



HAKONE XVI

SEP 2-7, 2018, TSINGHUA UNIVERSITY, BEIJING, CHINA

**16th International Symposium on High
Pressure Low Temperature
Plasma Chemistry**

Conference program



Organizers

TSINGHUA UNIVERSITY, BEIJING, CHINA

- **Department of Energy and Power Engineering;**

<http://www.te.tsinghua.edu.cn/publish/teen/index.html>



- **Department of Engineering Physics;**

<http://www.engineeringphysics.tsinghua.edu.cn/>



Contact

Room 201, Local Organizing Committee

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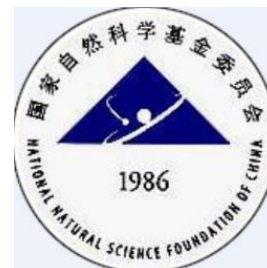
Web

<http://hakone.csp.escience.cn>



Sponsors

- **National Natural Science Foundation of China**
国家自然科学基金委



- **Department of Energy and Power Engineering**
清华大学能源与动力工程系



- **Science and Technology on Plasma Dynamics Lab**
等离子体动力学国家级重点实验室



- **Avantes**
北京爱万提斯科技有限公司



- **Beijing Hiden Analytical Ltd.**
北京英格海德分析技术有限公司



- **Nanjing Suman Plasma Technology Co.,Ltd**
南京苏曼等离子科技有限公司



- **LONGKING**
福建龙净环保股份有限公司





Location: Tsinghua University

Tsinghua University was established in 1911, originally under the name “Tsinghua Xuetang”. The school was renamed “Tsinghua School” in 1912. The university section was founded in 1925. The name “National Tsinghua University” was adopted in 1928.

The faculty greatly valued the interaction between Chinese and Western cultures, the sciences and humanities, the ancient and modern. Since China opened up to the world in 1978, Tsinghua University has developed at a breathtaking pace into a comprehensive research university. At present, the university has 14 schools and 56 departments with faculties in science, engineering, humanities, law, medicine, history, philosophy, economics, management, education and art. The University has now over 25,900 students, including 13,100 undergraduates and 12,800 graduate students. As one of China’s most renowned universities, Tsinghua has become an important institution for fostering talent and scientific research.

The educational philosophy of Tsinghua is to “train students with integrity.” Among over 120,000 students who have graduated from Tsinghua since its founding are many outstanding scholars, eminent entrepreneurs and great statesmen remembered and respected by their fellow Chinese citizens.

With the motto of “Self-Discipline and Social Commitment” and the spirit of “Actions Speak Louder than Words”, Tsinghua University is dedicated to the well-being of Chinese society and to world development.





General information

High Pressure Low Temperature Plasma Chemistry Symposium (HAKONE) is a biennial international symposium, which brings together scientists and engineers from both of academic and industrial sphere working on subjects in the basic research and plasma processing of high pressure and low temperature plasma chemistry. The symposium provides for participants the opportunity to present the progress in their work and to discuss related problems of current interest in theory, experiment and applications in various areas. Moreover, HAKONE provides a forum for sharing knowledge, experience and creative ideas in a friendly atmosphere.

The series of High Pressure Low Temperature Plasma Chemistry Symposiums was initiated in Hakone (Japan, 1987). The next meetings were held in Kazimierz Dolny (Poland, 1989), Strasbourg (France, 1991), Bratislava (Slovakia, 1993), Milovy (Czech Republic, 1996), Cork (Ireland, 1998), Greifswald (Germany, 2000), Pühajärve (Estonia, 2002), Padova (Italy, 2004), Saga (Japan, 2006), Oléron Island (France, 2008), Trenčianske Teplice (Slovakia, 2010), Kazimierz Dolny (Poland, 2012), Zinnowitz (Germany, 2014) and Brno (Czech Republic, 2016).

Topics

- Fundamental problems of high pressure discharges
- Modelling and diagnostics
- Molecular synthesis and decomposition
- Ozone generation and applications
- Generation of radiation in high pressure discharges
- Depollution and environmental applications
- Surface processing and technology (cleaning, coating, etching and modification, equipment)
- Biological applications
- Miscellaneous



Committees

● International Scientific Committee

Ronny Brandenburg (Germany)	Jerzy Mizeraczyk (Poland)
Mirko Černák (Czech Republic) -chair	Cristina Paradisi (Italy)
Tomáš Hoder (Czech Republic)	Henryka D. Stryczewska (Poland)
Nicolas Gherardi (France)	Hans-Erich Wagner (Germany)
Tony Herbert (Ireland)	Koichi Yasuoka (Japan)
Haruo Itoh (Japan)	Indrek Jõgi (Estonia)
Masuhiko Kogoma (Japan)	Matti Laan (Estonia) - honorary member
Kirill V. Kozlov (Russia)	Chobei Yamabe (Japan) - honorary member
Štefan Matejčík (Slovakia)	

● Reading and Advisory Committee

(Masaryk University, Czech Republic)

Zdeněk Bonaventura	Zdeněk Navrátil
Jan Čech	Jozef Ráhel'
Pavel Dvořák	Petr Synek
Tomáš Hoder	David Trunec
Vít Kudrle	Jan Voráč

● Local Organizing Committee

Lu Duan
Shui-Qing Li (co-chair)
Qing Liu
Hai-Yun Luo
Yi-Kang Pu (chair)
Yun Wu



Important information

1. Check in

Time: Sep 02 (Sunday) 14:00 – 22:00 Location: Lobby of Jin Chunyuan Hotel

2. Reception desk

Time: Sep 02 (Sunday) 14:00 – 22:00; Sep 03-07 (Monday-Friday) 8:00 -17:00;

Location: Lobby of Jin Chunyuan Hotel

3. Accommodation

Accommodation in Jin Chunyuan Hotel from Sep 02 evening to Sep 07 morning is included in the registration fees.

4. Oral presentation

All oral presenters are requested to copy your PPT into the computer, at least 10 minutes before the start of each session. The time for each paper in the oral session is 20 minutes, including 5 minutes for questions, answers and comments.

5. Poster presentation

Each poster should be printed in A0 portrait format, 1189 mm high × 841 mm wide (46.8” x 33.1”). Please submit it at collection point located by the registration desk during check-in. All the entries are to be mounted in the numbered space that has been reserved for it.

6. Meal

Breakfast for guests of Jin Chunyuan Hotel: 7:00-9:00

Location	Sep 02-Sun	Sep 03-Mon	Sep 04-Tus	Sep 05-Wed	Sep 06-Thu	Sep 07-Fri
Lunch	--	Jia Suo	Jia Suo	JinChunyuan	Jia Suo	JinChunyuan
Dinner	Reception	JinChunyuan	JinChunyuan	JinChunyuan	Banquet	--

Lunch: 12:00-13:30, Sep 03-07

Dinner: 18:00-19:30, Sep 03-04; 18:30-20:00, Sep 05

7. Welcome reception

18:00-19:30, Sep 02 (Sunday), Jin Chunyuan Hotel

8. Excursion

14:00-18:00, Sep 05 (Wednesday), The Summer Palace

Bus: depart from Jin Chunyuan Hotel at 14:00

9. Banquet

17:30-20:00, Sep 06 (Thursday), Quanjude Restaurant

10. Group Photo:

10:00-10:30, Sep 03 (Monday), Weather dependent

11. Committee meeting (ISC)

20:00-21:00, Sep 04 (Tuesday)

Meeting room 203, Department of Energy and Power Engineering



Scientific program

• Sep 03, Monday morning

Chair: M Černák

8:00-9:00	Registration
9:00-9:20	Opening
9:20-10:10	Ulrich Kogelschatz Lecture Award Akira Mizuno Electrostatics and Non-Thermal Plasma for Health and Environment
10:10-10:40	Coffee break / Group Photo
10:40-11:20	Aart W. Kleijn Plasma Catalytic Conversion of CO ₂ and Small Hydrocarbons
11:20-11:40	Hai-Xing Wang An Investigation of Carbon Dioxide Splitting Using Microhollow Cathode Discharge
11:40-12:00	Dušan Kováčik Atmospheric-Pressure Plasma Treatment of Float Glass as Surface Cleaning and Activation Procedure Prior to Coating
12:00-13:30	Lunch, Jia Suo

• Sep 03, Monday afternoon

Chair: A Mizuno

14:00-14:50	Invited lecture Anne Bourdon Barrier Discharge and Pulsed Discharge Modelling
14:50-15:10	Fumiyoshi Tochikubo Simulation of Atmospheric-Pressure Glow Discharge Electrolysis for Silver Nanoparticle Synthesis in Silver Nitrate Solution
15:10-15:30	Clémence Tyl Experimental and Numerical Study of Memory Effect in Homogeneous Atmospheric Pressure Dielectric Barrier Discharges in N ₂ /O ₂ and N ₂ /NO Mixtures
15:30-16:00	Coffee break
16:00-16:20	Marc van der Schans The Memory Effect of Pulsed Plasma Jets: Temporal and Spatial Behavior of Guided Streamers in N ₂ , He and Ar
16:20-16:40	Xi Lin Study of Memory Effect in A Townsend Discharge: Quantification of Species by Laser Induced Fluorescence Spectroscopy
16:40-17:00	Yifei Zhu Modeling of Streamer-to-Spark Transition of a Nanosecond Pulsed Discharge for Kinetics Parameters
17:00-17:20	Veronika Medvecká Atmospheric Pressure Low-Temperature Plasma in Agriculture and Food Processing
18:00-19:30	Dinner, Jin Chunyuan



● **Sep 04, Tuesday morning**

Chair: A Bourdon

9:00-9:50	Invited lectures Giorgio Dilecce Laser Induced Fluorescence in Nanosecond Pulsed Discharges
9:50-10:10	Koichi Sasaki Observation of 1d-1s Forbidden Optical Emission of Atomic Oxygen in Atmospheric-Pressure N ₂ /O ₂ Plasma Jet
10:10-10:30	Jintao Sun Kinetic Contribution of Vibrational States in Plasma Assisted CH ₄ Reforming
10:30-11:00	Coffee break
11:00-11:20	Abdeldjalil Reguig Comparison of Electrical Breakdowns Produced by High Voltage Pulses Applied to Anodes Made of Copper and Highly Resistive Composite Material
11:20-11:40	Matej Klas Discharge Breakdown Studied under Extreme Conditions
11:40-12:00	Xingqian Mao Hybrid Repetitively-Pulsed Nanosecond Discharge and DC Discharge Enhanced Low Temperature H ₂ /O ₂ /He Ignition by Non-equilibrium Excitation
12:00-13:30	Lunch, Jia Suo

● **Sep 04, Tuesday afternoon**

Chair: M Simek

14:00-14:50	Invited lecture Lifang Dong Pattern Formation in Dielectric Barrier Discharge
14:50-15:10	Kirill V. Kozlov Filamentary and Diffuse Barrier Discharges in Noble Gases with Admixtures of Molecular Gases
15:10-15:30	Tetsuya Abe Production of An Ammonia Storage Material by Atmospheric Dielectric Barrier Discharge at Room Temperature
15:30-16:00	Coffee break
16:00-16:20	Nicolas Naudé Influence of barrier material on the Atmospheric Pressure Townsend Discharge
16:20-16:40	Marina V. Sokolova Influence of Barrier Properties on Dielectric Barrier Surface Discharge Driven by Microsecond Voltage Pulses
16:40-17:00	Indrek Jõgi Ozone Assisted NO _x Oxidation and Adsorption on Metal-oxides
17:00-17:20	Sina Jahanbakhsh Correlation Between Electrical and Spatio-Temporal Development in a One-Sided, Single Filament DBD in Pin-To-Hemisphere Configuration
18:00-19:30	Dinner, Jin Chunyuan
20:00-21:00	ISC Meeting Meeting room 203, Department of Thermal and Power Engineering



● **Sep 05, Wednesday morning**

Chair: L Dong

9:00-9:50	Invited lectures Felipe Iza Chemical Probes and Plasma Synthesis
9:50-10:10	Mirko Černák Micro-Hollow Surface Discharge for Bacterial Decontamination
10:10-10:30	Bartosz Michalczuk Ultrasensitive Method of Monitoring of VOC's Decomposition in Corona Discharge Based on Ion Mobility Spectrometry
10:30-11:00	Coffee break
11:00-11:20	Jozef Rahel The Use of DBD Plasma Activated Powders in Ceramic Processing
11:20-11:40	Bingxuan Lin Multi-Channel Plasma Igniter and Plasma Fuel Injector for Aero Engine
11:40-12:00	Qiang Chen The Generation of Aqueous Hydrogen Peroxide in DC Plasma-Liquid System with Liquid as Cathode
12:00-13:30	Lunch, Jin Chunyuan

● **Sep 05, Wednesday afternoon**

14:00-18:00	Excursion The Summer Palace The bus will depart from Jin Chunyuan Hotel at 14:00 pm
18:30-20:00	Dinner, Jin Chunyuan



● **Sep 06, Thursday morning**

Chair: G Dilecce

9:00-9:50	Invited lectures Milan Simek Processing of Solid and Liquid Materials by Atmospheric-Pressure Surface DBD-Based Jet
9:50-10:10	Jan Voráč Quantum States Distribution in OH(X) Radical Produced by Streamer Discharges at Liquid Water Interface
10:10-10:30	Tomáš Hoder Microampere Currents in Barrier Discharges at Water Interface in Atmospheric Pressure Air
10:30-11:00	Coffee break
11:00-11:20	Han Xu Comparison Between the Water Activation Effects by Cold Plasma Jets in Different Working Conditions
11:20-11:40	Yunqiu Cui Experimental Study in Removal of Tetracycline in Simulant Water by Dielectric Barrier Discharge Plasma
11:40-12:00	Qing Xiong Time-Behavior of Plasma-Activated Aqueous Chemistry and its Indications to Inactivation of Candida Glabrata
12:00-13:30	Lunch, Jia Suo

● **Sep 06, Thursday afternoon**

14:00-16:30	Poster session Posters will be displayed at the same conference room (Xi Jie)
17:30-20:00	Banquet Quanjudu Restaurant: Peking Roast Duck



● **Sep 07, Friday morning**

Chair: F Iza

9:00-9:20	Masuiro Kogoma The Surface Treatment of Liquid Cristal Polymer Using Atmospheric Pressure Glow Discharge.
9:20-9:40	Piotr Krupski Cooling System of RF Plasma Jet for Temperature Non-resistant Surface Treatment
9:40-10:00	Naoki Osawa Distribution of Surface Potential on Dielectric Barrier Under Different Discharge Modes in Atmospheric-Pressure Air
10:00-10:20	Coffee break
10:20-10:40	Ana Sobota Plasma-Surface Interaction: The Influence of The Surface on the Electron Properties and Electric Fields in A Plasma Jet
10:40-11:00	Yihua Ren Complex Flame Control Using Electric Field / Plasma
11:00-11:20	Cheng Zhang Formation of Runaway Electrons Preionized Pulsed Diffuse Discharge at Elevated Pressure
11:20-11:40	Haiyun Luo Primary Research on Plasma Biosafety Using Atmospheric-Pressure Plasma in Air
11:40-12:00	Closing
12:00-13:30	Lunch, Jin Chunyuan

● **Sep 07, Friday afternoon**

14:00-16:00	Lab tour
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Poster session

P-1	Chongshan Zhong	Non-Thermal Plasma Enhancement of Drying Process
P-2	Chengdong Kong	Translational Temperature Measurement of a Pin-To-Pin Discharge Disturbed by a Turbulent Jet Flow in Atmospheric Pressure Air
P-3	Simon Dap	Development of a 0d Model to Investigate the Plasma Chemistry in a Townsend Discharge in the Mixture N ₂ /O ₂ : Role of the Associative Ionization Mechanisms in the Memory Effect
P-4	Jan Voráč	Massiveoes: Pushing the Limits – Disentangling Thermal N ₂ (C-B) and Non-Thermal OH(A-X) Rotational Distribution by Combined State-By-State and Boltzmann Simulation Approach
P-5	Pawel A. Mazurek	Analysis of Electric Field Strength and Magnetic Flux From Plasma Reactor Installations
P-6	Linsheng Wei	Temperature Distribution in Ozone Generator with Parallel-Plate Configuration and Forced Air Cooling
P-7	Rasmus Talviste	Investigation of a He Micro Plasma-Jet for Distilled Water Treatment
P-8	Clémence Tyl	Diagnostics of Local Electrical Parameters in Atmospheric Pressure Dielectric Barrier Discharges
P-9	Joanna Pawlat	DBD Plasma Jet for Inactivation of Yeast Pathogens
P-10	Fumiaki Mitsugi	Observation of Reactive Oxygen Species Emitted by Plasma Jets Using Ki-Starch Method
P-11	Dai Atsuta	Ozone Generation and Gas Temperature Characteristics by Pulse Modulated Air Dielectric Barrier Discharge Device
P-12	Nicolas Naudé	Spatially-Resolved Electrical and Optical Study of Homogeneous Dielectric Barrier Discharges in Presence of Hexamethyldisiloxane and Nitrous Oxide
P-13	Tomáš Hoder	Simulation of Electron Interactions with Liquid Water and Processes Related to Sub-Nanosecond Electrical Breakdown
P-14	Ekaterina Abramovskaia	The Barrier Discharges in the Binary Gas Mixtures of Argon and Volatile Organic Compounds
P-15	Justyna Jaroszyńska-Wolińska	Biosensor Constructed by SPP Plasma Technique for Determination of Dihydroxybenzene Isomers
P-16	Szymon Malinowski	Quantum-Chemical Analysis of Laccase Bio-Coating Formation in Corona Plasma Jet
P-17	Ján Dugáček & Pavel Štáhel	Investigation of Atmospheric Pressure Surface Modified Zirconium Dioxide Nanopowder By Thermal Desorption Spectroscopy



P-18	Bartosz Michalczuk	Detection of Phthalates Using Corona Discharge Ion Mobility Spectrometry – Mass Spectrometry (CD IMS-MS)
P-19	Zhongshu Zhang	Interface reactions between water and drift positive ions
P-20	Henryka Danuta Stryczewska	Review of Developments in Application of Ozone in Agriculture
P-21	Susana Espinho	The Effect of O ₂ Admixture on The Electron Density and Electron Temperature of Argon Microwave Discharges
P-22	Shungo Zen	Effects of Reactive Species on Low-temperature Annealing for Dye-sensitized Solar Cells
P-23	Yong Tang	Flow Fluctuation Induced by Coaxial Plasma Device at Atmospheric Pressure
P-24	Wei Cui	Lean Flammability Characteristics of Plasma-actuated Swirl Flames under Pulsating Flow Disturbances
P-25	Yihua Ren	Electrohydrodynamic flame instability under manipulations of AC and DC electric fields
P-26	Yihua Ren	Phase-selective Laser-induced Breakdown Spectroscopy



Social Program

- Excursion: The Summer Palace



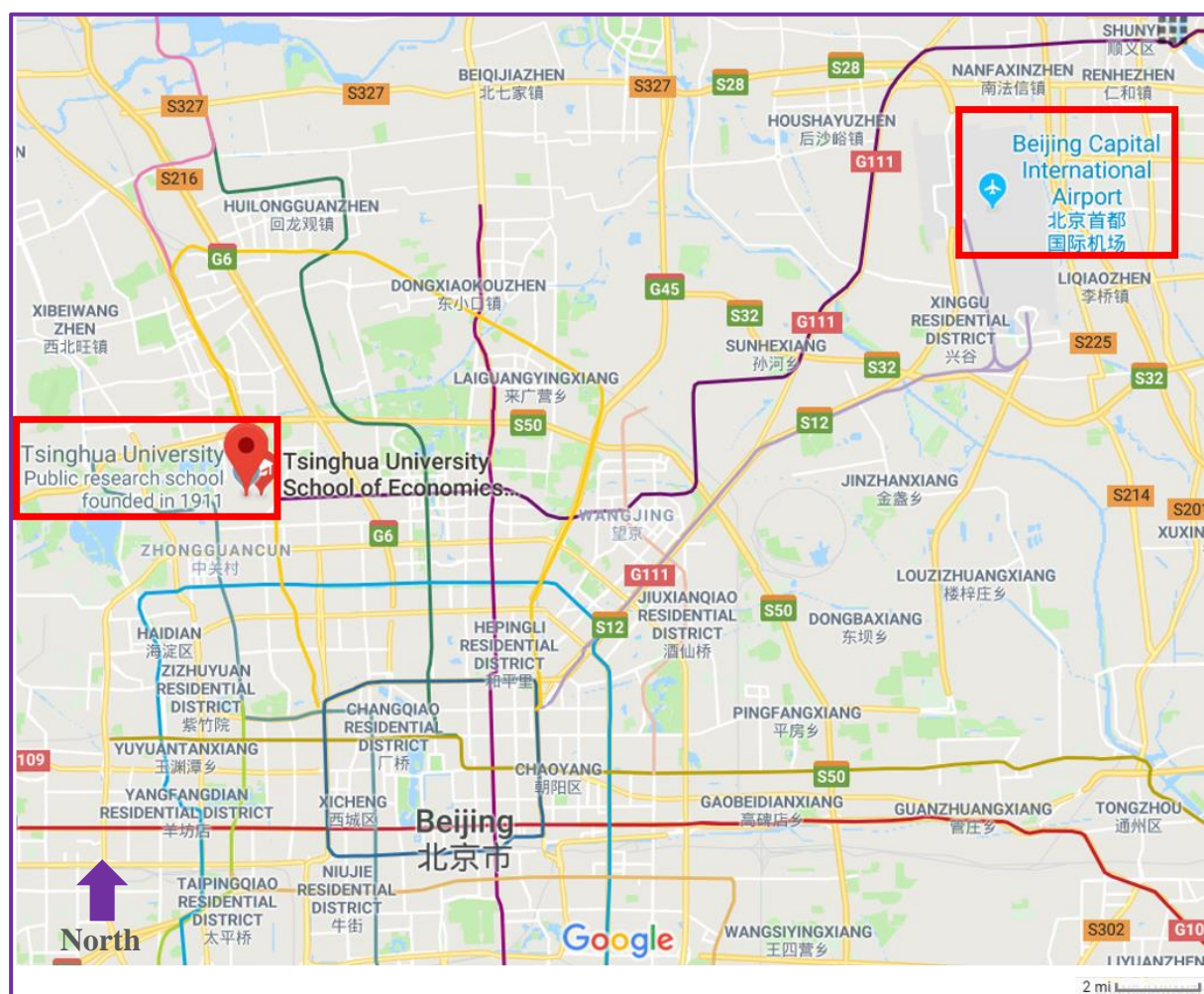
The Summer Palace (Chinese: 颐和园; pinyin: Yi He Yuan), is a vast ensemble of lakes, gardens and palaces in Beijing. It was an imperial garden in Qing Dynasty. Mainly dominated by Longevity Hill and Kunming Lake. Longevity Hill is about 60 m (200 ft) high and has many buildings positioned in sequence. The front hill is rich with splendid halls and pavilions, while the back hill, in sharp contrast, is quiet with natural beauty. The central Kunming Lake, covering 2.2 square kilometers (540 acres), was entirely man-made and the excavated soil was used to build Longevity Hill.

In December 1998, UNESCO included the Summer Palace on its World Heritage List. It declared the Summer Palace "a masterpiece of Chinese landscape garden design. The natural landscape of hills and open water is combined with artificial features such as pavilions, halls, palaces, temples and bridges to form a harmonious ensemble of outstanding aesthetic value".

Hint: we recommend that participants wear sunscreen during the excursion.



Transportation: Airport-Tsinghua



How to go to the symposium?

Beijing Capital International Airport (BCIA) – Tsinghua University: ~ 35 km away

- **Shuttle bus:** Take the shuttle bus from the airport to Tsinghua Science park
- **Subway:** Take Airport Express from Terminal 2 or Terminal 3 to SANYUANQIAO, take subway line 10 from SANYUANQIAO to HAIDIANHUANGZHUANG, and then take subway line 4 from HAIDIANHUANGZHUANG to YUANMINGYUAN. Then you can walk to the Tsinghua west gate.
- **Taxi:** It costs about 120 RMB (daytime 5:00-23:00) or 200 RMB (23:00-5:00)

Tips: You can show the information below to your taxi driver:

Please Take Me to Jin Chunyuan Hotel, Tsinghua University. Thank you!

请您送我到清华大学近春园宾馆，谢谢您！



How to leave there?

Tsinghua University – Beijing Capital International Airport (BCIA): ~ 35 km away

- **Shuttle bus:** Take the shuttle bus from Tsinghua Science park to the airport
- **Subway:** Walk to the YUANMINGYUAN station, then take subway line 4 from YUANMINGYUAN to HAIDIANHUANGZHUANG, then take subway line 10 from HAIDIANHUANGZHUANG to SANYUANQIAO, then take Airport Express from SANYUANQIAO to Terminal 2 or Terminal 3.
- **Taxi:** It costs about 120 RMB (daytime 5:00-23:00) or 200 RMB (23:00-5:00)

Tips: You can show the information below to your taxi driver:

Please Take Me to Beijing Capital International Airport **Terminal 1/2/3**. Thank you!

请您送我去首都国际机场 **T1 /T2 /T3 航站楼**, 谢谢您!

Airport Shuttle



Web: <http://en.bcia.com.cn/traffic/airbus/index.shtml>

Route: BCIA-Zhongguancun (Airport → Tsinghua)

Line 5: Wanghe Bridge [RMB 20] -- Xiaoying[RMB 20] -- Asian Games Village (Anhui Bridge) [RMB 25] -- Xueyuan Bridge[RMB 30] -- North of Baofusi Bridge [RMB 30] -- Tsinghua University Science Park (TusPark) [RMB 30]

Time: 6:50-24:00 Every 30 minutes. Buses depart when fully seated.

Route: Zhongguancun-BCIA (Tsinghua → Airport)

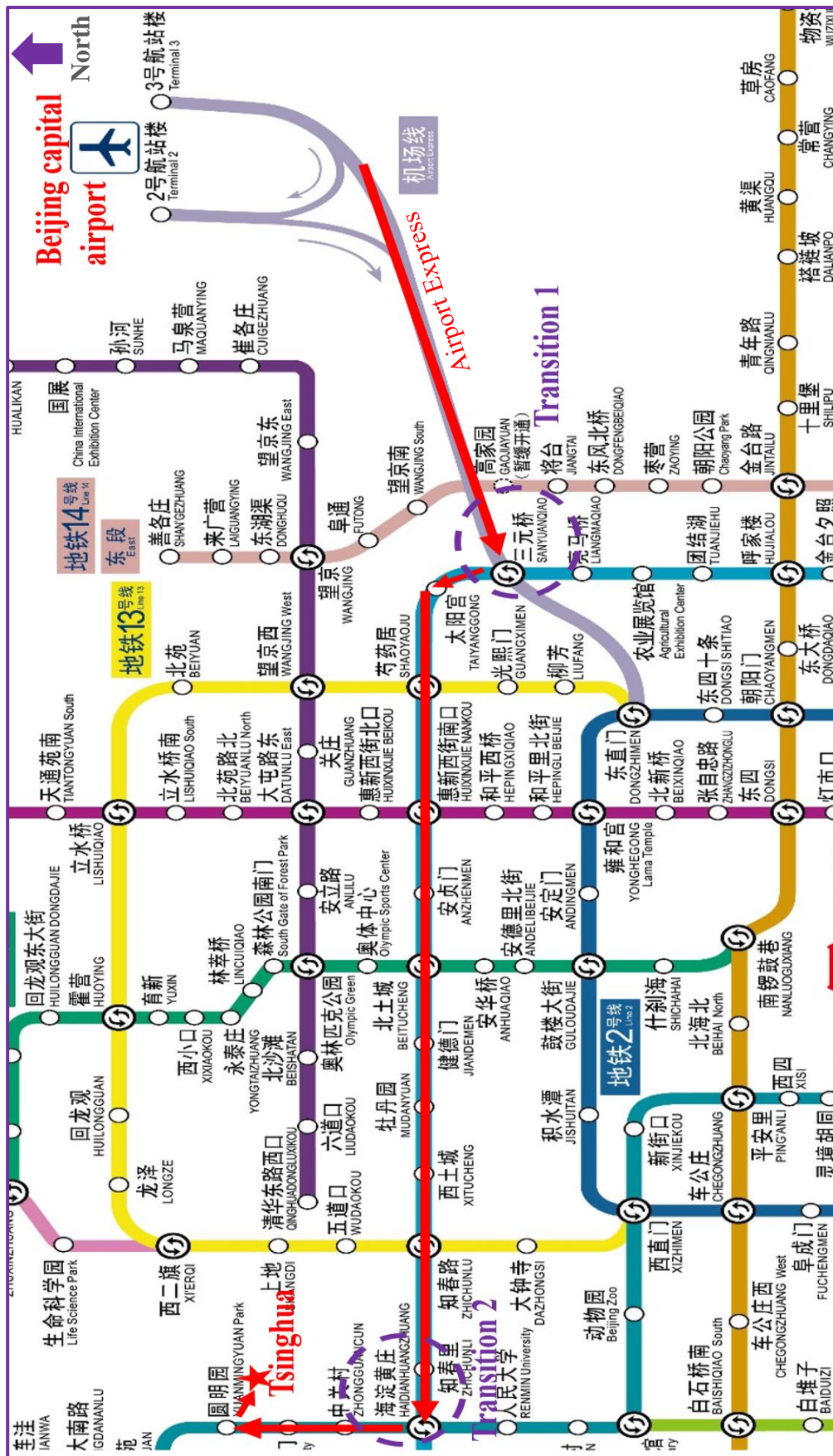
Line 5: Tsinghua University Science Park (TusPark) [RMB 30] -- Zhongguancun (Fourth Bridge) [RMB 30] -- Beihang University (north gate) [RMB 30] -- Huixin West Street (Under the Bridge of Huixin West Street, East of Anhui Plaza) [RMB 20] -- **T2 -- T1 -- T3**

Time: 5:10 ~ 22:00 Every 30 minutes. Buses depart when fully seated.

Tips: It takes around 1.5 hours. Please note, the traffic in Beijing will become heavy during morning or evening peaks.



Beijing subway map



Website: <https://www.bjsubway.com/en/>

The nearest station to Tsinghua University is YUANMINGYUAN park station (100 meters away from Tsinghua west gate)

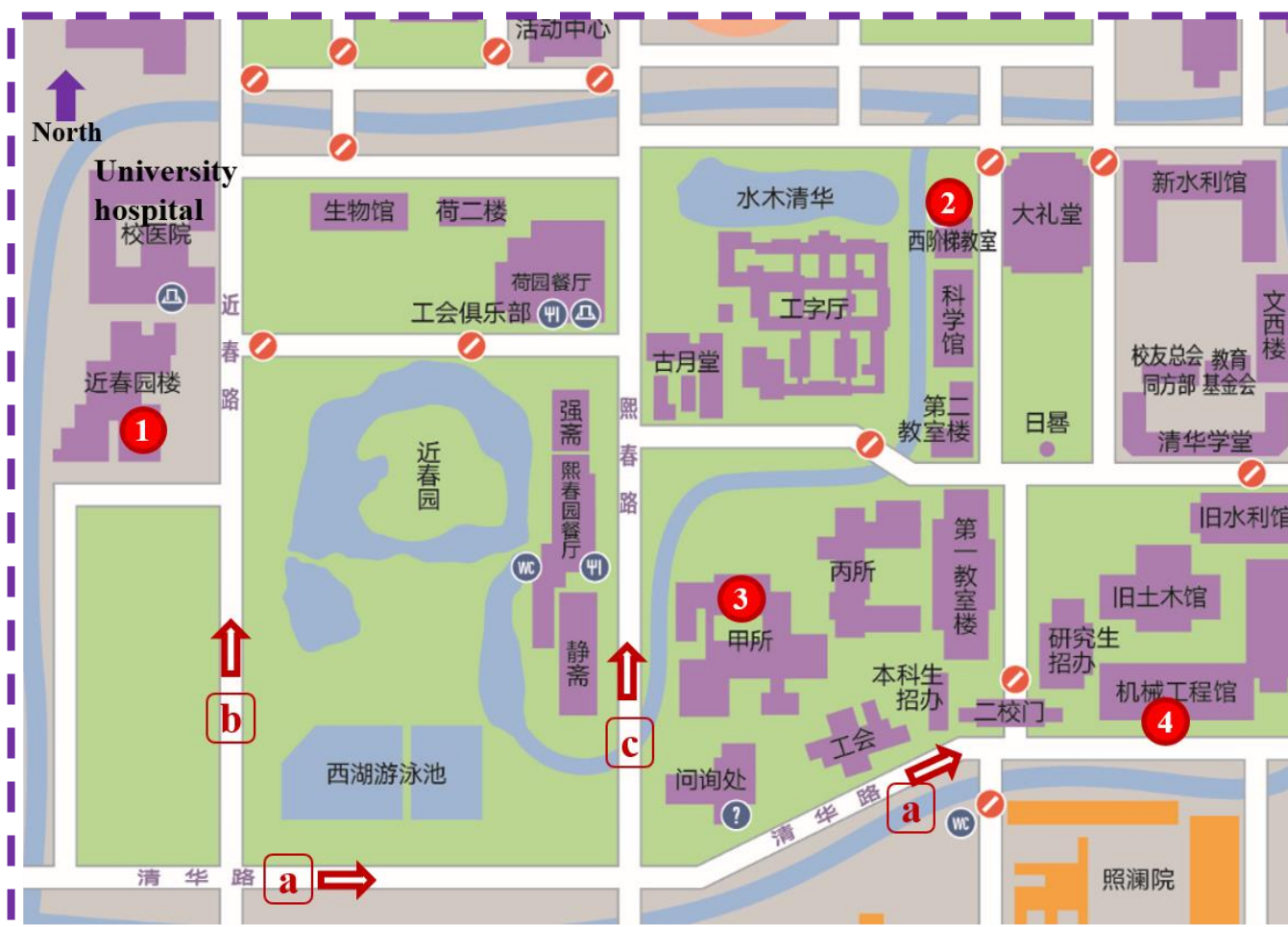


Tsinghua map





Tsinghua map (zoom in)



1. Jin Chunyuan Hotel (近春园宾馆)
2. Conference room: Xi Jie (主会场, 西阶教室)
3. Jia Suo (甲所)
4. Department of Energy and Power Engineering
(机械工程学馆: 能源与动力工程系系馆)

- a. Tsinghua Avenue (清华路)
- b. Jin Chun Avenue (近春路)
- c. Xi Chun Avenue (熙春路)



Tips

● Public Transportation in Beijing

1. Public Buses

Buses are the main means of transportation in Beijing. Please prepare changes before taking a bus. Buses may be very crowded during peak times at 07:00 - 09:00 and 17:00 - 20:00.

2. The Subway

There are currently 17 subway lines and an Airport Express in Beijing. The fare is between RMB 2 and RMB 12 based on the distance. The fare for the Airport Express is RMB 25. It is very convenient to transfer from one subway line to another.

3. Taxis

Taxis in Beijing have several colors. All of them show a taximeter inside. You can easily find them in every part of Beijing. All Taxis will charge RMB 2.3 per kilometer with a base rate or minimum charge of RMB 13 within 3 kilometers.

4. Uber

● Help Lines

Police: 110

Traffic Police: 122

Local Telephone Number Inquiry: 114

Domestic Long Distance Inquiry: 116

Weather forecast: 121

Time Inquiry: 117

Medical emergency call: 120

Fire Alarm: 119

● Electricity

The electric current used in China is 220V 50Hz. Please note that plug adapters and converters might be required. The picture on the right shows



● Printing shop

There is a big printing shop (Wendingwenbo, 文鼎文博) on the first floor of Qingfen Canteen (清芬园), opening from 09:00 to 21:00



Notes

