

**Summer School on Multiscale Convection  
of the Severe Weather International Consortium  
(SWIC)**

**Organized by Zhiyong Meng from Peking University  
and Fuqing Zhang from Pennsylvania State University**

**27–30 May, 2019**

**Department of Atmospheric and Oceanic Sciences**

**School of Physics, Peking University**

**Monday, 27 May 2019**

**Venue: W301 School of Physics, Peking University**

- 08:10-08:30    Opening address and introduction
- 08:30-10:00    Convection and weather  
                  **Fuqing Zhang**, Pennsylvania State University
- 10:00-10:30    Group Photo & Break
- 10:30-12:20    Convection and climate  
                  **Ruby Leung**, Pacific Northwest National Laboratory
- 12:20-13:30    Lunch
- 
- 13:30-15:00    Coupling of gravity waves and convection  
                  **Fuqing Zhang**, Pennsylvania State University
- 15:00-15:20    Break
- 15:20-16:50    Modeling of convective precipitation in regional and global climate models  
                  **Ruby Leung**, Pacific Northwest National Laboratory
- 16:50-17:20    Emergence of convectively coupled synoptic-scale disturbances from the Asian  
                  monsoon basic state  
                  **William Boos**, University of California, Berkeley
- 17:20            Discussion

**Tuesday, 28 May 2019**

**Venue: W301 School of Physics, Peking University**

- 08:40-10:10    Impacts of aerosol-cloud and land-atmosphere interactions on hydroclimate  
**Ruby Leung**, Pacific Northwest National Laboratory
- 10:10-10:30    Break
- 10:30-12:00    Limits of atmospheric predictability  
**Fuqing Zhang**, Pennsylvania State University
- 12:00-13:30    Lunch
- 13:30-15:00    Ensemble Data Assimilation for Severe Storms with Radar and Satellite  
**Yunji Zhang**, Pennsylvania State University
- 15:00-15:20    Break
- 15:20-16:50    A Tutorial for Tornado Damage Survey  
**Zhiyong Meng**, Peking University; **Lanqiang Bai**, Sun Yat-Sen University
- 16:50            Discussion

**Wednesday, 29 May 2019**

**Venue: W301 School of Physics, Peking University**

- 08:40-10:10    Potential Vorticity (PV) Dynamics  
                  **Chris Davis**, National Center for Atmospheric Research
- 10:10-10:30    Break
- 10:30-12:00    PV and Moist Convection  
                  **Chris Davis**, National Center for Atmospheric Research
- 12:00-13:30    Lunch
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- 13:30-15:00    Tropical Cyclone Data Assimilation  
                  **Robert Nystrom**, Pennsylvania State University
- 15:00-15:20    Break
- 15:20-17:10    Tropical Cyclone Formation  
                  **Chris Davis**, National Center for Atmospheric Research
- 17:10            Discussion

## **Thursday, 30 May 2019**

**Venue: W301 School of Physics, Peking University**

- 08:40-10:10 Ordinary Convective Cells  
**Richard Rotunno**, National Center for Atmospheric Research
- 10:10-10:30 Break
- 10:30-12:00 Global distribution of convective systems from satellites  
**Chuntao Liu**, Texas A&M University - Corpus Christi
- 12:00-13:30 Lunch
- 13:30-15:00 Squall Lines  
**Richard Rotunno**, National Center for Atmospheric Research
- 15:00-15:20 Break
- 15:20-16:50 Supercells  
**Richard Rotunno**, National Center for Atmospheric Research
- 16:50 Discussion

**End of Summer School**

# **3<sup>rd</sup> International Workshop of the Severe Weather**

## **International Consortium (SWIC)**

**Organized by Zhiyong Meng from Peking University  
and Fuqing Zhang from Pennsylvania State University**

**31 May–2 June, 2019**

**Department of Atmospheric and Oceanic Sciences**

**School of Physics, Peking University**

**Friday, 31 May 2019**

**Venue: W301 School of Physics, Peking University**

**Opening Ceremony**

**Chair: Zhiyong Meng, Peking University**

08:30-09:00 Opening address and introduction

**Session 1 Convection Predictability**

**Chair: Zhiyong Meng, Peking University**

09:00-09:30 Predictability of Convection

**Richard Rotunno, National Center for Atmospheric Research (Keynote)**

09:30-10:00 A new theoretical framework for understanding multi scale atmospheric predictability

**Fuqing Zhang, Pennsylvania State University (Keynote)**

10:00-10:20 Improving analysis and probabilistic prediction of a severe thunderstorm event using remote-sensing observations with an ensemble Kalman filter

**Yunji Zhang, Pennsylvania State University**

10:20-10:50 Group Photo & Coffee Break

**Session 2 Convection Forecast**

**Chair: Shuguang Wang, Nanjing University & Columbia University**

10:50-11:20 Predictor Reconstitution Method for Weather Forecasting in the Alpine Region

**Pingwen Zhang, Peking University (Keynote)**

11:20-11:40 Review of Severe Convective Weather Prediction over China since 1950

**Xiaoling Zhang, National Meteorological Center**

11:40-12:00 Convective Storm Nowcasting Using a Deep Learning Approach

**Lei Han, Ocean University of China**

12:00-13:30 Lunch Break

**Session 3 Convection Modeling**

**Chair: Jianhua Sun, Institute of Atmospheric Physics**

13:30-14:00 Large-eddy Simulation of Extreme Updrafts in the Tropical Cyclone Eyewall

**Liguang Wu, Fudan University (Keynote)**

14:00-14:20 The aerosol-cloud interaction in deep convective systems

**Huiwen Xue, Peking University**

- 14:20-14:40 Key Elements of Turbulence Closures for Simulating Deep Convection at Kilometer-Scale Resolution  
**Xiao Ming Shi**, Hong Kong University of Science and Technology
- 14:40-15:00 Beyond Traditional Limits of Gravity Wave Parameterizations  
**Junhong Wei**, Sun Yat-Sen University
- 15:00-15:20 Progresses of CMA GRAPES Mesoscale Ensemble Prediction System  
**Jing Chen**, Numerical Weather Prediction Center, CMA
- 15:20-15:40 Coffee Break

#### **Session 4 Convection Climatology**

**Chair: Yunji Zhang**, Pennsylvania State University

- 15:40-16:10 The effects of boundary layer inertial oscillation on precipitation diurnal cycles in different parts of China  
**Ming Xue**, University of Oklahoma (**Keynote**)
- 16:10-16:30 Hailstorms in China: climatology, long-term trend and predictability  
**Qinghong Zhang**, Peking University
- 16:30-16:50 Organizational Modes of Severe Wind-producing Convective Systems over North China  
**Jianhua Sun**, Institute of Atmospheric Physics
- 16:50-17:10 A Database of Convection Initiation in South China  
**Lanqiang Bai**, Sun Yat-Sen University
- 17:10-17:30 How Boundary Layer Convergence Lines and Their Associated Convection Respond to Sharp Vegetation Contrast: A Five-Year Summertime Radar Climatology  
**Yipeng Huang**, Xiamen Meteorological Bureau



**Saturday, 1 June 2019**

**Venue: W301 School of Physics, Peking University**

**Session 5 Convection Environment**

**Chair: Yali Luo**, Chinese Academy of Meteorological Sciences

- 08:30-09:00 Mesoscale Convective Systems and Their Large-Scale Environments  
**Ruby Leung**, Pacific Northwest National Laboratory (**Keynote**)
- 09:00-09:30 Large-scale thermodynamic environments favoring intense convection: A perspective from satellite observations  
**Chuntao Liu**, Texas A&M University - Corpus Christi (**Keynote**)
- 09:30-09:50 Deep convection and flow regimes over tropical islands  
**Shuguang Wang**, Nanjing University & Columbia University
- 09:50-10:10 The Mid-latitude influences on the formation of the monsoon gyre in August 1991  
**Xuyang Ge**, Nanjing University of Information Science & Technology
- 10:10-10:30 Coffee Break

**Session 6 Heavy Rainfall I**

**Chair: Kun Zhao**, Nanjing University

- 10:30-11:00 Urbanization and extreme rainfall  
**Dalin Zhang**, Maryland University (**Keynote**)
- 11:00-11:20 Synoptic analysis of extreme hourly precipitation in China mainland and Taiwan  
**Yali Luo**, Chinese Academy of Meteorological Sciences
- 11:20-11:40 Regional features of extreme precipitation: adiabatic forcing and diabatic feedback  
**Ji Nie**, Peking University
- 11:40-12:00 Warm-sector heavy rainfall and LLJ  
**Zhiyong Meng**, Peking University
- 12:00 Lunch Break

## **Session 7 Heavy Rainfall II**

**Chair: Guixing Chen**, Sun Yat-Sen University

- 13:30-14:00 A comparison of the rainfall forecasting skills of the WRF ensemble forecasting system using SPCPT and other cumulus parameterization error representation schemes  
**Jinzhong Min**, Nanjing University of Information Science & Technology  
**(Keynote)**
- 14:00-14:20 Developing atmospheric large-scale forcing data for single-column and loud resolving modeling and precipitation processes  
**Donghai Wang**, Sun Yat-Sen University
- 14:20-14:40 Impacts of mesoscale orography on the summer precipitation in East China  
**Xin Xu**, Nanjing University
- 14:40-15:00 How do weak or dry landfalling tropical cyclones produce heavy rainfall over China  
**Shoujuan Shu**, Zhejiang University
- 15:00-15:20 Coffee Break

## **Session 8 Heavy Rainfall III**

**Chair: Chuntao Liu**, Texas A&M University - Corpus Christi

- 15:20-15:50 A progress about WMO/UPDRAT  
**Yuan Wang**, Nanjing University **(Keynote)**
- 15:50-16:10 Influence of Synoptic Pattern and Low-Level Wind Speed on Intensity and Diurnal Variations of Summer Rainfall along the Coast of South China  
**Kun Zhao**, Nanjing University
- 16:10-16:30 Diurnal cycle of the successive MCSs in response to large-scale circulation over East Asia  
**Guixing Chen**, Sun Yat-Sen University
- 16:30-16:50 Impact of Gravity Waves on Diurnal Cycle of Rainfall near the Coasts  
**Yu Du**, Sun Yat-Sen University
- 16:50-17:10 Impact of moisture and surface wind on the diurnal variability of precipitation over Hainan Island  
**Lei Zhu**, Nanjing University of Information Science & Technology
- 17:10-17:30 Predictability, Uncertainties and Underlying Dynamics in the Limited Predictability of the Record-Breaking Intensification of Hurricane Patricia (2015)  
**Robert Nystrom**, Pennsylvania State University

**Sunday, 2 June 2019**

**Venue: W301 School of Physics, Peking University**

**Session 9 Tropical Cyclone I**

**Chair: Qinghong Zhang**, Peking University

08:30-09:00 The Basic Mechanism of Tropical Cyclone Formation

**Chris Davis**, National Center for Atmospheric Research (**Keynote**)

09:00-09:30 The Air-Sea Interaction and Formation of the Secondary Eyewall in Typhoon  
Sinlaku of 2009

**Hancheng Lu**, National University of Defense Technology (**Keynote**)

09:30-09:50 The diurnal cycle and gravity waves during the formation of Typhoon Megi (2010)

**Juan Fang**, Nanjing University

09:50-10:10 Impacts of the Diurnal Radiation Contrast on the Formation, Intensification and  
Structure of TC

**Xiaodong Tang**, Nanjing University

10:10-10:30 Coffee Break

**Session 10 Tropical Cyclone II**

**Chair: Juan Fang**, Nanjing University

10:30-11:00 Intensification Variability of Tropical Cyclones in Directional Shear Flows: Vortex  
Tilt-Convection Coupling

**Zheming Tan**, Nanjing University (**Keynote**)

11:00-11:30 Why is the progress in improving tropical cyclone intensity forecast so slow, and  
any hope?

**Yuqing Wang**, Hawaii University (**Keynote**)

11:30-11:50 Targeted observing to improve typhoon forecasts using FY-4A satellite

**Wei Han**, National Meteorological Center

11:50 Lunch Break

**End of the Workshop**

# Map of PKU CAMPUS

## 北京大学物理学院大气与海洋科学系地图位置



联系方式：电话 010-62765802

网址 <http://www.atmos.pku.edu.cn/>

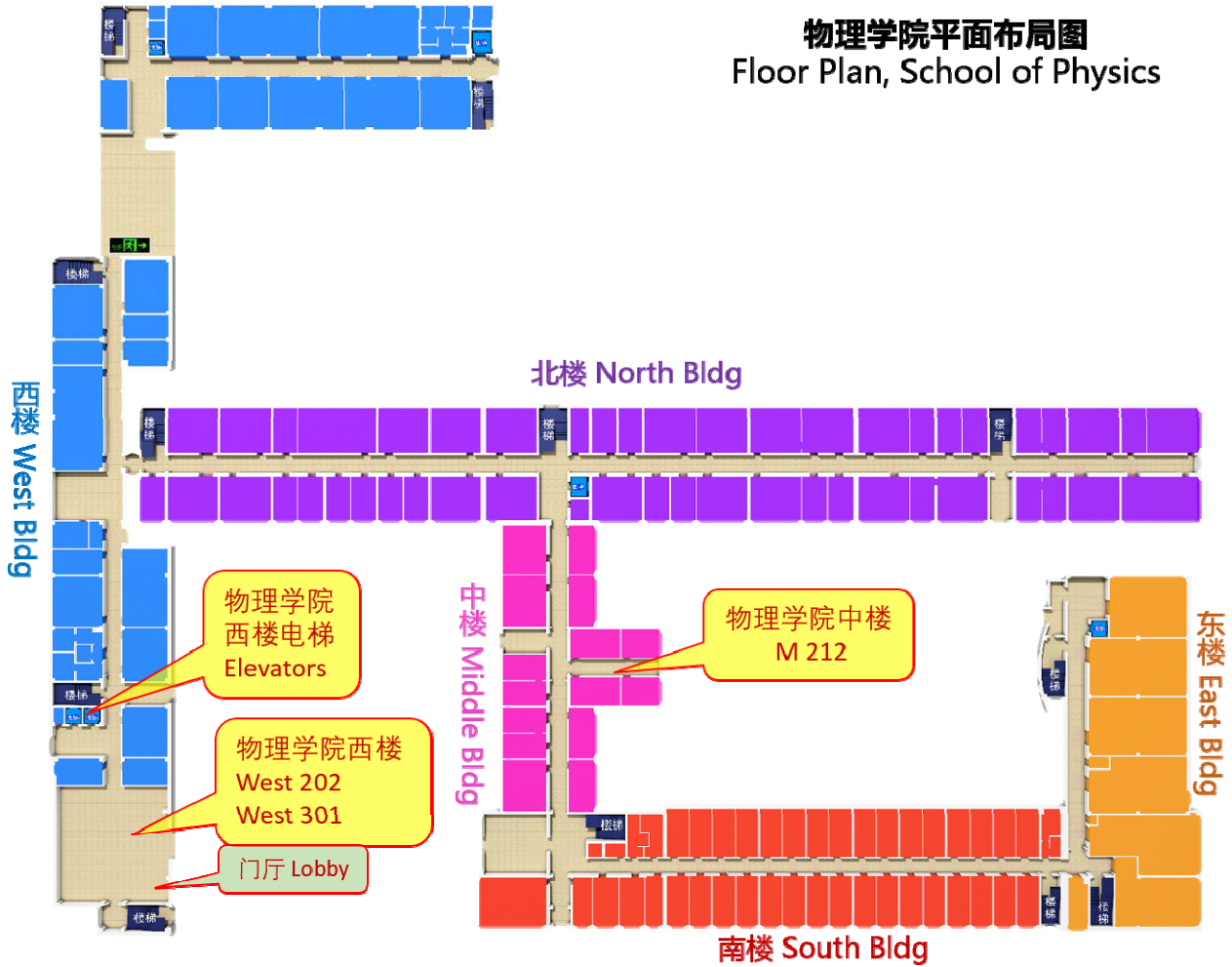
## Map of Department of Atmospheric and Oceanic Sciences, School of Physics, Peking University



Contact: Phone: 010-62765802

Web: <http://www.atmos.pku.edu.cn/>

# Floor Plan of School of Physics



# Traffic Instructions

## **From Beijing Capital International Airport to School of Physics, Peking University**

1. By taxi: The distance between the airport and Peking University is about 30 kilometers. It takes about 45 minutes and costs about ¥120.

2. By subway: Take the Beijing Subway Airport Express (costs ¥25) to Sanyuanqiao(三元桥) Station, transfer to Line 10 (costs ¥3 ~¥5) to Haidian Huangzhuang Station (海淀黄庄) , then transfer to Line 4 (towards Anheqiao North Station (安河桥北) ) and get off at the East Gate of Peking University Station (北京大学东门) . Exit from the Exit B to the School of Physics.

## **From high-speed railway station to School of Physics, Peking University**

1. Beijing Station: Take Line 2 (inner ring) to the Xuanwu Gate Station (宣武门) , transfer to Line 4 (towards Anheqiao North Station (安河桥北) ) and get off at the East Gate of Peking University Station (北京大学东门) . Exit from the Exit B to the School of Physics.

2. Beijing South Railway Station (北京南站) : Take Line 4 and get off at the East Gate of Peking University Station (北京大学东门) . Exit from the Exit B to the School of Physics.

3 Beijing West Railway Station (北京西站) : Take Line 9 to the National Library Station (国家图书馆) , transfer to Line 4 (towards Anheqiao North Station (安河桥北) ) and get off at the East Gate of Peking University Station (北京大学东门) . Exit from the Exit B to the School of Physics.