



**2022 Tsinghua-BIMSA Mathematics Seminar at TSIMF**

**2022 清华-BIMSA 数学研讨会**

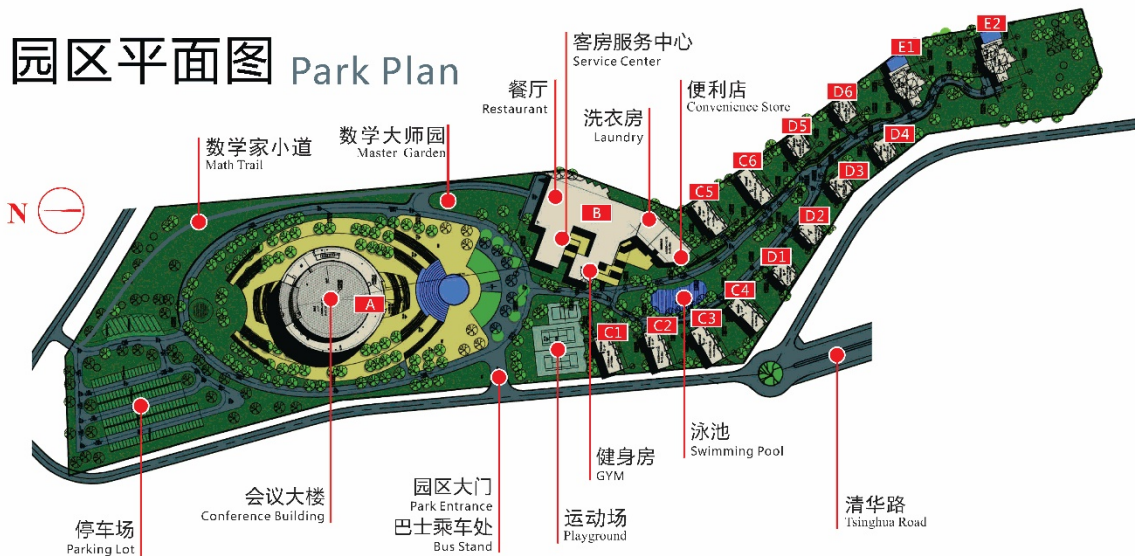
**January 17 to 24, 2022**

**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, workout gym and sport courts and other recreational facilities.

Yau Mathematical Sciences Center (YMSC) 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 related fields, 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.

## Guest Room



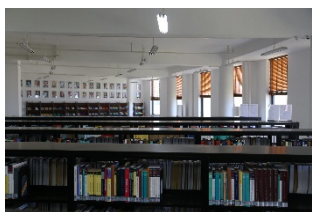
All the rooms are equipped with: free Wi-Fi (no password), TV, air conditioning and other utilities.

Family rooms are also equipped with kitchen and refrigerator.



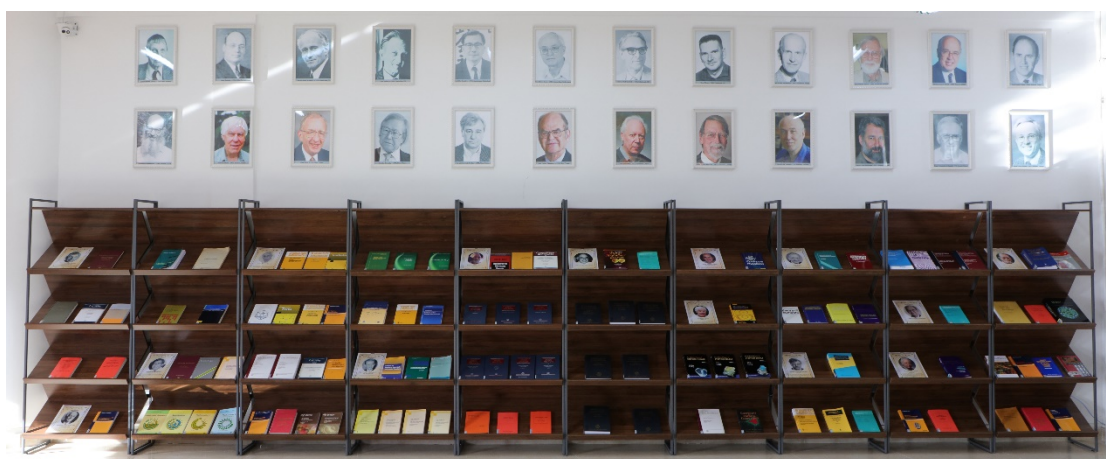


## Library



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

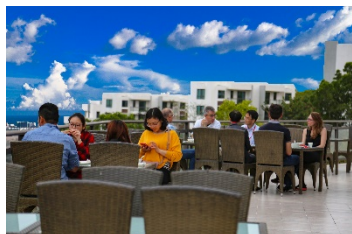
TSIMF library is available during the conference and can be accessed by using your room card. There is no need to sign out books but we ask that you kindly return any borrowed books to the book cart in library before your departure.



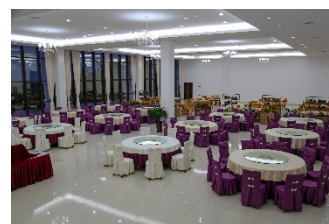
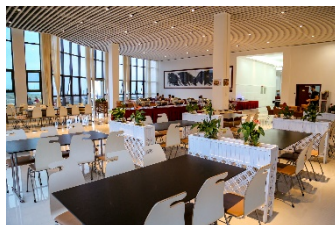
In order to give readers a better understanding of the contributions made by the Fields Medalists, the library of Tsinghua Sanya International Mathematics Forum (TSIMF) instituted the Special Collection of Fields Medalists as permanent collection of the library to serve the mathematical researchers and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

So far, there are 280 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**      07:30-08:50  
**Lunch**            12:00-13:30  
**Dinner**            18:00-19:30



## 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 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) at (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 Staff

**Location of Conference Affairs Office: Room 104, Building A**

Tel: 0086-898-38263896

Please feel free to contact us if you have any requirements:

如有特殊情况请及时联系:

**Beijing 北京 (YMSC) :**

Yuezhao Zhang 张玥钊: 15811080773; sanya@mail.tsinghua.edu.cn

**Sanya 三亚 (TSIMF) :**

Airport pick-up and nucleic acid testing matters 会务及核酸检测事宜

Miss. Xianying Wu 吴显英: 18608938696

**Arrangement of rooms and meals 食宿安排**

Miss Li Ye 叶莉: 13976798300

**Network and website 网络、设备及网页浏览-**

Mr. Shouxi He 何守喜: 18689802225

## Schedule 日程安排

Date 日期	Time 时间	Arrangement 整体安排	Schedule 详细安排	
			Time 时间	Speaker 报告人
DAY1: 2022.1.17 (Monday 周一)	Arrival and registration; Dinner 抵达及办理入住等, 晚餐			
DAY2: 2022.1.18 (Tuesday 周 二)	9: 00-12: 00	Talks of invited speakers 学术会议	9:00-10:00	TALK 1 Nanjun Yang 杨南 君
			10:00-10:30 Tea Time 茶歇	
			10: 30-11: 30	TALK 2 Jie Wu 吴杰
			17: 30-18: 00	Group Photo 合影
	12:00-15:00	Lunch and Break 午餐及午休		
	15:00-18: 00	Free Discussion 自由讨论		
18:00	Dinner 欢迎晚餐			
DAY3: 2022.1.19 (Wednesday 周三)	9: 00-12: 00	Talks of invited speakers 学术会议	9:00-10:00	TALK 3 Nicolai Reshetikhin
			10:00-10:30 Tea Time 茶歇	
			10: 30-11: 30	TALK 4 Peng Shan 单芄
	12:00-15:00	Lunch and Break 午餐及午休		
	15:00-17: 00	Free Discussion 自由讨论		
	18:00	Dinner 晚餐		
DAY 4: 2022.1.20 (Thursday 周 四)	9: 00-12: 00	Free Discussion 自由讨论		
	12:00-15:00	Lunch and Break 午餐及午休		
	15:00-17: 00	Free Discussion 自由讨论		
	18:00	Dinner 晚餐		

**Conference Brochure**

DAY 5: 2022.1.21 (Friday 周五)	9: 00-12:00	Free Discussion 自由讨论
	12:00-15:00	Lunch and Break 午餐及午休
	15:00-17:00	Free Discussion 自由讨论
	18:00	Dinner 晚餐
DAY 6: 2022.1.22 (Saturday 周六)	9: 00-12:00	Free Discussion/Departure 自由讨论/退房
	12:00-15:00	Lunch and Break 午餐及午休
	15:00-17:00	Free Discussion/Departure 自由讨论/退房
	18:00	Dinner 晚餐
DAY 7: 2022.1.23 (Sunday 周日)	9: 00-12:00	Free Discussion/Departure 自由讨论/退房
	12:00-15:00	Lunch and Break 午餐及午休
	15:00-17:00	Free Discussion/Departure 自由讨论/退房
	18:00	Dinner 晚餐
DAY 8: 2022.1.24 (Monday 周一)	Departure 退房, 离会	



## Abstract 报告摘要汇总

### DAY2: 2022.1.18 Tuesday 周二

#### 9:00-10:00 TALK 1

**BIMSA:** Assistant Researcher-Nanjun Yang 杨南君 [ynj.t.g@126.com](mailto:ynj.t.g@126.com)

**Title:** Split Milnor-Witt Motives

**Abstract:**

The Chow-Witt group is a kind of cohomology theory of smooth varieties which combines Chow groups and quadratic information of fields together. It admits realizations towards singular cohomology of both real and complex points, with significant applications in classifying vector bundles and Hermitian K-theory, as well as a refined version of enumerative geometry.

Recently, B. Calmès, F. Déglise and J. Fasel defined a kind of motivic theory representing the Chow-Witt groups, namely the Milnor-Witt (abbr. MW) motives. It's rationally equivalent to the motivic stable homotopy category defined by F. Morel. In this talk, we introduce the notion of split MW-motives. Varieties whose MW-motives split have free complex cohomology and only 2-torsions in real cohomology. We compute the MW-motive of Grassmannians bundles and complete flags bundles, which turn out to fit the split pattern we desired. Moreover, some interesting observations of Bockstein cohomology will be presented.

#### 10: 30-11: 30 TALK 2

**BIMSA:** Prof. Jie Wu 吴杰 [wujie@bimsa.cn](mailto:wujie@bimsa.cn)

**Title:** Interdisciplinary Questions in Algebraic Topology and Application

**Abstract:**

This talk will consist of two parts. In Part I, we will discuss applications of algebraic topology in data science, including a brief introduction to the classical topological data analysis (TDA), current development, our approaches in TDA and our incoming/future research on the topic. In Part II, we will discuss pure mathematical research in homotopy theory. We will concentrate on the discussions the connections between homotopy theory and the modular representation theory. After a brief introduction to the connections, we will discuss our recent progress on the topic.

### DAY3: 2022.1.19 Wednesday 周三

#### 9:00-10:00 TALK 3

**YMSC:** Prof. Nicolai Reshetikhin [reshetikhinn@yahoo.com](mailto:reshetikhinn@yahoo.com)

**Title:** Statistics of irreducible components in large tensor products of representations of simple Lie algebras.

**Abstract:**

The character measure on tensor product of finite dimensional representations of simple Lie algebras is considered. This measure is a deformation of the Plancherel measure on corresponding representations. For  $sl_2$  the character measure has a simple physical meaning. It is the Boltzman measure for  $N$  atoms in the presence of strong magnetic field and large temperature. The limiting distribution when the number of factors goes to infinity is computed. This talk can be regarded as introduction to asymptotic representation theory. Based on joint work with O. Postnova and V. Serganova.

**10: 30-11: 30 TALK 4**

**YMSC:** Prof. Peng Shan 单芑 [pengshan@tsinghua.edu.cn](mailto:pengshan@tsinghua.edu.cn)

**Title:** On the center of small quantum groups

**Abstract:**

We will explain a geometrical realisation of the center of small quantum groups in terms of cohomology of some affine Spaltenstein varieties. As application, this gives some evidence for a conjecture of Lachowska and Qi on the dimension of the center of small quantum groups. This is based on a joint work with R. Bezrukavnikov, P. Boixeda Alvarez and E. Vasserot.