Joint Meeting of HKU and SUSTech on Several Complex Variable and Complex Geometry

Conference Handbook

Dates: December 13 to 15, 2024

Venue: SUSTech International Center for Mathematics

Host: SUSTech International Center for Mathematics

Intoduction

The Joint Meeting of HKU and SUSTech on Several Complex Variable and Complex Geometry is a 3-day workshop that will take place at the Southern University of Science and Technology (SUSTech) in Shenzhen, China, from December 13 to 15, 2024. Registration and reception of participants will be held on December 13.

The organizers gratefully acknowledge the support by SUSTech International Center for Mathematics.

Organizing Committee

Vycheslav Futorny (SUSTech)

Ilya Kossovskiy (SUSTech)

Tuen Wai Ng (HKU)

Participants

(Arranged Alphabetically)

Ruichun CHEN (HKU)

Kenneth CHIU(HKU)

Cong DING (Shenzhen University)

Vycheslav Futorny (SUSTech)

Zheng HUA(HKU)

Iryna Kashuba (SUSTech)

Ilya Kossovskiy (SUSTech)

Aleksey Kostenko (University of Ljubljana)

Zhan LI (SUSTech)

Ngaming Mok (HKU)

Tuen Wai Ng (HKU)

Pedro Salomao (SUSTech)

David Sykes (Center of Complex Geometry, Daejeon)

Yuefei WANG (Shenzhen University)

Sai-Kee YEUNG (Purdue University)

Efim Zelmanov (SUSTech)

Speakers

Kenneth CHIU(HKU)

Cong DING(Shenzhen University)

Zheng HUA(HKU)

Ilya Kossovskiy (SUSTech)

Zhan Li (SUSTech)

David Sykes (Center of Complex Geometry, Daejeon)

Yuefei Wang (Shenzhen University)

Sai-Kee YEUNG(Purdue University)

Schedule

18:00   Conference Registration

18:30   Dinner

09:00 - 10:00 Yuefei Wang (Shenzhen University), TBA

10:00 - 10:30 Coffee Break

10:30 - 11:30 Zheng HUA(HKU)

11:30 - 12:30 Li Zhan (SUSTech)

12:30 - 14:30 Lunch

14:30 - 15:30 Cong DING(Shenzhen University)

15:30 - 16:00 Coffee Break

16:00 - 17:00 Ilya Kossovskiy (SUSTech)

18:00   Dinner

09:00 - 10:00 Sai-Kee YEUNG(Purdue University), TBA

10:00 - 10:30 Coffee Break

10:30 - 11:30 David Sykes (Center of Complex Geometry, Daejeon)

11:30 - 12:30 Kenneth CHIU(HKU)

12:30 - 14:30 Lunch

Maps & Directions

HONG KONG INTERNATIONAL AIRPORT TO SUSTECH

Here is the homepage of Hongkong airport.

There are several ways of getting to Shenzhen from Hong Kong airport . Several ground transportation options are available 24 hours a day.

1. Arrange vehicle by us:

Hong Kong is close to Shenzhen (1-hour shuttle) and we will arrange pickups from Hong Kong International Airport to the SUSTech campus/Hotel. We will also make arrangements for you to return to the airport after the workshop. Generally, there is no need for a separate visa for Hong Kong, but we suggest checking the visa conditions for your nationality.

2. Arrive to Shenzhen by yourself:

If you arrive before 8:00 PM, it might be more convenient to take a **ferry boat** to Shenzhen Shekou. This way, there is no need to pass through Hong Kong immigration and your checked luggage can be transfered to the ferry boat for free (Remember go to E2 courter luggage hanging to shenzhen!). Then you can easily get to SUSTech/Hotel from Shekou port by taxi (about 40 minutes ride for about 70 RMB).

Note: Please, make sure that you get about 100 RMB cash as taxi drivers in Shenzhen do not accept credit cards. If you need reimbursement, please ask the driver for an invoice and keep it.

In general, foreign credit cards are not widely accepted in Shenzhen, but there are many ATMs with VISA/Mastercard logo, where one can withdraw cash with foreign debit/credit cards.

Maps & Directions

SHENZHEN AIRPORT TO SUSTECH

1. Arrange vehicle by us:

We will arrange pickups from Shenzhen Bao'an International Airport to the SUSTech campus/Hotel. We will also make arrangements for you to return to the airport after the workshop.

2. Arrive to the Hotel by yourself:

From the Shenzhen Bao'an International Airport, you can take the Shenzhen **Metro** or a **Taxi** to get to SUSTech. No matter which way you choose, you can first get to the Ground Transportation Center (GTC) of the airport. There are sign posts in the GTC and you can easily find the metro or the taxi.

If you choose **Taxi**, when you get off the taxi, remember to ask for the invoice and check if you leave something in the taxi. The normal fees are 75-100 CNY.

● **TAXI SERVICE**

Each taxi driver should have GPS on their phone and normally uses it. Make sure the meter is on, and ask for a receipt when you get off so that in case you forgot your belongings it'd be quick to get them back.
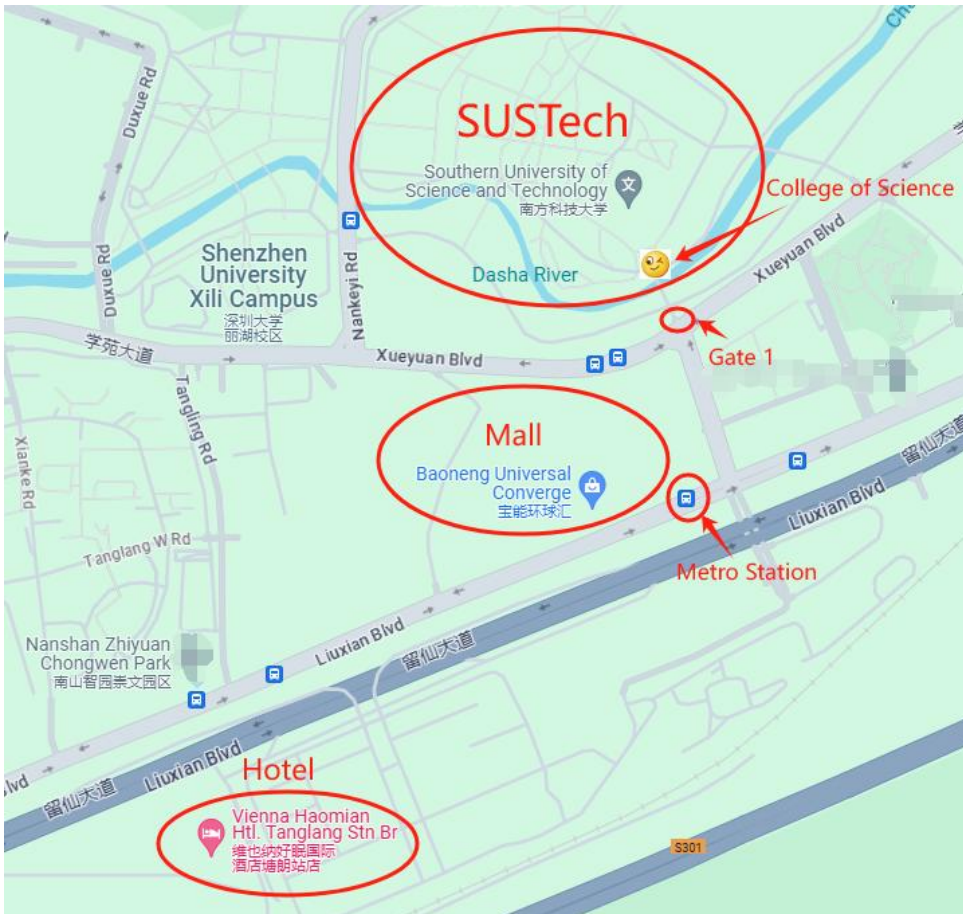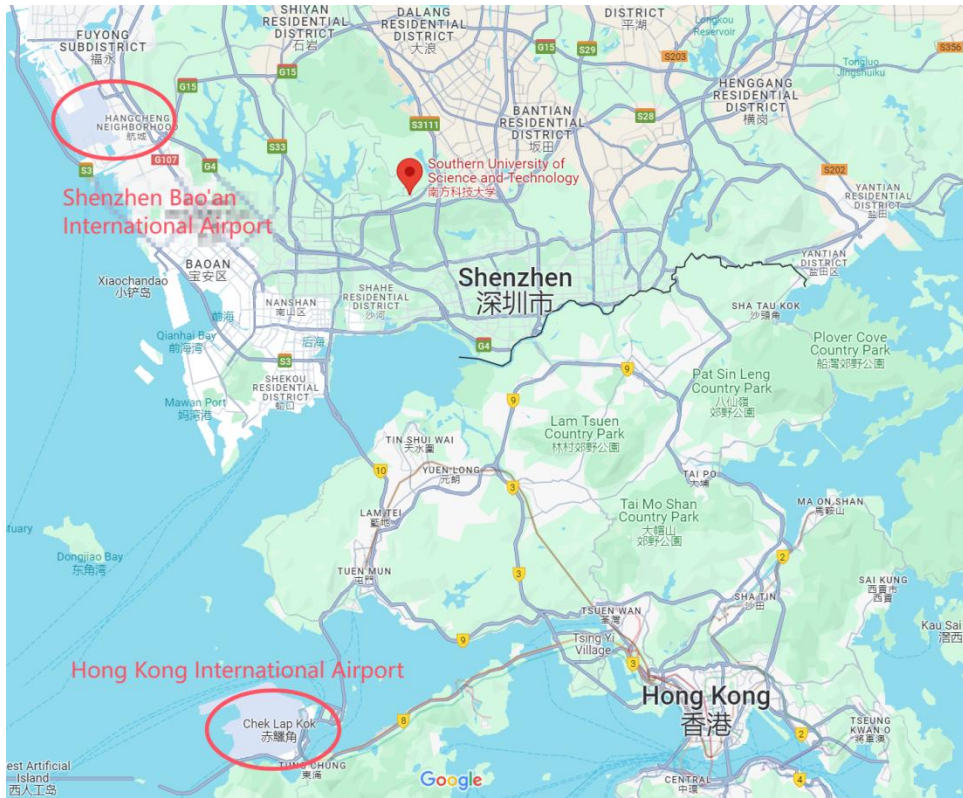
● **SHENZHEN METRO**

SUSTech Gate 1 is close to Tanglang (塘朗) on the purple Line 5.

The most convenient route to downtown Nanshan or Futian is to go up along Line 5 to Shenzhen North Station (深圳北站) (in the direction of Huangbeiling (黄贝岭)) and then transfer to the red Line 4 heading south toward Futian Checkpoint (福田口岸).

For change to buy tickets, go to the helping desk at each station.

Maps & Directions

Maps & Directions

In **guide made by SUSTech students**. You can view real-time campus bus routes and arrival times here, as well as the number of people currently queuing at the school's cafeterias. Additionally, it includes information on dining, local transportation, accommodation, and various other aspects of life at SUSTech.

1. Please note, this website may require a VPN or a local network connection in China.

2. Foreigners could use the **Google translation tool** in Chrome to translate the manual.
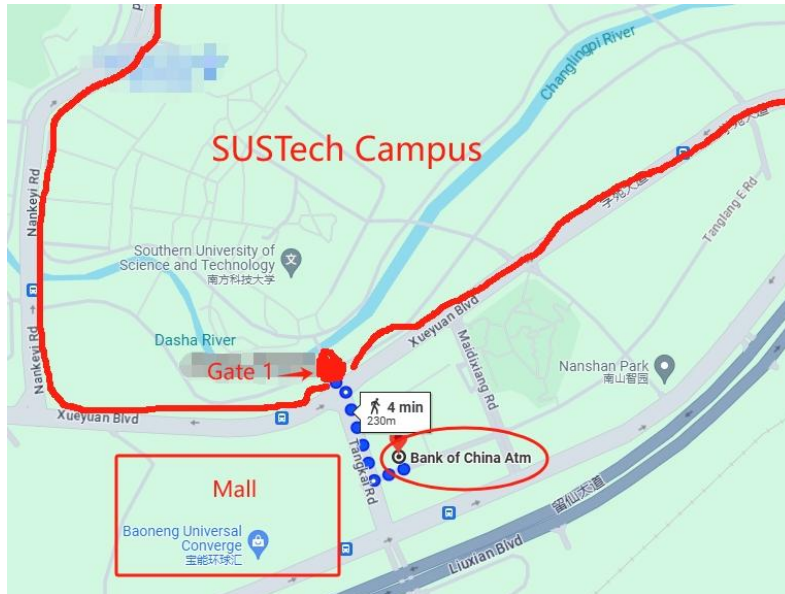
Pratical Advice

1. Payment Advice:

We recommend using cash in Shenzhen. Cash can be easily obtained from several ATMs nearby and on campus.
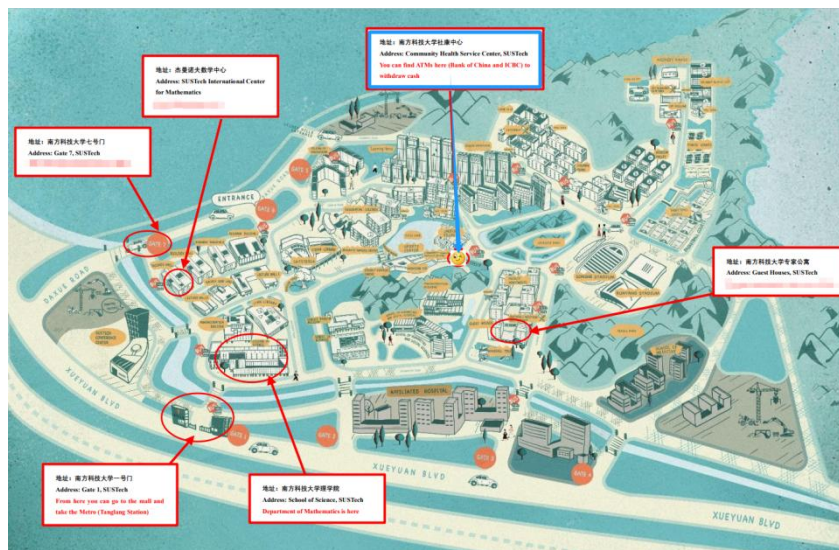
1) Off-campus, the **Bank of China ATM** is just a 4-minute walk from Gate 1, making it a recommended option.

Address: 6A, Hua Hui Yun Men, Nanshan district 广东省深圳市 南山区 华晖云门 6 6A 商铺

2) On-campus, there are Industrial and Commercial Bank of China (ICBC), Bank of China (BOC) and China Citic Bank ATMs. You can take the L1 shuttle near Gate 1 to the Community Health Service Center, which takes about 10 minutes, or walk for 20 minutes.

Address：Community Health Service Center 社康中心

3) Near the hotel, there is a **China Merchants Bank ATM** just 300 meters away, a 5-minute walk.

2. Communication

1) WeChat

We recommend installing the WeChat app in advance. If you need any assistance, please contact Yingzhi or Ilja.

2) VPN

Certain services such as Google, Facebook, WhatsApp, and Instagram etc. are not available in China. If it is important for you to continue using these services while in China, please install a VPN app on your phone or computer. For example, we recommend "**Astrill**" VPN.

3. E-pay Services in China

1) Bank card

Bank cards issued in your home country/region can be accepted if logos of UnionPay, Visa, Mastercard and other payment organizations are displayed at the checkout counter (see picture). If not, please ask the cashier whether your bank card can be accepted. If you hold a UnionPay card, it can be accepted by all merchant POS terminals in China's mainland.

2) WeChat Pay

a. Search for WeChat in the app store, and download it.

b. Open the WeChat app, and register with your phone number or just sign in if you have already registered.

c. Add bank cards as shown.

Note: Visa, Mastercard, American Express, JCB, Diners Club, and Discover cards can all be added to WeChat Pay.

d. Pay by scanning QR code. You can pay by scanning a merchant's QR code or by having a merchants can yours.

4. Electrical adaptors and voltage

In China, the voltage is 220V at 50Hz. If your device charger uses a 2-pin plug, you should have no issues plugging it in without a transformer. However, for devices with a 3-pin plug, it's recommended to bring a travel adapter. For more information on Chinese sockets, please refer here for the Chinese sockets.

5. Maps

Google Maps: Requires a VPN to function within China.

Apple Maps: Available for iPhone users, comes with an English version, and works without a VPN.

Android users : Can try maps.me, which offers offline maps.

6. Umbrella

The weather in Shenzhen can be unpredictable, with sudden changes between sunny and rainy. It's advisable to bring an umbrella just in case.

ON THE TOPOLOGICAL PROPERTIES OF HOLOMORPHIC COLLATZ MAPS

Yuefei WANG (Shenzhen University)

Abstract: We will talk about our recent results on the simple connectivity of the Fatou components and the uniform perfectness of the Julia sets of general ized holomorphic Collatz maps. This is joint work with Chunlei Cao and Huayu Zhao.

SYMPLECTIC FOLIATION OF GRASSMANNIAN

Zheng HUA (HKU)

Abstract: The standard Poisson structure on complex grassmannian is defined by the Drinfeld-Jimbo trignometric r-matrix. By realizing it as a poisson moduli space of coherent system on Kodaira cycles, we classify all symplectic leaves of the standard Poisson structure. The torus orbits of the symplectic leaves are exactly the positroid varieties. As a byproduct, we obtain new Poisson structures parametrized by a Calabi-Yau curve and a simple vector bundle on it, which "deforms" the standard poisson structure.

This is a joint work with Sasha Polishchuk.

AUTOMORPHISM GROUPS AND HOMOGENEOUS FIBRATIONS ON ALGEBRAIC VARIETIES

Zhan LI (SUSTech)

Abstract: Algebraic varieties with nef anticanonical bundles exhibit homogeneous structures for their Albanese morphisms and maximal rationally chain-connected (MRC) fibrations. In this talk, we examine the relationship between automorphism groups and these homogeneous structures. Besides, a classical theorem by Nishi and Matsumura establishes a natural group homomorphism associated with the Albanese morphism, which induces the Chevalley decomposition of the automorphism group up to an isogeny. We extend this perspective by proving an analogous result for the MRC fibrations. This is joint work with Jinsong Xu.

ON EQUIVARIANT COMPACTIFICATION OF SOME UNIPOTENT ALGEBRAIC GROUPS

Cong DING (Shenzhen University)

Abstract: Unlike the reductive group compactifications (e.g. toric varieties), equivariant compactification of unipotent algebraic groups is less known. In this talk, I will report some problems and recent progress around this topic, especially for vector groups and Heisenberg groups.

This is based on joint works in progress with Zhijun Luo (IBS, CCG).

SOME DIRECTIONS IN COMPLEX HYPERBOLICITY

Sai Kee YEUNG (Purdue University)

The goal of the talk is to explain some recent directions in complex hyperbolicity. The first one is a joint project with Kwok-kin Wong on an approach to complex hyperbolicity from the point of view of Carathéodory geometry. The second is on a joint work with Patrick Tuen-Wai Ng on a problem of Hayman, by relating the problem to renormalization, potential theory and complex dynamics.

SLOPE-DETERMINANT METHOD, COMPLEX CELLULAR STRUCTURES, AND HYPERSURFACE COVERINGS OF REGULAR RATIONAL POINTS

Kenneth Chung Tak CHIU (HKU)

Abstract: We will first mention Bost's slope method and Chen's results on the evaluation map in Arakelov geometry. Next, we will talk about complex cellular structures introduced by Binyamini and Novikov, and mention a bound for the determinant of the evaluation map when the rational points are in the same complex cell. We will then explain how this bound improves an estimation on the number of hypersurfaces required to cover the regular rational points with bounded Arakelov height on a projective variety.
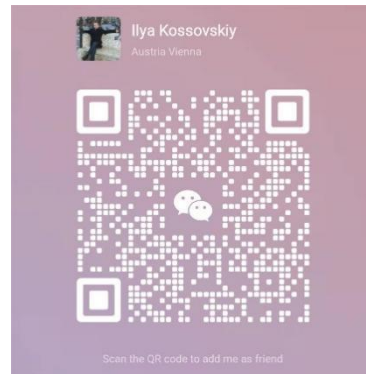
Abstracts of other talks are TBA,

We will update them soon.

Contact Us

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