the 90s McShane and Rivin studied the stable norm on the first homology of a once punctured torus equipped with a hyperbolic metric. - they used it to count simple closed geodesics on the torus - studied the variation of its area as a function on moduli space- classified the points on the boundary of the unit ball of the stable norm.

Hines in 2019 gave a new proof of the McShane Identity using a rather mysterious function defined on the rationals. We'll explain how his proof can be interpreted in terms of the stable norm and how this relates to recent work of Doan and his collaborators.

Motivated by this work McShane in 2021 gave a (unified) proof of Aigner's conjectures for Markoff numbers labelled by rationals.

Finally we'll discuss unpublished work of Montealegre (Montpellier thesis 2024) for the stable norm of translation surfaces.

Towards a universal non-Abelian Hodge correspondence

Peter Smillie

Max Planck Institute for Mathematics in the Sciences, Germany

The resolution of the Schoen conjecture by Markovic established a bijection between universal Teichmüller space - the space of quasimetric homeomorphisms of the circle up to projective equivalence - and the space of bounded quadratic differentials on the hyperbolic plane. This can be seen as a 'universal' generalization of the non-Abelian Hodge correspondence between Higgs bundles and flat connections for the group $SL_2\mathbb{R}$ over the Hitchin section. I will explain a partial

generalization of this picture from $SL_2\mathbb{R}$ to $SL_n\mathbb{R}$ in joint work with Max Riestenberg, and a conjectural relationship with work of Li and Mochizuki on the Higgs bundles side.



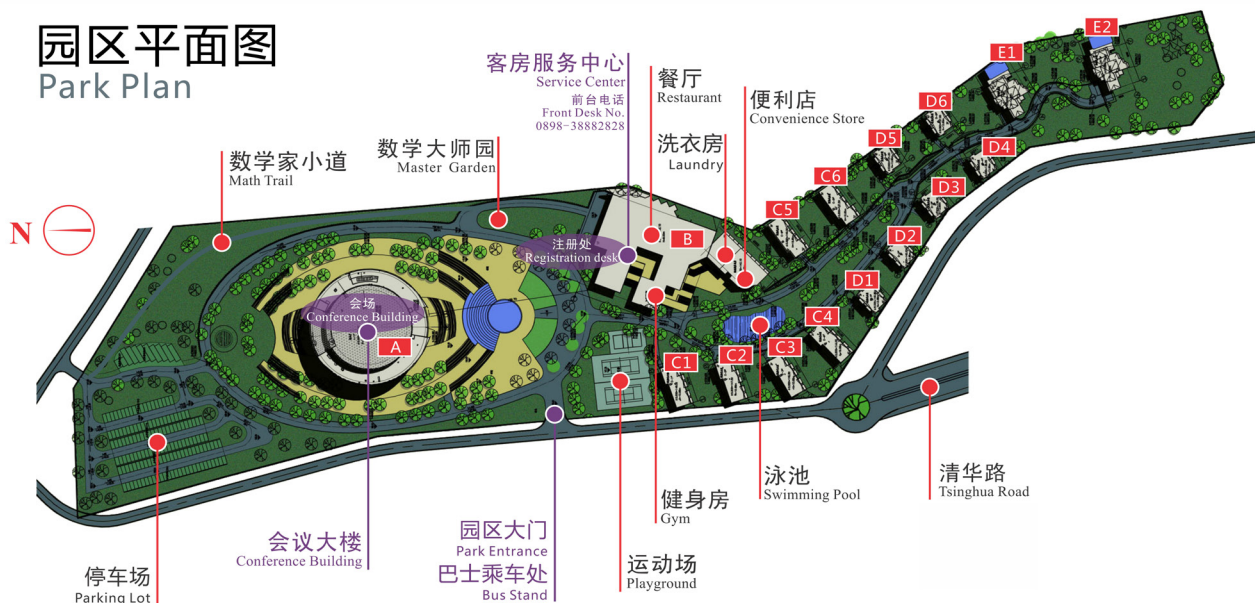
Welcome to TSIMF



The facilities of TSIMF are built on a 23-acre land surrounded by pristine environment at Phoenix Hill of Phoenix Township. The total square footage of all the facilities is over 29,000 square meter that includes state-of-the-art conference facilities (over 10,000 square meter) to hold many international workshops simultaneously, two reading rooms of library, a guest house (over 10,000 square meter) and the associated catering facilities, a large swimming pool, gym and sports court and other recreational facilities.

Management Center of Tsinghua Sanya International Forum is responsible for the construction, operation, management and service of TSIMF. The mission of TSIMF is to become a base for scientific innovations, and for nurturing of innovative human resource; through the interaction between leading mathematicians and core research groups in pure mathematics, applied mathematics, statistics, theoretical physics, applied physics, theoretical biology and other relating disciplines, TSIMF will provide a platform for exploring new directions, developing new methods, nurturing mathematical talents, and working to raise the level of mathematical research in China.

About Facilities



Registration

Conference booklets, room keys and name badges for all participants will be distributed at the front desk. Please take good care of your name badge. It is also your meal card and entrance ticket for all events.

Park-Wide WiFi Information

SSID:TSIMF-WiFi

Password:tsimf123



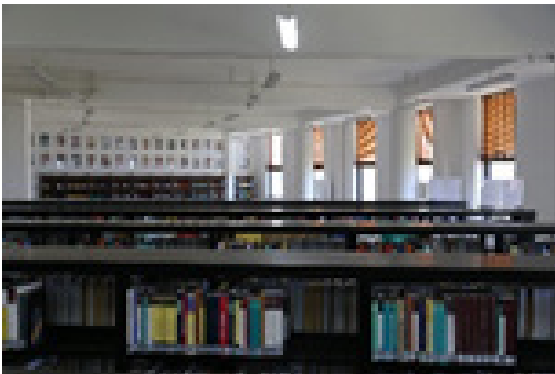
Family rooms are also equipped with kitchen and refrigerator.

Guest Room

All the rooms are equipped with: free Wi-Fi, TV, air conditioning and other utilities.



Library



Opening Hours: 09:00-22:00

TSIMF library is available during the conference and can be accessed by using your room card. There is no need to sign out books but we ask that you kindly return any borrowed books to the book cart in library before your departure.



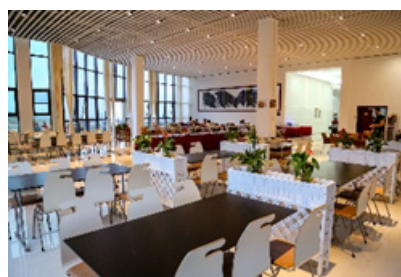
In order to give readers a better understanding of the contributions made by the Fields Medalists, the library of Tsinghua Sanya International Mathematics Forum (TSIMF) instituted the Special Collection of Fields Medalists as permanent collection of the library to serve the mathematical researchers and readers.

So far, there are 271 books from 49 authors in the Special Collection of Fields Medalists of TSIMF library. They are on display in room A220. The participants are welcome to visit.



Restaurant

All the meals are provided in the restaurant (Building B1) according to the time schedule.



Breakfast 07:30-08:30

Lunch 12:00-13:30

Dinner 17:30-19:00

Laundry

Opening Hours: 24 hours

The self-service laundry room is located in the Building(B1).



Gym

Opening Hours: 24 hours

The gym is located in the Building 1 (B1), opposite the reception hall. The gym provides various fitness equipment, as well as pool tables, tennis tables etc.



Playground

Playground is located on the east of the central gate. There you can play basketball, tennis and badminton. Meanwhile, you can borrow table tennis, basketball, tennis balls and badminton at the reception desk.

Swimming Pool

Please enter the pool during the open hours, swimming attire and swim caps are required, if you feel unwell while swimming, please stop swimming immediately and get out of the pool. The depth of the pool is 1.2m-1.8m.

Opening Hours: 13:00-14:00 18:00-21:00



Free Shuttle Bus Service at TSIMF

We provide free shuttle bus for participants and you are always welcome to take our shuttle bus, all you need to do is wave your hands to stop the bus.

Destinations: Conference Building, Reception Room, Restaurant, Swimming Pool, Hotel etc.



Contact Information of Administration Staff**Location of Conference Affairs Office: Room 104, Building A**

Tel: 0086-898-38263896

Conference Affairs :

Sarah 陈媛姗

Tel/Wechat: 0086-130-2983-0780

Email: tsimf@tsinghua.edu.cn



Shouxi He 何守喜

Tel/Wechat: 0086-186-8980-2225

Email: heshouxi@tsinghua.edu.cn

**Location of Accommodation Affairs Office: Room 200, Building B1**

Tel: 0086-898-38882828

Accommodation Manager: Ms. Li YE 叶莉

Tel/Wechat: 0086-139-7679-8300

Email: yel@tsinghua.edu.cn



*Reception duty hours: 7:00-23:00, chamber service please call: 0086-38882828 (exterior line) 80000 (internal line)

*Room maintainer night duty hours: 23:00-7:00, if you need maintenance services, please call: 0086-38263909 (exterior line) 30162 (internal line)

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