

2017 SPHERIC Beijing International Workshop Handbook

Sponsor organizations:

National Natural Science Foundation of China (NSFC)
Chinese Society of Theoretical and Applied Mechanics (CSTAM)
College of Engineering, Peking University
Institute of Ocean Research, Peking University
BIC-ESAT, Peking University
State Key Laboratory of Turbulence and Complex System, PKU

Peking University, China

中国
北京



2017 SPHERIC Beijing International Workshop

Handbook



October 17-20, 2017



WELCOME MESSAGE

Dear Delegates

The College of Engineering of Peking University is delighted to host the 2017 SPHERIC Beijing International Workshop (or **SPHERIC Beijing 2017**). This is an important event of 2017 in the field of Smoothed Particle Hydrodynamics (SPH) and related particle-based methods.

The SPH European Research Interest Community (SPHERIC) was founded in 2005 as a Special Interest Group of the ERCOFTAC community and aims at encouraging and facilitating the spread of the method throughout Europe and the wider international community. Since that time, the SPHERIC community continues both to grow and to play an important role in helping the development of SPH for academia, industry and government organizations. SPH is one of the most exciting new areas in the field of computational methods and is opening up the possibility of research into fields that were beyond any modelling capability.

The SPHERIC Beijing 2017 organization committee received abstracts from China, France, Germany, UK, Italy, Spain, Switzerland, Ireland, USA, Japan and Australia, while 56 abstracts were selected to present in the SPHERIC Beijing 2017. This demonstrates just how active the field is, with works ranging from traditional hydrodynamics to solids, fluid-structure interaction, high performance computing and industrial applications.

The SPHERIC Beijing 2017 has been supported by the National Natural Science Foundation of China (NSFC), the Chinese Society of Theoretical and Applied Mechanics (CSTAM), Beijing Innovation Centre for Engineering Science and Advanced Technology (BIC-ESAT), Institute of Ocean Research and State Key Laboratory for Turbulence and Complex Systems of Peking University, and Beijing Paratera Technology Co. Ltd.

It is a great pleasure to welcome you all to Beijing, and share a successful and enjoyable meeting with you.



Moubin Liu

Professor, Peking University
Chair, Local Organization Committee
SPHERIC Beijing 2017

ACKNOWLEDGEMENT

SPHERIC Beijing 2017 has been supported by

National Natural Science Foundation of China (NSFC)



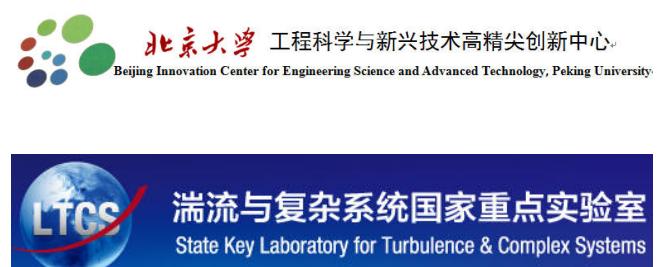
Chinese Society of Theoretical and Applied Mechanics (CSTAM)



Institute of Ocean Research, Peking University



Beijing Innovation Centre for Engineering Science and Advanced Technology (BIC-ESAT), Peking University



State Key Laboratory for Turbulence and Complex Systems, Peking University



Beijing Paratera Technology Co. Ltd.

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ABOUT SPHERIC

SPHERIC, or “SPH European Research Interest Community”, is the international organisation representing the community of researchers and industrial users of Smoothed Particle Hydrodynamics (SPH), aims to promote the SPH method in both academic and industrial fields and enhance collaborations between countries and institutes. It was recognized as a Special Interest Group (SIG) within Ercftac in January 2006.

As a purely Lagrangian technique, SPH enables the simulation of highly distorting fluids and solids. Fields including free-surface flows, solid mechanics, multi-phase, fluid-structure interaction and astrophysics where Eulerian methods can be difficult to apply represent ideal applications of this meshless method.

The SPH method was developed to study non-axisymmetric phenomena in astrophysics in the 1970s, but its application to engineering emerged in the 1990s and early 2000s. In the past twenty years the method has developed rapidly in many fields of application from impacts to fracture to breaking waves and fluid-structure interaction.

Following the impulse generated by a collection of local initiatives in 2005 (France, UK, Italy...), a need to foster and collaborate efforts and developments was identified. Since then, the SPHERIC organisation has gone on to push the development of the method forward providing a network of researchers and industrial users around the world as a means to communicate and collaborate.

For more information about SPHERIC, please visit <http://spheric-sph.org>

SPHERIC Beijing 2017

You are cordially invited to attend the 2017 SPHERIC Beijing International Workshop (SPHERIC Beijing 2017) to be held at Peking University (PKU) in Beijing China, from October, 17-20, 2017. This is the first time that the SPHERIC Workshop is held outside Europe.

The SPHERIC workshops are the only worldwide events which exclusively focus on the Smoothed Particle Hydrodynamics (SPH) methodology and related simulation approaches. SPH has recently gained enhanced attention in the area of scientific computing. Exemplary applications refer to the development of galaxies in astrophysics, environmental engineering, applied solid mechanics, marine and coastal engineering, nuclear power engineering, medical engineering or geotechnical problems.

The successful concept of SPHERIC is due to a methodological focus in an interdisciplinary application environment, integrating the know-how of physicists, mathematicians, IT experts and engineers from academia and industry. On behalf of the organizing team, it is a pleasure and honor to us to invite scientists and researchers to the SPHERIC 2017 at PKU, in Beijing, China.

For more information about SPHERIC Beijing 2017, please visit http://ocean.pku.edu.cn/SPHERIC_Beijing/index.php.htm

ABOUT PEKING UNIVERSITY

General Information

Peking University is a comprehensive and national key university. The campus, known as "Yan Yuan" (the garden of Yan), is situated at Haidian District in the western suburb of Beijing, with a total area of 2,743,532 square metres (or 274 hectares). It stands near to the Yuanmingyuan Garden and the Summer Palace.

Peking University is proud of its outstanding faculty, including 53 members of the Chinese Academy of Sciences (CAS), 7 members of the Chinese Academy of Engineering (CAE), and 14 members of the Third World Academy of Sciences (TWAS).

The university has effectively combined research on important scientific subjects with the training of personnel with a high level of specialized knowledge and professional skill as demanded by the country's socialist modernization. It strives not only for improvements in teaching and research work, but also for the promotion of interaction and mutual promotion among various disciplines.

Thus Peking University has become a center for teaching and research and a university of a new type, embracing diverse branches of learning such as basic and applied sciences, social sciences and the humanities, and sciences of medicine, management, and education. Its aim is to rank among the world's best universities in the future.

History

Founded in 1898, Peking University was originally known as the Imperial University of Peking. It was the first national university covering comprehensive disciplines in China, and has been a leading institution of higher education in China since its establishment. It also served as the highest administration for education at the beginning of its founding.

In 1912, the university adopted its present name. At the end of the 20th century, the Chinese government put Peking University at the top of its agenda for promoting higher education, with the aim to build a world-class university in the 21st Century. After merging with Beijing Medical University in 2000, Peking University once again was strengthened in its disciplinary structure.

Peking University has continually played the essential role of pioneers in the course of China's modernization. The university's traditional emphasis on patriotism, progress, democracy, and science, together with its educational standards of diligence, precision, factualism, and innovation, have been passed down from generation to generation.

WORKSHOP DETAILS

Committees

Scientific Committee

- Prof. David Le Touzé (Ecole Centrale de Nantes, France)
- Dr. Damien Violeau (Electricité de France, France)
- Dr. Nathan Quinlan (National Univ. of Ireland, Ireland)
- Dr. Ben Rogers (University of Manchester, UK)
- Prof. Stefano Sibilla (University of Pavia, Italy)
- Dr. Jean-Christophe Marongiu (ANDRITZ Hydro, France)
- Dr. Alex Crespo (Universidade de Vigo, Spain)
- Dr. Andrea Colagrossi (INSEAN, Italy)
- Dr. Xiangyu Hu (Technical University of Munich, Germany)
- Prof. Rade Vignjevic (Brunel University of London, UK)
- Prof. Thomas Rung (Technical University of Hamburg-Harburg, Germany)
- Dr. Antonio Souto-Iglesias (Technical University of Madrid, Spain)
- Dr. Renato Vacondio (University of Parma, Italy)
- Dr. Matthieu De Leffe (Nextflow Software, France)
- Prof. Moncho Gómez-Gesteira (Universidade de Vigo, Spain)
- Dr. Abbas Khayyer (University of Kyoto, Japan)
- Prof. Walter Dehnen (University of Leicester, UK)
- Dr. Raj Das (University of Auckland, New Zealand)
- Prof. Robert A. Dalrymple (Johns Hopkins University , USA)
- Prof. Alexis Hérault (Conservatoire National des Arts et Métiers, France)
- Prof. Joe Monaghan (Monash University, Australia)
- Prof. Peter Eberhard (University of Stuttgart, Germany)
- Prof. Moubin Liu (Peking University, China)
- Dr Mehmet Yildiz (Sabanci University, Turkey)

Organizing Committee

Chair

- Prof. M. B. Liu, Peking University

Co-Chairs

- Prof. H. F. Qiang, Xi'an Hi-Tech Institute, China
- Prof. A. M. Zhang, Harbin Engineering University, China
- Prof. L. Zou, Dalian University of Technology, China
- Prof. D. A. Hu, Hunan University, China
- Prof. F. Xu, Northwestern Polytechnical University, China
- Prof. Z. R. Li, Wenzhou University, China

Keynote Speakers

Prof. David Le Touzé

Ecole Centrale Nantes

Deputy Head, LHEEA research dept. (ECN and CNRS)

Head, H2I research group of LHEEA

Head, Centrale Nantes - Bureau Veritas Chair

Head, IRT Jules Verne SimAvHy Chair

Title: Smoothed Particle Hydrodynamics, fact checking: from theory to applications

Bio: Prof. David LE TOUZÉ is 40 years old. He got his MSc in Hydrodynamics and Ocean Engineering from Ecole Centrale Nantes (Nantes, France) in 2000. Ecole Centrale Nantes is a highly competitive French « Grande Ecole » which awards MScs and PhDs only. He then got his PhD with honors in 2003 from the same institute, whose topic was modeling gravity wave generation and propagation by spectral methods. He spent 2 years of post-doc at CNR-INSEAN (Rome, Italy) in 2004-05 where he started working in SPH. He came back to Ecole Centrale Nantes in 2006 and became Assistant Professor in 2007, Associate Professor in 2010 and Full Professor in 2012. His researches revolve mainly around free-surface flows. He is leading since 2012 a research group on Hydrodynamics, Interfaces and Interactions (H2i) which counts 8 professors and researchers, 14 PhD students, and 6 post-docs. His current research topics cover different numerical methods and techniques: SPH (Smoothed Particle Hydrodynamics), incompressible (OpenFOAM) and weakly-compressible (WCCH) Finite Volumes, Adaptive Mesh Refinement (AMR), Immersed Boundary Method (IBM), Vortex Method (DVH), Lattice-Boltzmann Method (LBM). He is also working on different method couplings: potential (waves) to Navier-Stokes Finite Volume Method for wave-structure interactions, SPH to Finite Element Method (FEM) for fluid-structure interaction, SPH to Finite Volume Method for efficient solutions of complex flows. Main applications of his research are in the fields of marine engineering (many naval, offshore and marine renewable energy topics), automotive (aquaplaning, gear boxes), aeronautics (ditching) and health (cardio-vascular flows). He is currently leading 7 industrial projects (over 5M contracts). He is the author of 30+ journal publications, with a google h-index of 22. He is also Deputy Head of his research department (LHEEA, 140 staff) which is a joint research unit between Ecole Centrale Nantes and CNRS.

Prof. J. S. Chen

William Prager Chair Professor, Structural Engineering Department, Director, Center for Extreme Events Research, University of California, San Diego

Title: An Implicit Gradient Reproducing Kernel Particle Method: Theory and Applications

Bio: J. S. Chen earned his undergraduate degree from National Central University (1978-1982) in Taiwan, and received master's (1986) and Ph.D. (1989) from Northwestern University. He worked in GenCorp's Research Division from 1989 to 1994. From 1994 to 2001, he held a faculty position in the Mechanical Engineering Department of The University of Iowa before moving to UCLA in 2001, where he served as the Chair of Civil & Environmental Engineering Department from 2007 to 2012. He was the Chancellor's Professor in the Civil & Environmental Engineering Department at UCLA and also Professor of Mechanical & Aerospace Engineering Department and Mathematics Department. In 2013, he joined the Structural Engineering Department of UCSD as the inaugural holder of the William Prager Endowed Chair. He also is the director of the Center for Extreme Events Research at the Jacobs School of Engineering at UC San Diego.

Conference Venue

The SPHERIC Beijing 2017 will be held at Peking University, Beijing, China.

- Address: No.5 Yiheyuan Road Haidian District, Beijing, P.R.China
- Tel: +86 1062 766 982
- Website: http://ocean.pku.edu.cn/SPHERIC_Beijing/index.php.htm

Accommodation

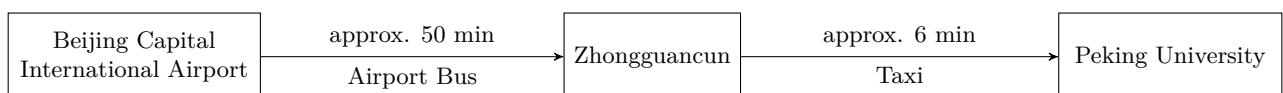
For participants outside China, the committee has reserved rooms at **ZhongGuanYuan Global Village PKU** at discounted prices. It should be noted that the registration fee does not include accommodation. All of the hotels below include breakfast and wifi access.

- Address: No.126 ZhongGuanCun North Street, Haidian District, Beijing, China
- Tel: +86 10 62752288
- Website: <http://www.pkugv.com>

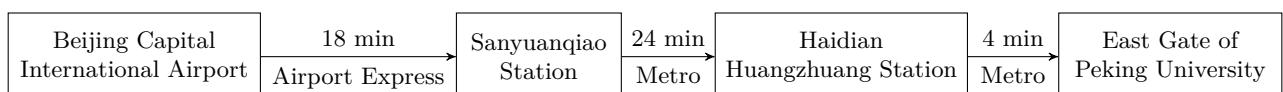
Transportation Information

TAXI Taxi is the most convenient transportation to the University from the airport. As the Capital Airport is located 40 km northeast from the campus, it will cost you around 100-130 RMB (expressway fee of 15 RMB included) to get to the university from the airport. It takes approximately 1-1.5 hours to arrive at PKU from the airport, depending on the traffic.

Getting to PKU from the Airport BUS You may also first travel to ZhongGuanCun via the airport shuttle bus and then take a taxi from ZhongGuanCun.



You may also take the subway. Take the Line ‘Airport Express’ from Terminal 2 or Terminal 3, and transfer to Line 10 at the ‘Sanyuanqiao’ station, and then transfer to the Line 4 at ‘Haidian Huangzhuang’ station, and finally get off at ‘The East Gate of Peking University’ station.



Registration/Information Desk

The registration desk at Room 104 in the Peking University Overseas Exchange Center, will be open from 8:30-18:00 on Tuesday 17th October.

Instructions for Presenters

- According to SPHERIC Workshop Presentation Style, each presenter will have 13 minutes strictly to present their work, followed by the successive presenter. After all the presentations in a specific session, all the presenters will be asked to stand in front of the conference room and answer possible questions in a Group.
- There is no need to explain the very basics of SPH to an SPH specialist audience, and please emphasize what is new and novel in method or application.

SPH Training Day

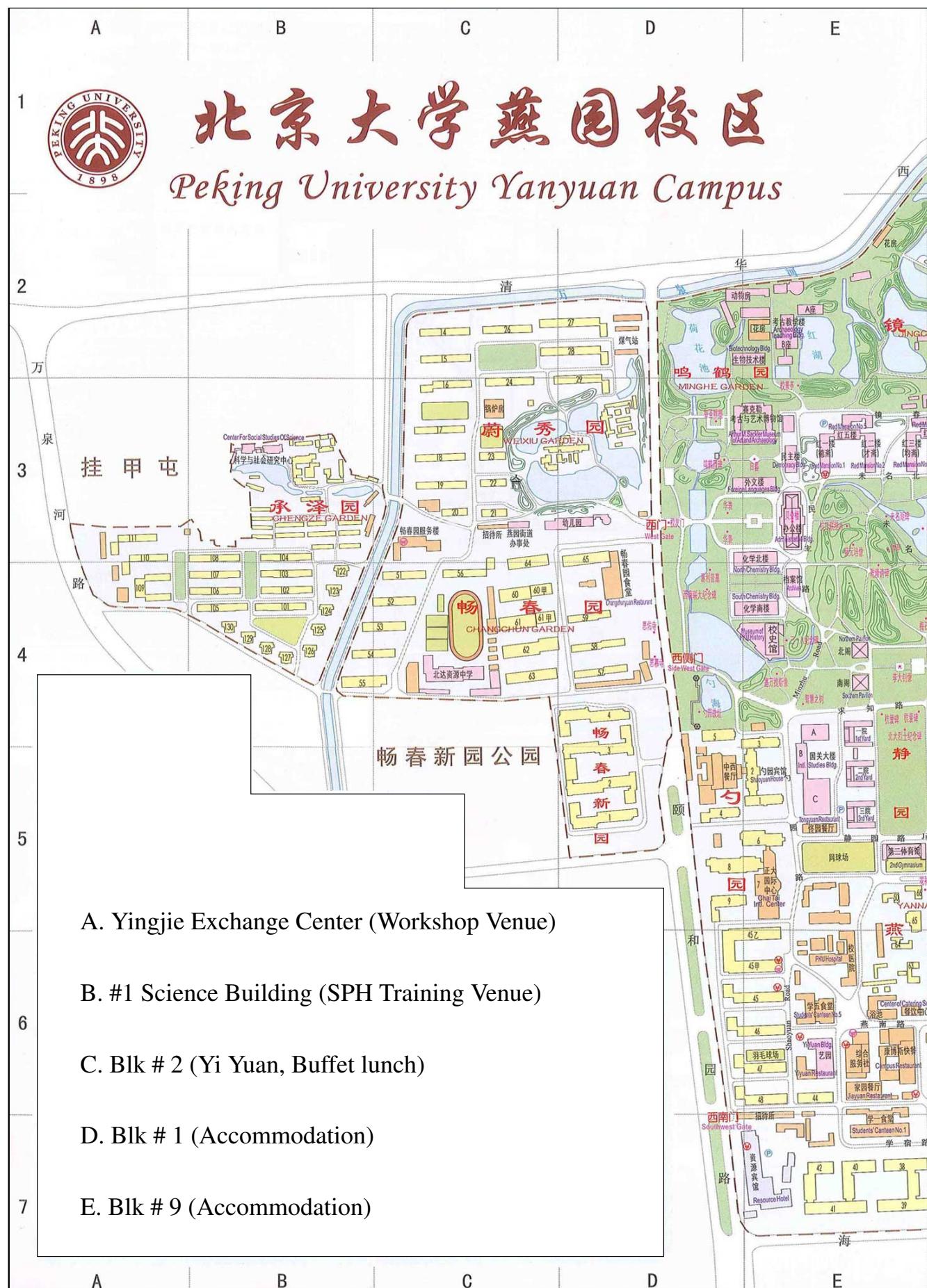
Supplementary to the workshop, an SPH training day will be offered on 17 October 2017. The training is most suitable for researchers who are familiar with the principles of SPH but are beginning their work in the field. More experienced SPH developers and users may find that the training day is a useful opportunity for sharing insights and ideas. The SPH training day will also take place at the Peking University.

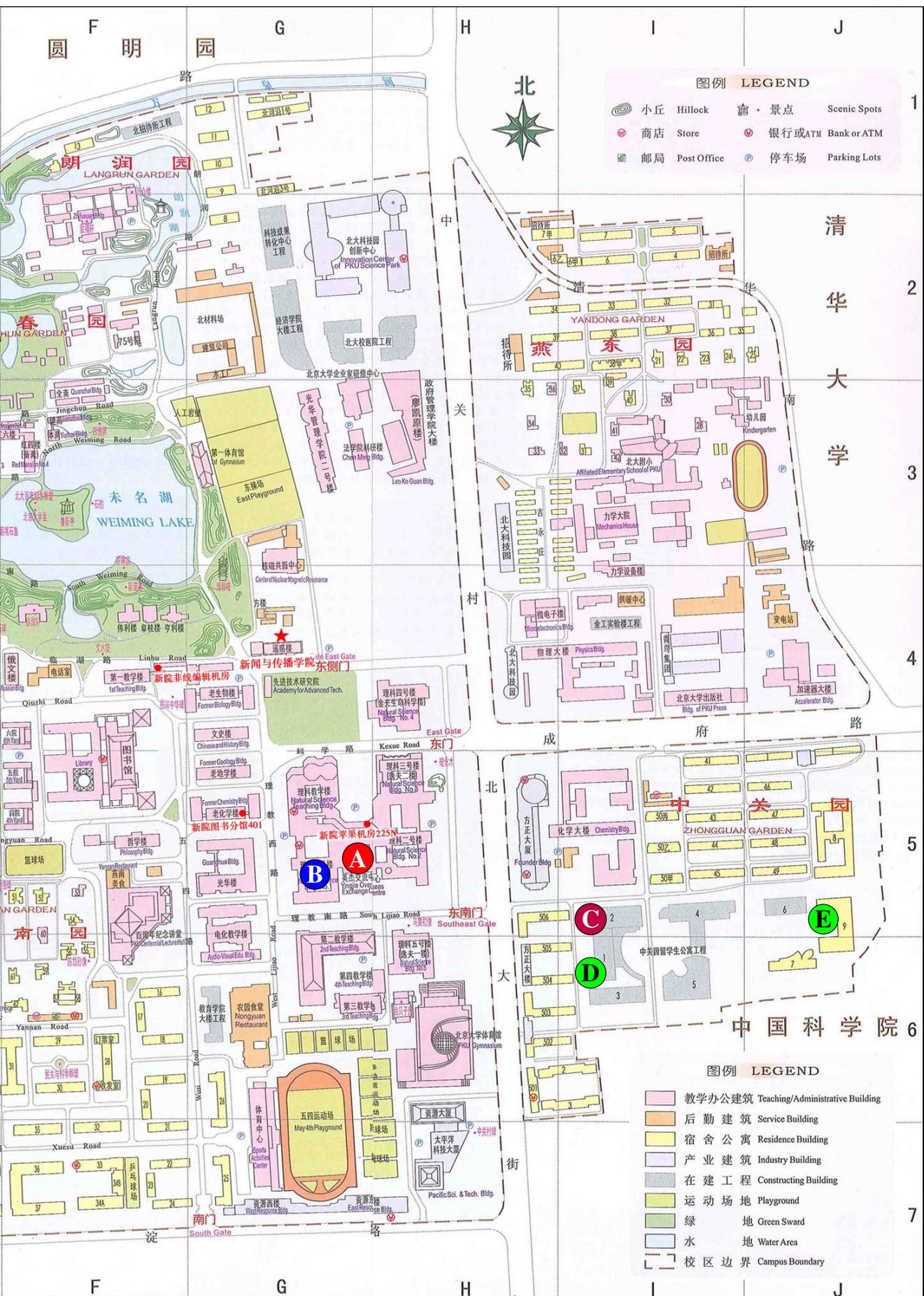
Other Tips

Free wifi connection: TBD, EDUROAM is also available.

Name tags: Name tags are required for entry to all conference events. Please wear them at all times.

Map of Peking University Campus

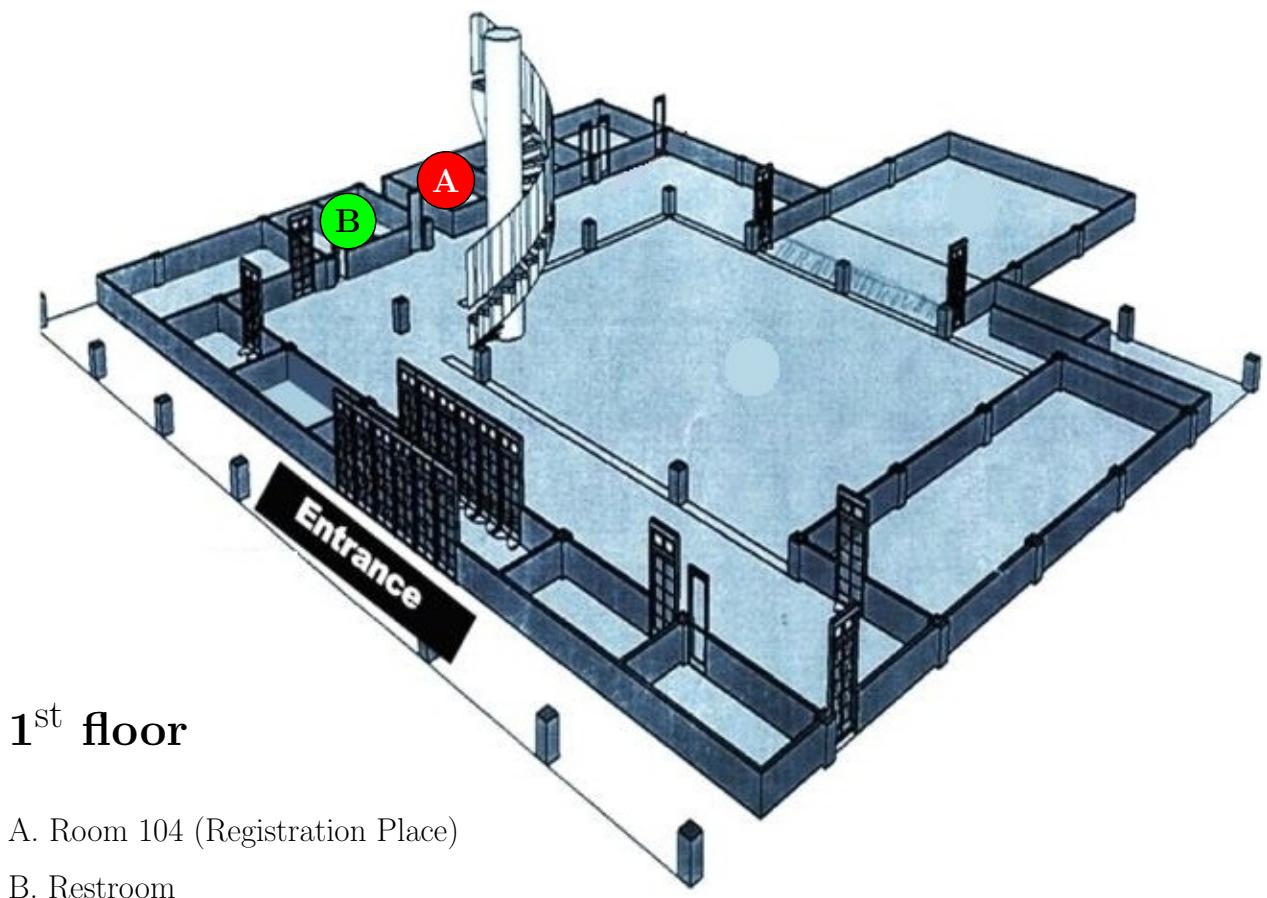
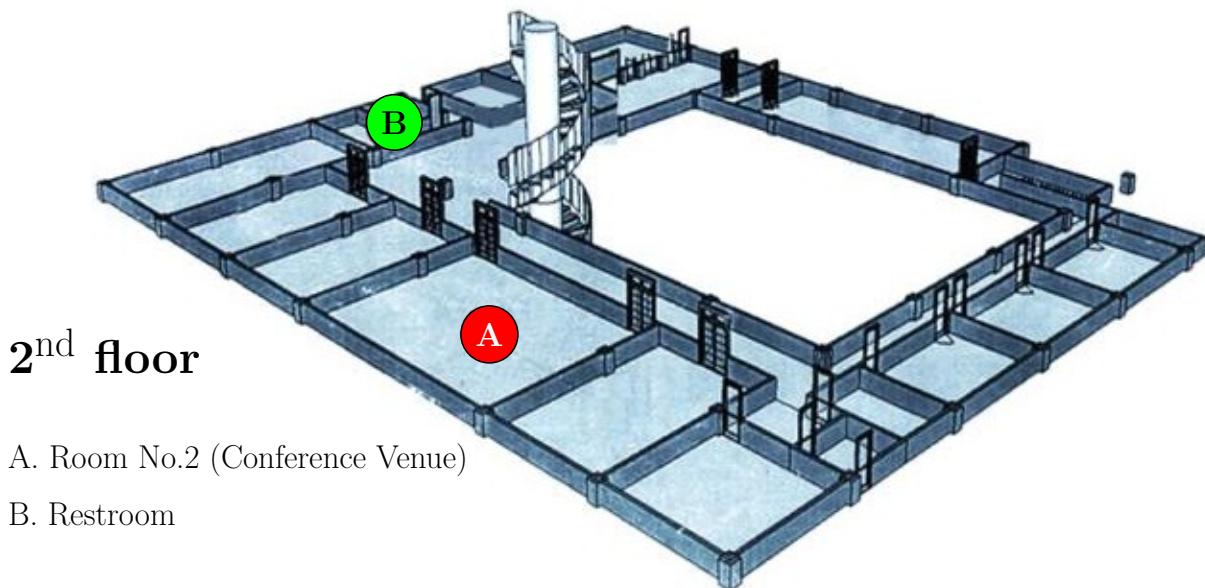




Beijing Subway Map



Floor Plan of Yingjie Exchange Center, Peking University



PROGRAM

Program Overview

	17 Oct. (Tue.)	18 Oct. (Wed.)	19 Oct. (Thu.)	20 Oct. (Fri.)
08:00 - 09:00		Registration 8:00 8:45 Opening 8:45 9:15		
09:00 - 10:00	Training Session 1 9:00 10:30 Coffee: 10:30–10:50	Keynote 1 9:15 10:10	Keynote 2 9:00 9:55 Session 6 9:55 11:00	Session 10 9:00 10:05 Session 11 10:05 11:10
10:00 - 11:00		Session 1 10:10 11:00		
11:00 - 12:00	Training Session 2 10:50 12:20 Lunch 12:20 13:15	Coffee: 11:00–11:20 Session 2 11:20 12:25	Coffee: 11:00–11:20 Session 7 11:20 12:10	Coffee: 11:10–11:30 Session 12 11:30 12:35
12:00 - 13:00		Lunch	Lunch	
13:00 - 14:00	Training Session 3 13:15 13:45 Training Session 4 13:45 14:15	12:25 14:00	12:10 14:00	12:35 14:00
14:00 - 15:00	Training Session 5I 14:15 15:30 Coffee: 15:30–15:45	Session 3 14:00 15:05	Session 8 14:00 15:05	Session 13 14:00 15:05
15:00 - 16:00	Training Session 5II 15:05 16:10 Coffee: 15:05–15:25	Session 4 15:05 16:10 Coffee: 16:10–16:30	Session 9 15:25 16:30	Session 14 15:05 16:10 Coffee: 16:10–16:30
16:00 - 17:00		Session 5 16:30 17:35	Take Bus To Yu Xian Du 16:30–17:00 Visit YXD Food Museum 17:00 18:00	Session 15 16:30 17:20 Dinner 17:20
17:00 - 18:00	Dinner 15:45 17:30	Dinner 16:30 17:35	Banquet & Award 18:00	
18:00 - 19:00	17:30	17:35	21:00	

SPH Training Day Program

Venue: Room 1338W, Level 3, #1 Science Blk, Peking University

地点: 北京大学理科一号楼三层 1338W 房间 (计算机中心 8 号机房)

Training day	17 October (Tuesday)	
9:00-10:30	Training Session 1: Theory and Application of SPH - Part 1: An Introduction to Multi-Phase Modelling in SPH	Dr. Xiangyu Hu
10:30-10:50	Coffee	
10:50-12:20	Training Session 2: Advanced SPH/CG(Coarse-Grained) modelling for biomechanics and biomedical systems	Prof. Y. T. Gu
12:20-13:15	Lunch	Box lunch
13:15-13:45	Training Session 3: Simulation with DualSPHysics	Dr. Ben Rogers
13:45-14:15	Training Session 4: Pre- and Post-Processing (Visualisation) with DualSPHysics	Dr Jose Dominguez
14:15-15:30	Training Session 5: Practical hands-on session with DualSPHysics I	Dr. Ben Rogers, Dr. Jose Dominguez,
15:30-15:45	Coffee	Dr. Jose González-Cao, Mr. Feng Zhang
15:45-17:30	Training Session 5: Practical hands-on session with DualSPHysics II	
17:30	Dinner	@PKU canteen with card

- Full day registration (8:30AM to 18:00PM) at Room 104 in the Peking University Overseas Exchange Center
 10月17日全天上午 8:30 到下午 18:00 亦在北京大学英杰交流中心 104 室注册

SPHERIC Beijing 2017 Workshop Program

Venue: Conference Room #2, Peking University Overseas Exchange Centre

地点: 北京大学英杰交流中心第二会议室

1st DAY		18 October (Wednesday)	
08:00-08:45	Registration		
08:45-09:15	Opening	Speech by: B. Rogers Speech by: J. X. Wang, Vice Dean of CoE, PKU	Chair: M. B. Liu
09:15-10:10	Keynote 1: Smoothed particle hydrodynamics, fact checking: from theory to applications by Prof. David Le Touzé, Ecole Centrale de Nantes		Chair: J. X. Wang
10:10-11:00	Session 1: Maritime and Naval Architecture Applications		Chair: A. Colagrossi
	1.1 “DualSPHysics: a numerical tool to simulate real breakwaters” <u>F. Zhang</u> ^{Student Prize} , S. P. Shang, Alejandro Crespo, José Dominguez, Moncho Gomez-Gesteira, Corrado Altomare, Andrea Marzeddu 1.2 “High speed water impacts of fat plates in different ditching configurations through a Riemann-ALE SPH model” <u>S. Marrone</u> , A. Colagrossi, M. De Leffe, L. Chiron, D. Le Touze 1.3 “Application of improved SPH solid-wall boundary model in missile water exiting” <u>H. L. Zheng</u> , H. F. Qiang, F. Z. Chen, C. Shi		
11:00-11:20	Coffee		
11:00-12:25	Session 2: Multiple Continua and Multi-Phase Flows		Chair: X. Y. Hu
	2.1 “Multiphase Godunov-typed smoothed particle hydrodynamics method with approximate Riemann solvers” <u>Z. W. Cai</u> , Z. Zong, L. Zhou, Z. Chen, C. Tiao 2.2 “A two-phase SPH model for sediment laden flows” <u>H. B. Shi</u> , X. P. Yu 2.3 “Numerical simulation of water-entry problems using an improved multiphase SPH method” <u>H. Cheng</u> ^{Student Prize} , A. M. Zhang, F. R. Ming 2.4 “Stable sharp interface method for SPH” <u>M. Y. Zhang</u>		
12:25-14:00	Lunch (Buffet lunch @ ZhongGuanYuan Global Village PKU)		
14:00-15:05	Session 3: Impacts with Fluids or Solids		Chair: X. H. Guo

	<p>3.1 “Aircraft tire water spray simulation using SPH” <u>Y. K. Hu</u>, Y. F. Rong, D. X. Leng, F. Xu, X. Y. Gao, R. G. Cao, W. Ding, J. Lv</p> <p>3.2 “Numerical simulation of the damage of multi-floor buildings by conical projectile with SPH method” H. F. Qiang, <u>X. Y. Sun</u>, F. Z. Chen, G. X. Zhang</p> <p>3.3 “Corrected smoothed particle hydrodynamics for simulating failure progress of model-scale ice” <u>X. Zheng</u>, N. B. Zhang, Q. W. Ma</p> <p>3.4 “Numerical study of the mechanism of explosive/impact welding using an improved SPH method” <u>Z. L. Zhang</u>^{Student Prize}, M. B. Liu</p>	
15:05-16:10	Session 4: Free Surface and Moving Boundaries Applications	Chair: X. F. Yang
	<p>4.1 “SPH numerical investigation of oscillating characteristics of hydraulic jumps at an abrupt drop” Diana De Padova, Michele Mossa, <u>Stefano Sibilla</u></p> <p>4.2 “An SPH simulation of bubble cavity evolution on underwater movement” <u>J. R. Shao</u>, M. B. Liu</p> <p>4.3 “The δALE-SPH model: an improved δ-SPH scheme containing particle shifting and ALE formulation” <u>P. N. Sun</u>^{Student Prize}, A. M. Zhang, A. Colagrossi, S. Marrone, M. Antuono</p> <p>4.4 “SPH numerical simulation of lift-off by impact of sand particles on flat sand bed” <u>J. Zhao</u>, A. F. Jin, Maimtimin Geni, X. J. Ma</p>	
16:10-16:30	Coffee	
16:30-17:35	Session 5: Geotechnical Applications	Chair: J. S. Wu
	<p>5.1 “A comparative study of SPH and MPM in modeling mixed-mode failure in rocks” <u>Sam Raymond</u>^{Student Prize}, Bruce Jones, John Williams</p> <p>5.2 “A SPH investigation of soil plastic behaviour with Mohr-Coulomb constitutive model” <u>S. H. Zhao</u>, Ha H. Bui, Vincent Lemiale, Giang D. Nguyen</p> <p>5.3 “A robust approach to model rock fracture with SPH” <u>Y. N. Wang</u>, Ha H. Bui, Giang D. Nguyen, P. G. Ranjith</p> <p>5.4 “An elasto-plastic-μ(I) SPH model for landslide induced debris flow” <u>W. T. Zhang</u>, Y. An, Q. Q. Liu</p>	
17:35	Dinner @PKU canteen with card	

2nd DAY		19 October (Thursday)	
09:00-09:55		Keynote 2: An implicit gradient reproducing kernel particle method: theory and applications by Prof. J. S. Chen, University of California	Chair: P. Chen, Head, Division of Computational Mechanics , PKU
09:55-11:00		Session 6: Hydraulic Applications I 6.1 “Overview of SPH-ALE applications for hydraulic turbines in ANDRITZ Hydro” Jean-Christophe Marongiu, Magdalena Neuhauser, <u>Martin Rentschler</u> , Etienne Parkinson 6.2 “Numerical and experimental investigation of two porous wave - breaking structures” W. Q. Hu, <u>Q. Fan</u> ^{Student Prize} , J. M. Zhan, W. H. Cai 6.3 “SPH for the interaction between tsunami wave and upright cylindrical groups” <u>J. J. Li</u> ^{Student Prize} , L. Tian, Y. S. Yang, L. C. Qiu, Y. Han 6.4 “Hydrodynamics characteristics of land hinged oscillating wave surge converter with SPH method” D. H. Zhang, <u>Y. X. Shi</u> , C. Huang, Y. L. Si, B. Huang, and W. Li	Chair: S. Marrone
11:00-11:20		Coffee	
11:20-12:10		Session 7: Adaptivity (variable resolution) 7.1 “The study on SPH method with space variable smoothing length and its applications to multi-phase flow” <u>W. K. Shi</u> ^{Student Prize} , Y. M. Shen , J. Q. Chen 7.2 “A dynamic refinement strategy in SPH for simulating the water entry of an elastomer” <u>L. Wang</u> , F. Xu, Y. Yang 7.3 “Adaptive particle splitting in the finite volume particle method” <u>Nathan J. Quinlan</u>	Chair: L. C. Qiu
12:10-14:00		Lunch @PKU canteen with card	
14:00-15:05		Session 8: New applications of SPH	Chair: David Le Touzé

		<p>8.1 “Modeling the melting process of quartz glass using SPH method” <u>Z. Y. Liu</u>^{Student Prize}, Q. L. Ma, H. S. Fang</p> <p>8.2 “Study on dynamic behaviors of liquid-filled flexible multibody systems under the low-gravity environment” <u>W. Z. Kong</u>, Q. Tian</p> <p>8.3 “A SPH model for the root system of plants” <u>Matthias Mimault</u>, Lionel Dupuy, Mariya Ptashnyk</p> <p>8.4 “SPH simulation of drop impact on a hot wall with vaporization effects” <u>X. F. Yang</u>, S. C. Kong, M. B. Liu</p>
15:05-15:25	Coffee	
15:25-16:30	Session 9: High-Performance Computing	Chair: B. Rogers
	<p>9.1 “Developing an extensible, portable, scalable toolkit for massively parallel incompressible smoothed particle hydrodynamics (ISPH)” <u>X. H. Guo</u>, Benedict D. Rogers, Steven Lind, Peter K. Stansby</p> <p>9.2 “Three-dimensional sloshing simulations by using GPU-based MPS method” <u>X. Chen</u>, X. Wen, D. C. Wan</p> <p>9.3 “GPU-based SPH modeling of flood with floating bodies in urban layouts including underground spaces” <u>J. S. Wu</u>, N. Li, W. Y. Liu, H. Zhang</p> <p>9.4 “Improve the effectively of computational fluid dynamics work based on supercomputing cloud” <u>N. Qiao</u></p>	
16:30-17:00	Take Bus To Yu Xian Du (YXD)	
17:00-18:00	Visit the YXD Food Museum	
18:00-21:00	Conference Banquet & Award	

3rd DAY	20 October (Friday)	
09:00-10:05	Session 10: Numerical Aspects of SPH	Chair: N. Quinlan
	10.1 "SPH energy balance during the generation and propagation of gravity waves" <u>Domenico Davide Meringolo, Y. Liu, A. Colagrossi</u> 10.2 "Water hammer analysis using SPH in density summation form" <u>D. Q. Hou, C. Y. Huang, M. L. Wang, H. F. Duan</u> 10.3 "Particle trajectory calculation in SPH" <u>J. Y. Shen, W. H. Lu, D. Q. Hou, Arris S. Tijsseling</u> 10.4 "Simulating shock waves with corrective smoothed particle method (CSPM)" <u>C. Y. Huang, J. Deng, D. Q. Hou, Arris S. Tijsseling</u>	
10:05-11:10	Session 11: Fluid Structure Interaction	Chair: M. De Leffe
	11.1 "SPH modeling of fluid-structure interaction (FSI)" <u>L. H. Han, X. Y. Hu</u> 11.2 "Numerical modeling of 2D complex movement patterns to FSI problems using smoothed particle hydrodynamics" <u>C. Zhuang, D. A. Hu, T. Long, G. Yang</u> 11.3 "Implement of the MPS-FEM coupled method for the FSI simulation of the 3-D dam-break problem" <u>Y. L. Zhang, D. C. Wan</u> 11.4 "A new numerical method for SPH fluid-solid coupling simulation and its preliminary verification" <u>X. J. Ma, Geni Mamtimin, A. F. Jin</u>	
11:10-11:30	Coffee	
11:30-12:35	Session 12: Modelling of Incompressible Flows	Chair: A. M. Zhang
	12.1 "An enhanced ISPH-SPH coupled method for incompressible fluid-elastic structure interactions" <u>Abbas Khayyer, Hitoshi Gotoh, Yuma Shimizu, Hossein Falahaty</u> 12.2 "Interaction between solitary wave and flexible plate based on MPS-FEM coupled method" <u>C. P. Rao, D. C. Wan</u> 12.3 "Modeling of single film bubble and numerical study of the plateau structure in foam system" <u>Z. G. Sun, N. Ni, Y. J. Sun, G. Xi</u> 12.4 "Numerical simulation of Rayleigh-Taylor instability by MPS multiphase method" <u>X. Wen, D. C. Wan</u>	
12:35-14:00	Lunch (Buffet lunch @ ZhongGuanYuan Global Village PKU)	

14:00-15:05	Session 13: Alternative Formulations and Particle-Based Simulation Techniques	Chair: M. B. Liu
	13.1 "Numerical simulation of particle collision and breakup behavior by SDPH-FVM coupling method" H. F. Qiang, <u>F. Z. Chen</u> 13.2 "A physics evoked meshfree method" Z. B. Ma, <u>Y. Z. Zhao</u> 13.3 "Suppression of non-physical voids in the finite volume particle method" Mohsen H. Moghimi, <u>Nathan J. Quinlan</u> 13.4 "The Hermit-type RRKPM for piezoelectric materials" <u>J. C. Ma</u> , G. F. Wei	
15:05-16:10	Session 14: Other applications of SPH	Chair: Stefano Sibilla
	14.1 "A development of a SPH model for simulation of abrasive-water-jet impacting on a metallic surface" <u>X. W. Dong</u> , Z. L. Li, J. L. Liu 14.2 "SPH simulation of Couette flow with sinusoidally moving solid boundary" <u>H. Q. Li</u> , H. T. Liu, J. Z. Chang 14.3 "Application of particle-based computational acoustics to sound propagation and scattering" <u>Y. O. Zhang</u> 14.4 "Image processing with the SPH method" <u>C. Y. Huang</u> , W. H. Lu, D. Q. Hou, X. Cheng	
16:10-16:30	Coffee	
16:30-17:20	Session 15: Hydraulic Applications II	Chair: M. Rentschler
	15.1 "Analysis of the hydrological safety of dams using numerical tools: Iber and DualSPHysics" <u>J. González-Cao</u> , O. García-Feal, A. J. C. Crespo, J. M. Domínguez, M. Gómez-Gesteira 15.2 "Construction of two-dimensional SPH numerical wave tank" <u>J. Y. Wang</u> , F. Xu, Y. Yang 15.3 "An SPH numerical wave-current tank" <u>M. He</u> , H. S. Wang, X. F. Gao, W. H. Xu, Y. Shi	
17:20	Dinner @PKU canteen with card	

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