Research-in-team: Black Holes, Quantum Chaos, and Solvable Quantum Systems

黑洞、量子力学与可解量子系统小组研讨会

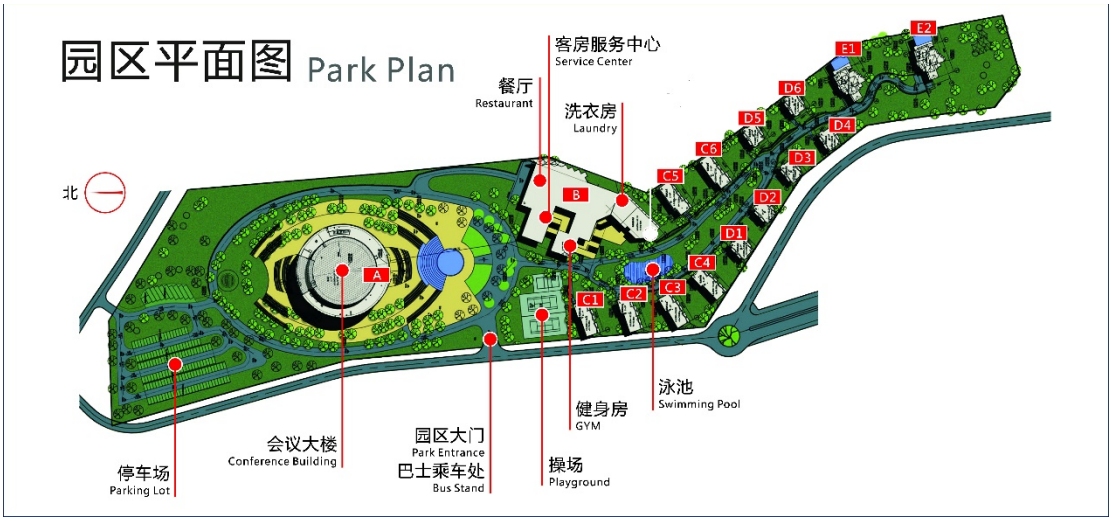
January 29 - February 2, 2018

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.

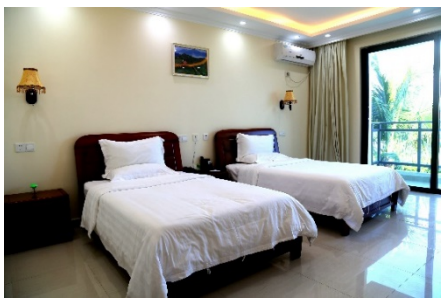
About Facilities



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

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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
Tel: 0086-186-8980-2225
E-mail: hesx@ tsimf.cn

Administrator: Ms. Xianying, Wu 吴显英
Tel:0086-186-8962-3393
E-mail: wuxy@tsimf.cn

Location of Accommodation Affair Office: Room 200, Building B1
Tel：0086-898-38882828
Accommodation Manager: Ms. Li Ye 叶莉
Tel: 0086-139-7679-8300
E-mail: yeli@tsimf.cn

Director of TSIMF:
Prof.Xuan Gao 高瑄
Tel：0086-186-0893-0631
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Time	Monday (Jan 29)	Tuesday (Jan 30)	Wednesday (Jan 31)	Thursday (Feb 1)	Friday (Feb 2)
09:00–10:00					
10:00–10:30	Tea Break	Tea Break	Tea Break	Tea Break	
10:30–11:30	Organization	Ling	Castro	Anninos	
	Lunch	Lunch	Lunch	Lunch	Lunch
14:00–15:00	Monica	Verlinde	Discussion	Hofman	
15:00–15:30	Tea Break	Tea Break		Tea Break	Break
15:30–16:30	Disscussion on Scrambling	Disscussion		Disscussion	
16:30–17:00	Break	Break		Break	Break
17:00–18:00					
	Dinner	Dinner	Banquet	Dinner	Dinner

Black Holes, Quantum Chaos, and Solvable Quantum Systems Workshop

January 29-Feb 2, 2018

(1) Herman Verlinde, Princeton

Title: Black Hole Horizons, Chaos and Quantum Error Correction

Abstract:

(2) Ling Yi, IHEP CAS

Title: Holographic Butterfly Effect and Phase Transition

Abstract: When the Lyapunov exponent in a quantum chaotic system saturates the bound, it is proposed that this system has a holographic dual described by a gravity theory. In particular, the butterfly effect as a prominent phenomenon of chaos can ubiquitously exist in a black hole system characterized by a shockwave solution near the horizon. We firstly propose that the butterfly velocity can be used to diagnose phase transition in holographic theories. We provide evidences for this proposal with two sorts of holographic models. Then we investigate the universal behavior of holographic butterfly effect near the quantum critical region and low temperature region with different phases. We argue that their criticality is controlled by the holographic scaling geometry with deformations induced by a relevant operator at finite temperature.

(3) Alejandra Castro, Amsterdam University

Title: Wilson Lines and Ishibashi states in AdS_3/CFT_2

Abstract: In this talk I will discuss a refined interpretation of a gravitational Wilson line in AdS_3 in terms of Ishibashi states in the dual CFT_2. Our strategy is to give a method to evaluate the Wilson line that accounts for all the information contained in the representation, and clarify the role of boundary conditions at the endpoints of the line operator. This gives a novel way to explore and reconstruct the local bulk dynamics.

(4) Diego Hofman, Amsterdam University

Title:

Abstract:

(5) Dionysios Anninos, IAS, Princeton

Title:

Abstract:

(6) Monica Guica, Saclay

Title: An integrable Lorentz-breaking deformation of two-dimensional CFTs

Abstract: It has been recently shown that the deformation of an arbitrary two-dimensional conformal field theory by the composite irrelevant operator $T\bar{T}$, built from the components of the stress tensor, is solvable; in particular, the finite-size spectrum of the deformed theory can be obtained from that of the original CFT through a universal formula. We study a similarly universal, Lorentz-breaking deformation of two-dimensional CFTs that posess a conserved U(1) current, J. The deformation takes the schematic form $J\bar{T}$ and is interesting because it preserves an $SL(2,R) \times U(1)$ subgroup of the original global conformal symmetries. For the case of a purely (anti)chiral current, we find the finite-size spectrum of the deformed theory and study its thermodynamic properties. We test our predictions in a simple example involving deformed free fermions.