



**Recent Advances in Convex Geometry and
Geometric Functional Analysis**

凸几何与几何泛函分析的最新进展研讨会

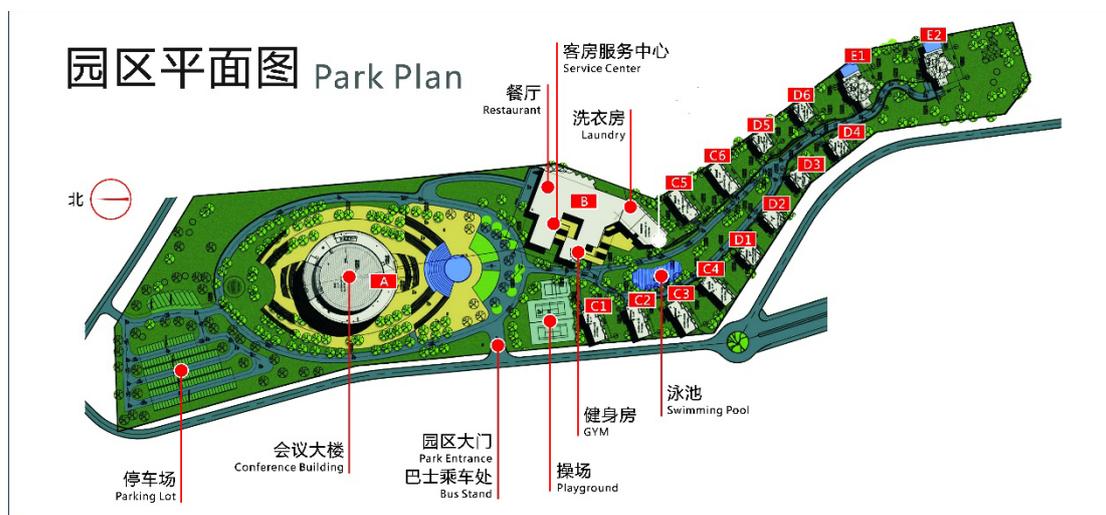
May 14- 18, 2018

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 libraries, 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.

Mathematical Sciences Center (MSC) of Tsinghua University, assisted by TSIMF's International Advisory Committee and Scientific Committee, will take charge of the academic and administrative operation 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 Registry. Please take good care of your name badge. It is also your meal card and entrance ticket for all events.



Guest Room



Conference Center can receive about 378 people having both single and double rooms, and 42 family rooms.

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

Family rooms are also equipped with kitchen and refrigerator.

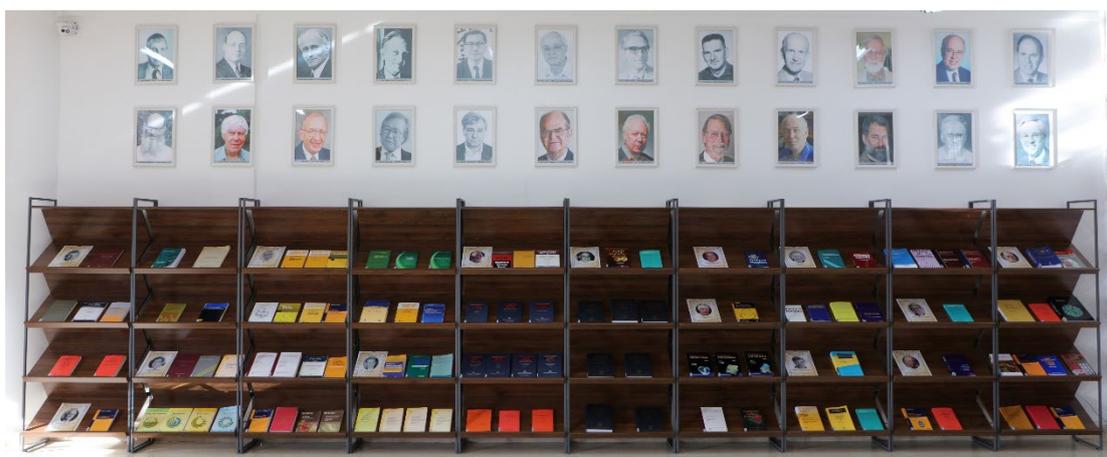


Library



Opening Hours: 09:00am-22:00pm

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 210 books from 43 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 Chinese 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 1 (B1).

Gym

The gym is located in the Building 1 (B1), opposite to the reception hall. The gym provides various fitness equipment, as well as pool tables, tennis tables and 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 note that there are no lifeguards. We will not be responsible for any accidents or injuries. In case of any injury or any other emergency, please call the reception hall at +86-898-38882828.



Outside Shuttle Service

We have shuttle bus to take participants to the airport for your departure service. Also, we would provide transportation at the Haihong Square (海虹广场) of Howard Johnson for the participants who will stay outside TSIMF. If you have any questions about transportation arrangement, please feel free to contact Ms. Li Ye (叶莉), her cell phone number is (0086)139-7679-8300.

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 Staffs

Location of Conference Affair Office: Room 104, Building A

Tel: 0086-898-38263896

Technical Support: Shouxi, He 何守喜

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Accommodation Manager: Ms. Li Ye 叶莉

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Prof.Xuan Gao 高瑄

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Schedule for "Recent Advances in Convex Geometry and Geometric Functional Analysis"					
Time & Date	Monday (May 14)	Tuesday (May 15)	Wednesday (May 16)	Thursday (May 17)	Friday (May 18)
7:30-8:30	<i>Breakfast (60 minutes)</i>				
<i>Chair</i>	Jiazuo Zhou	Deping Ye	TBD	TBD	TBD
9:00-9:30	Alexander Litvak, Circular law for sparse random regular digraphs	Jin Li, Function-valued valuations	Martin Henk, Remarks on the log- Minkowski problem	Jian Lu, Existence of solutions to the prescribed centroaffine curvatures problem	Dmitry Faifman, Crofton formulas in symplectic, contact and Riemannian geometries
9:40-10:10	Kateryna Tatarko, An upper bound on the smallest singular value of a square random matrix	Ben Li, Loewner function of log concave functions	Deane Yang, The dual Minkowski problem	Dongmeng Xi, Cosine transforms on Grassmannians and related inequalities	Youjiang Lin, Affine Orlicz-Polya-Szego principle for log-concave functions
10:10-10:40	<i>Coffee Break (within 30 minutes)</i>				
<i>Chair</i>	Jiazuo Zhou	Deping Ye	TBD	TBD	TBD
10:40-11:10	Du Zou, Convex Bodies with Identical John and LYZ Ellipsoids	Bentuo Zheng, Banach Spaces with the Ball Covering Property	Sudan Xing, The dual Orlicz-Minkowski problem	Galya Livshyts, On the dimensional Brunn-Minkowski inequality	Olaf Mordhorst, Duality of Floating and Illumination Bodies
11:20-11:50	Songjun Lu, L _p John ellipsoids associated with spherical measures	Carsten Schütt, Flags and Floating Bodies	Jiakun Liu, A boundary problem for Monge-Ampere equations	Denghui Wu, L _p -Brunn-Minkowski inequalities for general measures and their applications	Baocheng Zhu, The Orlicz-Petty bodies
12:00-13:30	<i>Lunch (90 minutes)</i>				
<i>Chair</i>	Elisabeth Werner	TBD	TBD	TBD	TBD
13:40-14:10	Julian Haddad, Sharp affine Sobolev type inequalities and the Basemann- Petty centroid inequality	Florian Besau, Spherical Floating Bodies and Floating Area Measures	Free Discussion 13:30-17:00 天涯海角		
14:20-15:00	Qingzhong Huang, On the Loomis-Whitney inequality for isotropic measures	Thomas Hack, Spherical centroid bodies			
15:00-15:30	<i>Coffee Break (within 30 minutes)</i>				
<i>Chair</i>	Elisabeth Werner	TBD	TBD	TBD	TBD
15:30-16:00	Philipp Kniefacz, Affine vs. Euclidean Sobolev inequalities	Ning Zhang, A solution to the problem of bodies with congruent sections or projections	Matthew Stephen, Some characterizations of origin- symmetry		
16:10-16:40	Niufa Fang The functional L _p Minkowski inequality	Liping Yuan, On S ⁿ -convexity and related properties			
17:30	<i>Dinner</i>				
	Banquet 18:00-20:00			<i>Dinner</i>	

Florian Besau,

Title: Spherical Floating Bodies and Floating Area Measures

Abstract: Given a convex body in Euclidean space, a convex floating body is obtained by cutting off caps that violate a fixed volume bound. This is a classic affine construction that can be traced back to Dupin in the 19th century and has been studied extensively in the past century. Blaschke used the floating body to introduce the now classical notion of affine surface area for smooth convex bodies in dimension two and three. Blaschke's observation, that the volume derivative of the floating body converges to the affine surface area as the volume of the cut-offs goes to zero, was extended for smooth convex bodies to all dimensions by Leichtweiss and finally to all convex bodies by Schuett & Werner.

Recently, together with Werner, we gave a natural analog for the convex floating body of spherical convex bodies, i.e., convex closed subsets of the n -dimensional unit sphere. The (spherical) volume derivative of this spherical floating body converges to a new spherical surface area measure, the spherical floating area.

It was observed by Barany & Larman that the volume difference of the (Euclidean) floating body for polytopes is of a higher order in the volume of the cut-offs. Their results were strengthened by Schuett, who established that for polytopes the total number of complete flags, a combinatoric invariant, is the first factor in the asymptotic expansion. In current work together with Schuett and Werner, we observe that the same behavior holds true for the spherical floating body of spherical polytopes.

In this talk I am going to present a brief outline of the many relations between the Euclidean and spherical floating body and address some remaining open questions. (Based on joint work in part with Werner and Schuett & Werner).

Niufa Fang

Title: The functional L_p Minkowski inequality

Abstract: The L_p Minkowski inequality, an extension of the L_p isoperimetric inequality, is a basic inequality in the L_p -Brunn-Minkowski theory. It is well known that the L_p isoperimetric inequality is equivalent to the L_p Sobolev inequality. Does there exist a Sobolev style inequality that implies the L_p Minkowski inequality? In this talk, we will construct a Sobolev style inequality that is equivalent to the L_p Minkowski inequality. This work is joined with W. Xu, J. Zhou and B. Zhu.

Dmitry Faifman

Title: Crofton formulas in symplectic, contact and Riemannian geometries

Abstract. The classical Crofton formula of Euclidean geometry -computing the length of a plane curve by counting its intersections with straight lines - lies in the foundation of modern integral geometry. More recently, several incarnations of Crofton formulas were established in various geometries, such as hermitian and pseudo-Euclidean spaces. In the talk, I will present the Crofton integral in three different settings - a hypersurface in Euclidean space, the linear symplectic space, and the contact sphere. The three turn out to be linked through the integral geometry of the Heisenberg algebra.

Thomas Hack

Title: Spherical centroid bodies

Abstract: Going back to C. Dupin and W. Blaschke, the notion of Euclidean centroid bodies, along with their associated isoperimetric inequalities, forms a classical part of the theory of convex bodies. In this talk, we give a new definition of centroid bodies in spherical space, explore their basic properties, and discuss isoperimetric problems associated with them. (joint work with F. Besau, P. Pivovarov, and F. E. Schuster)

Julian Haddad,

Title: Sharp affine Sobolev type inequalities and the Busemann-Petty centroid inequality

Abstract: We show that the L_p Busemann-Petty centroid inequality for convex sets provides an elementary proof of many affine-invariant functional inequalities in a unified approach. The inequalities are Sharp and the extremal functions are characterized in several cases.

we develop a technique of bounding intermediate singular values of A_n based on studying random normals to rowspaces. This is a joint work with A. Lytova, K. Tikhomirov, N. Tomczak-Jaegermann, and P. Youssef.

Jiakun Liu

Title: A boundary problem for Monge-Ampere equations.

Abstract: In this talk, we will present a recent result on the global $C^{2,\alpha}$ and $W^{2,p}$ regularity for the Monge-Ampere equation subject to a natural boundary condition arising in optimal transportation, which also has wide range of applications, such as in convex geometry, reflector design, meteorology and fluid mechanics. This is a joint work with Shibing Chen and Xu-Jia Wang.

Galyna Livshyts

Title: On the dimensional Brunn-Minkowski inequality

Abstract: In the recent years, a number of conjectures have appeared, concerning the improvement of the inequalities of Brunn-Minkowski type under the additional assumptions of symmetry; this includes the B-conjecture, the Gardner-Zvavitch conjecture of 2008, the Log-Brunn-Minkowski conjecture of 2012, and some variants. The conjecture of Gardner and Zvavitch, also known as dimensional Brunn-Minkowski conjecture, states that even log-concave measures in \mathbb{R}^n are in fact $\frac{1}{n}$ -concave with respect to the addition of symmetric convex sets. In this talk we shall establish the validity of the Gardner-Zvavitch conjecture asymptotically, and prove that the standard Gaussian measure enjoys $\frac{0.37}{n}$ concavity with respect to centered convex sets. Some improvements to the case of general log-concave measures shall be discussed as well. This is a joint work with A. Kolesnikov.

Jian Lu,

Title: Existence of solutions to the prescribed centroaffine curvature problem

Abstract: The centroaffine curvature is an elementary quantity in the affine differential geometry and in the theory of convex bodies. It plays a fundamental role in the study of many geometric problems. We will study the prescribed centroaffine curvature problem in the Euclidean space. This problem is equivalent to solving a Monge-Ampere equation on the unit sphere. It corresponds to the critical case of the Blaschke-Santaló inequality. By approximation from the subcritical case, and using an obstruction condition and a blow-up analysis, we obtain sufficient conditions for the a priori estimates, and the existence of solutions up to a Lagrange multiplier. This is a joint work with Huaiyu Jian and Xu-Jia Wang.

Songjun Lv

Title: L_p John ellipsoids associated with spherical measures

Abstract: There are two parts of this talk. Firstly, we shall present a new characterization for the L_p John ellipsoid found by Lutwak, Yang, and Zhang. Secondly, I study the L_p John ellipsoids associated with general Borel measures on the unit sphere. Its characterization, associated John type inclusion, as well as Ball's volume ratio inequalities will be disclosed.

Olaf Mordhorst

Title: Duality of Floating and Illumination Bodies (joint work with E. Werner)

Abstract: In this talk we present a duality relation between floating and illumination bodies. The convex floating body was introduced independently by B\{a}r\{a}ny/Larman and Sch\{u}tt/Werner for the study of random polytopes and for the extension of affine surface area to the class of all convex bodies. Later, E. Werner introduced the illumination body which has similar properties as the floating body. The definition of these two notions suggests that the polar of a floating body should not be too far away from the illumination body of the polar of a convex body although equality cannot be achieved in general. We consider this question for the class of centrally symmetric convex bodies and we provide asymptotically sharp estimates for the distance of the polar of the floating body to

Ning Zhang

Title: A solution to the problem of bodies with congruent sections or projections

Abstract: In this talk, we will construct two convex bodies K and L , such that their projections $K|H$, $L|H$ onto every subspace H are congruent, but nevertheless, K and L do not coincide up to a translation or a reflection in the origin. This gives a negative answer to an old conjecture posed by Nakajima and Suss.

Bentuo Zheng,

Title: Banach Spaces with the Ball Covering Property

Abstract: A Banach space is said to have the Ball Covering Property (BCP) if the unit sphere can be covered by countably many open balls which do not contain the origin. Banach spaces with and without the BCP will be illustrated, sufficient conditions for Banach spaces having the BCP will be discussed and related open problems will be presented.

Baocheng Zhu

Title: The Orlicz-Petty bodies

Abstract: In this talk, we will discuss the homogeneous Orlicz geominimal surface areas and their basic properties. We also talk about the existence of Orlicz-Petty bodies and the uniform boundedness of the Orlicz-Petty bodies of a convergent sequence of convex bodies, which can be used to prove that the homogeneous geominimal surface areas are continuous. Similar results for the nonhomogeneous Orlicz geominimal surface areas will be presented as well.

Du Zou,

Title: Convex Bodies with Identical John and LYZ Ellipsoids

Abstract: Convex bodies with identical John and LYZ ellipsoids are characterized. This solves a problem from convex geometry posed by G. Zhang