



TROPICAL AND SUBTROPICAL CYCLONES WITH
IMPROVED SATELLITE OBSERVATIONS

7-10 MAY 2018



WORKSHOP
HANDBOOK

CONTENTS

ABOUT ISSI-BJ	3
ORGANIZERS	4
Conveners	4
Sponsors	4
WORKSHOP OUTLINE AND PROGRAM	5
Context of the workshop	5
Objectives of the workshop	5
Program	6
PRACTICAL INFORMATION	11
Venue	11
WIFI Access	11
Accommodation	12
Lunch	13
Coffee Breaks	13
Useful information	13
Emergency Contact Person in China	13
ISSI-BJ Dinner Location	14
MiRS/NSSC Dinner Location	15
PARTICIPANTS	16
NOTES	19

ABOUT ISSI-BJ

The International Space Science Institute in Beijing (ISSI-BJ) was jointly established by the National Space Science Center (NSSC) and the International Space Science Institute (ISSI) with the support of the International Cooperation Bureau and the Space Science Strategic Project of the Chinese Academy of Sciences (CAS). ISSI-BJ is a close cooperation partner of ISSI in Bern. The two institutes share the same Scientific Program Committee, the same study tools, and other information of mutual relevance and interest. However, both use independent operational methods and different funding sources.

ISSI-BJ is a non-profit research institute. Our main mission is to **contribute to the achievement**

of a deeper scientific and technological understanding of future space missions as well as of the **scientific results** from current and past missions through **multidisciplinary research**, possibly involving, whenever felt appropriate, ground based observations, modelling, numerical simulation and laboratory experiments, using the same tools as ISSI, i.e. **Forums, International Teams, Workshops, Working Groups or individual Visiting Scientists.**

The Program of ISSI-BJ covers a widespread spectrum of space science disciplines, including astrophysics, solar and space physics, planetary science, astrobiology, microgravity science and Earth observation from space.



ORGANIZERS

The Workshop on “Tropical and Subtropical Cyclones with Improved Satellite Observations” is jointly organized by the International Space Science Institute - Beijing (ISSI-BJ) and the International Space Science Institute (ISSI)..

CONVENERS

- Xiaolong Dong, ISSI-BJ/National Space Science Center (NSSC), CAS
- Hui Yu, Shanghai Typhoon Institute, CMA
- Mark Bourassa, Florida State University
- Ji Wu, National Space Science Center (NSSC), CAS
- Anny Cazenave, International Space Science Institute (ISSI)/Laboratoire d'Etudes en Géophysique et Océanographie Spatiales (LEGOS)
- Lennart Bengtsson, Emeritus Scientific Members of Max Planck Institute for Meteorology

SPONSORS



WORKSHOP OUTLINE AND PROGRAM

CONTEXT OF THE WORKSHOP

Tropical cyclones, monsoon depressions and the southwest vortex have significant impacts on a large region from northwestern Pacific Ocean, northern Indian Ocean, to the south Asia subcontinent and most part of China, east Asia and Australia. They are not just key weather and climate factors, but also have significant social impacts and influences on the global and regional circulations and water and energy cycles. The atmospheric, boundary and surface process and their coupling

are needed to investigate the development, variations and the consequences on weather and climate. Improvements in physical understanding should be beneficial for data assimilation and forecasts. Visible optical, infrared and microwave observation from satellites had been used for several decades, along with aircraft observations, to significantly improve analyses and predictions. Recent progresses and improvements of observations promote science and applications.

OBJECTIVES OF THE WORKSHOP

This workshop will review the key science questions of tropical cyclones and the related extreme weather events, and discuss new developments and contributions of satellite observations to these important scientific questions and applications. Contributors cover atmospheric and meteorological research and users, and satellite remote sensing communities. The expected outputs will benefit both science and applications.

The Workshop will cover the following topics:

1. Theory and overview;
2. Observation of ocean surface winds;
3. Observation and sounding of atmospheric thermodynamics and precipitations;
4. Modeling, analysis, assimilation and forecast

PROGRAM

Monday, May 7

	Subject	Contributor
Session 1	Introduction and Overview	Chair: Xiaolong Dong
8:30-9:00	<i>Registration</i>	
9:00-9:15	Welcome and introduction to ISSI-BJ and workshops	Maurizio Falanga
9:15-9:45	Introduction to the Objectives of the Workshop and general plan of the book	Xiaolong Dong
9:45-10:45	Theory and overview of tropical cyclones	Johnny Chan
10:45-11:15	<i>Coffee Break</i>	
11:15-12:00	Tropical cyclone forecast and analysis: progress and challenges	Hui Yu
12:00-13:30	<i>Lunch</i>	
Session 2	Observations of Ocean Surface Wind I	Chair: Xiaolong Dong
13:30-14:10	Development and status of global ocean surface vector wind constellations & NOAA satellite observations for Cyclones	Paul S. Chang
14:10-14:50	Comparison of the strength and weakness of different methods for measurement and retrieval of winds	Zorana Jelenak
14:50-15:30	China ocean satellite missions and observations for tropical cyclones in northwest Pacific	Juhong Zou
15:30-15:50	<i>Coffee Break</i>	
15:50-16:20	Perspective of the dual-frequency FY-3E WindRAD scatterometer for ocean surface wind observations of cyclones	Fangli Dou

Monday, May 7

	Subject	Contributor
16:20-16:50	Estimating hurricane force from satellite microwave measurements	Ad Stoffellen
16:50-17:20	Correlating extremes in wind and stress divergence with extremes in rain over the Tropical Atlantic	
18:30-20:30	<i>Dinner by ISSI-BJ</i>	

Tuesday, May 8

	Subject	Contributor
Session 3	Observations of Ocean Surface Wind II	Chair: Marcos Portabella
9:00-10:00	Overview of satellite observations of ocean surface wind vector	Mark Bourassa (Remotely)
10:00-10:45	The validation of GNSS-R wind retrievals in the hurricane environment	Zorana Jelenak
10:45-11:10	<i>Coffee break</i>	
11:10-12:00	Ocean surface wind observations by L-band microwave observations	Simon Yueh
12:00-13:30	<i>Lunch</i>	
13:30-14:00	Rain effects on scatterometer wind data processing	Wenming Lin
14:00-14:45	Spaceborne Synthetic Aperture Radar (SAR) in tropical cyclone monitoring	Xiaofeng Li/ Xiaofeng Yang
14:45-15:30	Microwave remote sensing of tropical cyclones	Biao Zhang
15:30-15:50	<i>Coffee Break</i>	
15:50-16:20	Extreme wind observations by passive microwave	Xiaobin Yin
16:20-16:45	Combined Active/passive retrieval of wind	Xingou Xu (YS)

Tuesday, May 8

	Subject	Contributor
16:45-17:30	Discussions and plan for the book chapters	Marcos Portabella
17:30-17:40	Wrap up	Xiaolong Dong, Hui Yu

Wednesday, May 9

	Subject	Contributor
Sesssion 4	Observations of Atmospheric Thermodynamics and Precipitations	Chair: Qifeng Lu
8:30-9:20	Satellite observations and its potential to understanding the thermodynamics of cyclone and precipitation	Qifeng Lu
9:20-9:55	High temporal and spatial resolution observations from FY-4A and its capability in tropical cyclones monitoring	Qiang Guo
9:55-10:30	Development of Microwave Capabilities for geostationary observations of tropical cyclones	Hao Liu
10:30-11:00	<i>Coffee Break and Group Photo</i>	
11:00-11:30	Understanding and predicting tropical cyclones with measurements from new generation of weather satellites	Jun Li
11:30-12:00	Operational tropical cyclone monitoring and requirements with multiple spaceborne observations in CMA	Xin Wang (remotely)
12:00-13:30	<i>Lunch</i>	
13:30-14:00	Understanding the role of climate in extreme events for predictability and societal applicability	Swadhin Behera
14:00-14:30	Tropical cyclone reconnaissance by the Hong Kong Observatory	K. K. Hon

Wednesday, May 9

	Subject	Contributor
14:30-15:00	Development of typhoon monitoring system and field experiment in East China	Bingke Zhao
15:00-15:25	Ocean surface pressure by satellite observations	Xiaolong Dong
15:00-15:20	<i>Coffee Break</i>	
15:20-15:50	The operational development of the multi-source merged precipitation dataset and its application	Yan Shen
15:50-16:20	Precipitation in tropical cyclones by microwave observations	Jieying He (YS)
16:20-17:10	Discussions and Book chapter plan	Qifeng Lu
17:10-17:20	Wrap up	Xiaolong Dong, Hui Yu
18:30-20:30	<i>Dinner by MiRS/NSSC</i>	

Thursday, May 10

	Subject	Contributor
Session 5	Modeling, Analysis, Assimilation and Forecast	Chair: Hui Yu
8:30-9:10	The use of EUMETSAT satellite data for tropical storm monitoring	Kenneth Holmlund
9:10-9:50	Assimilation of observations at ECMWF and their impact on tropical cyclones	Mohamed Dahoui
9:50-10:30	Assimilation of satellite data to improve typhoon forecasts at NWPC of CMA	Wei Han
10:30-10:50	<i>Coffee Break</i>	
10:45-11:15	Progress of UPDRAFT project	Yuan Wang
11:15-11:45	Recent advancement of satellite data assimilation with WRFDA	Zhiquan Liu

Thursday, May 10

	Subject	Contributor
11:45-12:15	Intensity detection of Western Pacific typhoons with Deviation Angle Variance Technique	Wei Zhong
12:15-13:30	<i>Lunch</i>	
13:30-14:00	Radar observations of landfalling tropical cyclones in China	Kun Zhao
14:00-14:30	A simulation study on the rapid intensification of typhoon Meranti (2016) based on the assimilation of ATOVS data	Fan Ping
14:30-15:00	A modelling study of rainfall processes associated with tropical cyclone	Xiaopeng Cui
15:00-15:30	The impacts of mineral dust on ice cloud top temperature inferred from satellite observations and WRF simulation	Rui Li
15:30-15:50	<i>Coffee Break</i>	
15:50-16:20	Real-time hybrid EnVAR data assimilation and forecasts for tropical cyclones	Hong Li
16:20-16:50	Parameterizing sea surface temperature cooling induced by tropical cyclones	Xin Liu (YS)
16:50-17:30	Discussion and book chapter plan	Hui Yu
17:30-17:40	Wrap up	Xiaolong Dong, Hui Yu

PRACTICAL INFORMATION

VENUE

The workshop will be held in the Earth Hall, NSSC building A, 4th Floor.

Address

N°1 Nanertiao, Zhongguancun,
Haidian District, Beijing, 100190
北京市海淀区中关村南二条一号

ISSI-BJ Office

The ISSI-BJ office is located at NSSC, Building A, 4th Floor. It is equipped with computers (MS Windows) with CD/DVD drives and USB ports, connected to high-speed network and printer.

WIFI ACCESS

Login via web: NSSC-guest

Username: issi-bj
Password: issi-bj



ACCOMMODATION

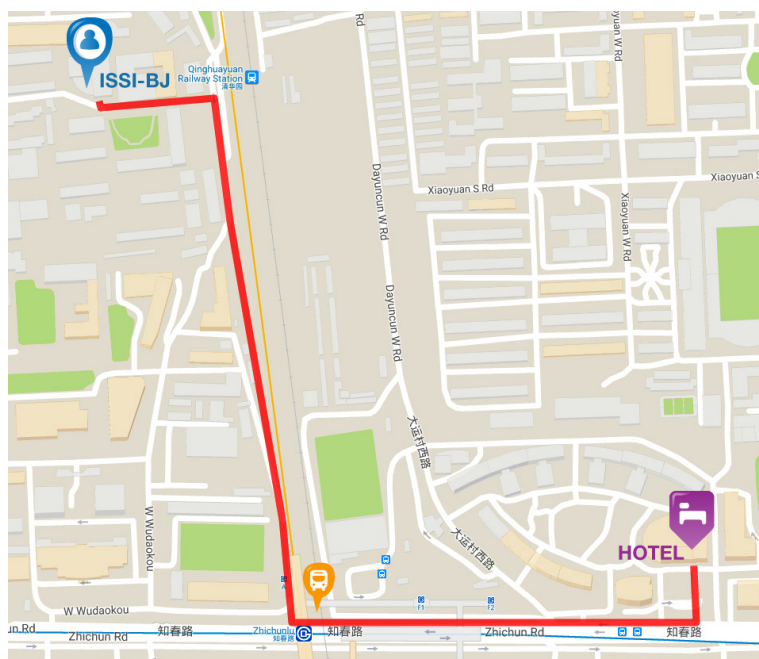
ISSI-BJ covers the cost of the accommodation and breakfast. Please kindly note that all the other expenses in hotel will be deducted from your check-in deposit.

Park Plaza Hotel Beijing Science Park

No.25, Zhichun Road, Haidian District, 100083, Beijing China
北京市海淀区知春路25号

Directions: Turn right on Zhichun Rd. (知春路) when going out of

the hotel. Climb the stairs to the entrance of the metro station ZhiChunLu (Exit A), turn left and walk straight for about two minutes. Then turn right on West Wudaokou (西五道口), following the northbound elevated subway. Walk for about 10 minutes, towards the direction of LiaoNing International Hotel (辽宁大厦) or the National Microgravity Laboratory Tower, finding NSSC (国家空间科学中心) on the left. The way is highlighted in red on the map.



LUNCH

Lunch buffet for all participants of the ISSI-BJ Workshop will be

available at the canteen on the -1 floor of the NSSC building A.

COFFEE BREAKS

Coffee breaks will be provided on the corridor near the Earth Hall, see

Program to check the coffee break times.

USEFUL INFORMATION

Credit Cards: Credit and debit cards can be used in ATMs displaying the appropriate sign. Credit cards are increasingly becoming accepted in major shopping zones and high level restaurants but keep some cash handy just in case.

You can find two ATMs at the NSSC lobby of Building A.

Currency: Chinese Yuan Renminbi (RMB) (1 USD = approx. 6.6 RMB)
(1 EUR = approx. 7.8 RMB)

Drinking Water: Avoid drinking tap water directly. Bottled water and mineral water can be found in convenience stores and drink stalls. The price is 2-10 yuan RMB per bottle.

Electricity: 220 volts AC

Taxi: Please contact Ms. Lijuan EN: +86-139-1139-7464 if you need to book a taxi.

Time: UTC/GMT +8 hours

EMERGENCY CONTACT PERSON IN CHINA

Ms. Lijuan EN +86-139 1139 7464

Ms. Anna YANG +86-185 1002 9307

ISSI-BJ DINNER LOCATION

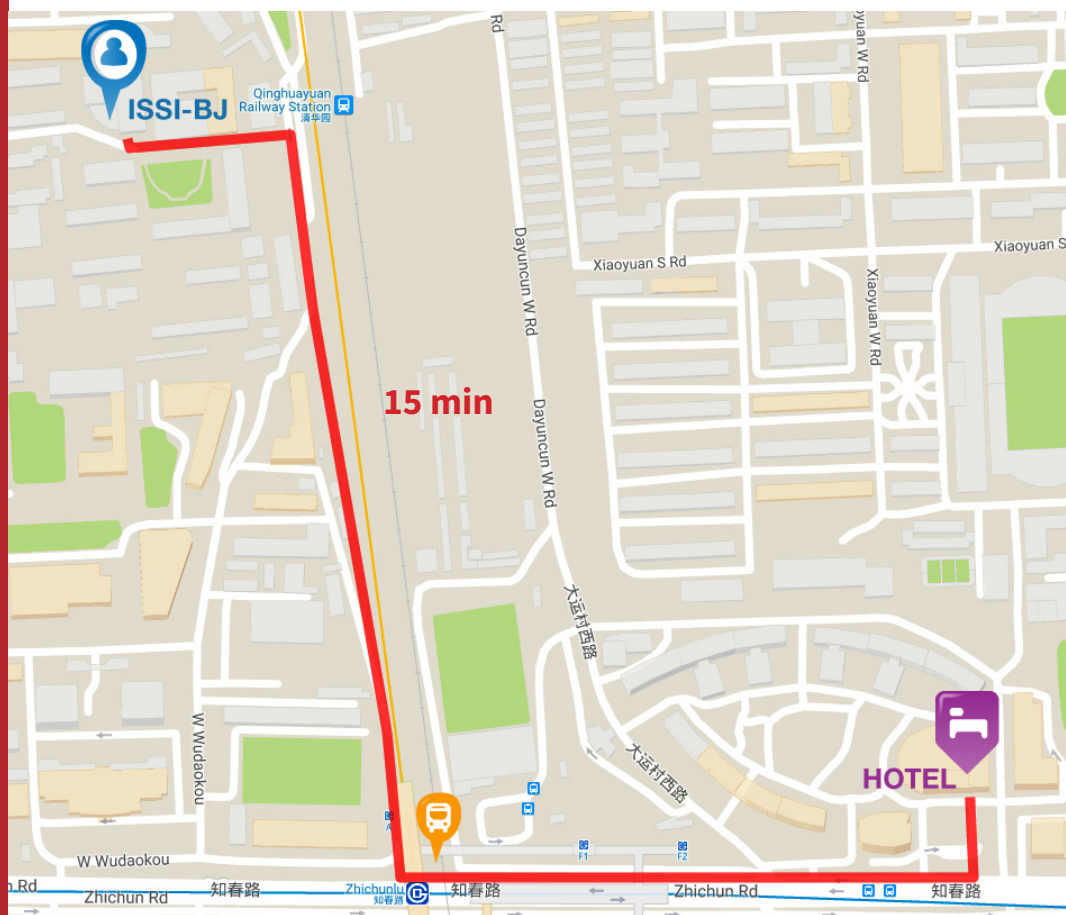
Dinner hosted by ISSI-BJ on
Monday, May 7 at 18:30.

Restaurant:

Amber 6, 2nd Floor of Park Plaza
Beijing Science Park
丽亭华苑酒店金辉6厅

Address:

No. 25 Zhichun Rd. (知春路),
Haidian District, Beijing
北京市海淀区知春路25号

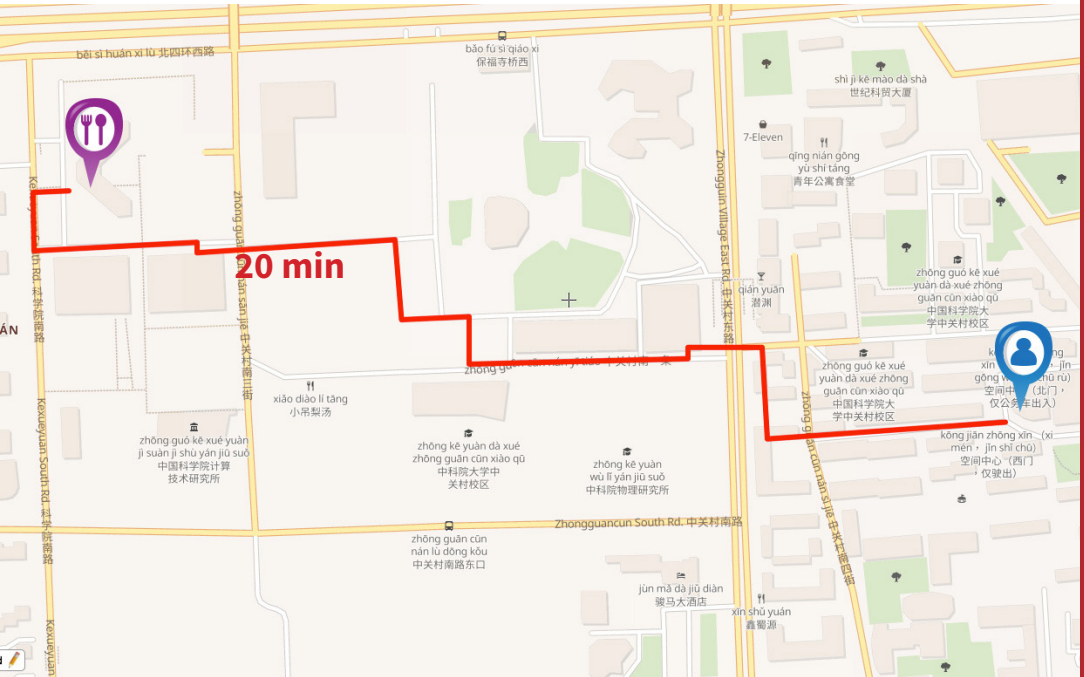


MIRS/NSSC DINNER LOCATION

Dinner hosted by MiRS/NSSC on **Wednesday, May 9 at 18:30.**

Restaurant:
Hua Jia Yiyuan, 1st Floor of Raycom
Infotech Park, Block A
花家怡园, 融科资讯中心A座一层

Address:
No. 2 Kexueyuan S Rd, Haidian
District, Beijing
北京市海淀区科学院南路2号



PARTICIPANTS

No.	First Name	Last name	Institution
CONVENERS			
1	Xiaolong	Dong	ISSI-BJ/National Space Science Center (NSSC), CAS
2	Hui	Yu	Shanghai Typhoon Institute, CMA
3	Mark	Bourassa	Florida State University
4	Ji	Wu	National Space Science Center (NSSC), CAS
5	Anny	Cazenave	International Space Science Institute (ISSI)/ Laboratoire d'Etudes en Géophysique et Océanographie Spatiales (LEGOS)
6	Lennart	Bengtsson	Emeritus Scientific Members of Max Planck Institute for Meteorology
PARTICIPANTS			
7	Swadhin	Behera	Japanese Agency for Marine-Earth Science and Technology (JAMEST)
8	Johnny	Chan	Hong Kong City University
9	Paul S.	Chang	NOAA/NESDIS/Center for Satellite Applications and Research (STAR)
10	Xiaopeng	Cui	Institute of Atmospheric Physics (IAP), CAS
11	Mohamed	Dahoui	European Centre for Medium-Range Weather Forecast (ECMWF)
12	Fangli	Dou	National Satellite Meteorological Center (NSMC), CMA
13	Qiang	Guo	National Satellite Meteorological Center (NSMC), CMA
14	Wei	Han	Numerical Prediction Center (NPC), CMA
15	Kenneth	Holmlund	European Organisation for the Exploitation of Meteorological Satellites (EUMETSAT)
16	K. K.	Hon	Hong Kong Observatory

No.	First Name	Last name	Institution
17	Zorana	Jelenak	NOAA/NESDIS/Center for Satellite Applications and Research (STAR)
18	Hong	Li	Shanghai Typhoon Institute, CMA
19	Jun	Li	University of Wisconsin-Madison
20	Rui	Li	University of Science and Technology of China (USTC)
21	Xiaofeng	Li	NOAA/NESDIS/STAR
22	Wenming	Lin	Nanjing University of Information Science and Technology (NUIST)
23	Hao	Liu	National Space Science Center (NSSC), CAS
24	Zhiquan	Liu	Mesoscale and Microscale Meteorology Laboratory, University Corporation for Atmospheric Research (UCAR)
25	Qifeng	Lu	National Satellite Meteorological Center (NSMC), CMA
26	Fan	Ping	Institute of Atmospheric Physics (IAP), CAS
27	Marcos	Portabella	Institute of Marine Sciences (ICM-CSIC), Spain
28	Yan	Shen	Nation Meteorological Information Center (NMIC), CMA
29	Ad	Stoffellen	Royal Netherlands Meteorological Institute (KNMI)
30	Xin	Wang	National Satellite Meteorological Center (NSMC), CMA
31	Yuan	Wang	Nanjing University
32	Xiaofeng	Yang	Institute of Remote Sensing and Digital Earth (RADI), CAS
33	Xiaobin	Yin	Beijing Piesat Co, Ltd
34	Simon	Yueh	Jet Propulsion Laboratory (JPL), NASA

No.	First Name	Last name	Institution
35	Biao	Zhang	Nanjing University of Information Science and Technology (NUIST)
36	Bingke	Zhao	Shanghai Typhoon Institute, CMA
37	Kun	Zhao	Nanjing University
38	Wei	Zhong	National University of Defense Technology, Nanjing, China
39	Juhong	Zou	National Satellite Ocean Application Service (NSOAS), SOA
40	Maurizio	Falanga	International Space Science Institute - Beijing (ISSI-BJ)
41	Lijuan	En	International Space Science Institute - Beijing (ISSI-BJ)
42	Anna	Yang	International Space Science Institute - Beijing (ISSI-BJ)
YOUNG SCIENTISTS			
43	Jieying	He	National Space Science Center (NSSC), CAS
44	Xin	Liu	Chinese Academy of Meteorological Sciences (CAMS), CMA
45	Xingou	Xu	National Space Science Center (NSSC), CAS

NOTES



Forum website:

<http://www.issibj.ac.cn/Program/Workshops/Cyclones/>



Advancing Space Science Research
by Worldwide Collaboration

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