

# **Program of 2017**

**A3 Workshop on Fluid Dynamics and  
Material Science**

**A3 Workshop on Modeling and Computation  
of Applied Inverse Problems**

**October 13-15, 2017**

**Qingdao, China**

## Content

Guides to the Conference .....	1
Block Program of CSIAM 2017.....	2
EM01 A3 Workshop on Fluid Dynamics and Materials Science .....	3
EM02 A3 Workshop on Modeling and Computation of Applied Inverse Problems .....	5
About China Society for Industrial and Applied Mathematics .....	8
Brief Introduction of the Ocean University of China.....	9
Brief Introduction of the School of Mathematical Sciences, OUC.....	10
Sketch Map of the Venue .....	11
Taxi Slip to Huanghai Hotel.....	12

## ※Guides to the Conference※

### The Usage of Badge

There will be a QR Code on your badge, which is used for identification and dining. Please show it to our volunteers when necessary.

Please keep your badge well and kindly note that you could not enter the restaurant once it is lost. In order to guarantee your personal information safe, please do not provide your badge to others for use.

### Accommodation and Dining

The venue of the conference is Huanghai Hotel (Add: No.75 Yan'an First Road, Shinan District, Qingdao 266003, China). Both accommodation and dining are at the same place.

**Time for Breakfast:** 7:00-9:30

**Place for Breakfast:** Mingyuan Restaurant (1st Floor),  
Zhonghua Restaurant (2nd Floor)

**Time and Place for Lunch and Dinner:** Attached in the block program

### WIFI

There is a wireless router in each room and you may use it for free.

The hotel WIFI is **CMCC-Huanghai**. It needs to be authorized through a local mobile phone first. As a result, please ask your Chinese colleagues or the volunteers for help when using in public area.

Since the mobile standards are not the same (GSM/CDMA/etc.) in different countries, it is not guaranteed that you could connect the WIFI with your mobile phone.

### Contact Information

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Front Dest: 61125/61126 (in-house only)  
Housekeeping: 6222 (in-house only)

***Wish you a happy time in Qingdao!***

## Block Program of CSIAM 2017

Time	Activity/Talk	Speaker
<b>12 October, 13:30-21:00</b>		
13:30-21:00	Registration (The Lobby)	
18:00-20:00	Dinner (Mingyuan Restaurant, 1st Floor)	
<b>13 October, 08:00-12:00, Ballroom, 2nd Floor of the Conference Center</b>		
08:00-09:00	CSIAM 2017 Opening Ceremony	
09:00-09:50	Invited Talk: Towards a Theoretical Foundation of PID Control	Lei GUO
09:50-10:20	Tea Break	
10:20-11:10	Invited Talk: Flow Patterns of Large Scale Appearing in Two-dimensions	Hisahi OKAMOTO
11:10-12:00	Invited Talk: Some applications of conditional nonlinear optimal perturbation to the predictability problems in weather and climate predictions	Mu MU
12:00-14:00	Lunch (Mingyuan Restaurant, 1st Floor)	
<b>13 October, 14:00-18:15</b>		
14:00-18:15	Thematic Symposia, Embedded Meetings, Forums	
18:30-20:00	Buffet Dinner (Mingyuan Restaurant, 1st Floor)	
<b>14 October, 08:00-11:50, Ballroom, 2nd Floor of the Conference Center</b>		
08:00-08:50	Invited Talk: TBA	Shige PENG
08:50-09:40	Invited Talk: Machine Learning for Medical Image Analysis	Jin Keun SEO
09:40-10:10	Tea Break	
10:10-11:00	Invited Talk: Model driven Deep Learning	Zongben XU
11:00-11:50	Invited Talk: Mathematical Analysis of the Rayleigh-Taylor Instability in Magnetohydrodynamic Flows	Song JIANG
12:00-14:00	Lunch (Mingyuan Restaurant, 1st Floor)	
<b>14 October, 14:00-18:15</b>		
14:00-18:15	Thematic Symposia, Embedded Meetings, Forums	
18:00-21:00	Dinner (Mingyuan Restaurant, 1st Floor)	
<b>15 October, 08:00-12:20</b>		
8:00-11:45	Thematic Symposia, Embedded Meetings, Forums	
11:50-12:20	Closing Ceremony (Ballroom B, 2nd Floor)	
12:20-14:00	Lunch (Yunfan Restaurant, Top Floor)	

## EM01 A3 Workshop on Fluid Dynamics and Materials Science

Organizing Committee: Pingwen Zhang (Peking University, China)  
 Yasumasa Nishiura (Tohoku University, Japan)  
 Hyeonbae Kang (Inha University, Korea)

<b>13 October, 13:50-18:00, No. 2 Meeting Room, 3rd Floor of the Conference Center</b>		
Chair	Time	Speaker & Title
Ruo Li	13:50-14:00	A3 Opening Ceremony
	14:00-14:30	Yasumasa Nishiura (Tohoku University): Interplay between Internal and External Interactions for Morphological Transitions arising in Block Copolymer Nanoparticles
	14:30-15:00	Zhennan Zhou (Peking University): An accurate front capturing scheme for tumor growth models with a free boundary limit
	15:00-15:30	Haijun Yu (Chinese Academy of Sciences): Analysis and Application of Efficient Stabilized Linear Schemes of Phase-Field Equation
	15:30-16:00	Karel Svadlenka (Kyoto University): Simulation of Interfacial Motion with Non-Constant Tensions
	16:00-16:15	Tea Break
Yasumasa Nishiura	16:15-17:00	Eunok Jung (Konkuk University): Mathematical Models and Intervention Strategies for Emerging Infectious Diseases: MERS, Ebola and 2009 A/H1N1 Influenza
	17:00-17:30	Xianmin Xu (Chinese Academy of Sciences): Onsager principle as an approximation tool for complex two-phase flow
	17:30-18:00	Yuto Miyatake (Nagoya University): Structure-preserving continuous stage Runge-Kutta methods
<b>14 October, 14:00-18:00, No. 2 Meeting Room, 3rd Floor of the Conference Center</b>		
Hisashi Okamoto	14:00-14:30	Jinhae Park (Chungnam National University): Phase Transitions of Liquid Crystals in the Landau-de Gennes theory
	14:30-15:00	Hui Zhang (Beijing Normal University): Numerical simulation for wormlike chains in two-dimensional confinement
	15:00-15:30	Sungrim Seirin-Lee (Hiroshima University): A challenging interdisciplinary approach to elucidate a mystery of remodeling process in nuclear architecture
	15:30-16:00	Hayato Chiba (Kyushu University): The Kuramoto Model on Networks

	16:00-16:15	Tea Break
Chiar	Time	Speaker & Title
Jinhae Park	16:15-17:00	Messoud Efendiyev (Helmholtz Zentrum München): Mathematical modeling of life science problems
	17:00-17:30	Tomoyuki Miyaji (Meiji University): Numerical bifurcation analysis of a car-following model with relative velocity effect
	17:30-18:00	Jonggul Lee (Konkuk University): The role of spatial heterogeneity and control measures in the spread of avian influenza epidemic 2016-2017 in Korea
<b>15 October , 08:00-11:30, No.2 Meeting Room, 3rd Floor of the Conference Center</b>		
Chiar	Time	Speaker & Title
Masao Doi	08:00-08:30	Hiroshi Kokubu (Kyoto University): A new hysteresis mechanism in hybrid dynamical systems - Toward understanding the walk-run transition in human bipedal locomotion -
	08:30-09:00	Changhoon Lee (Yonsei University): Behavior of settling/rising particles in turbulence
	09:00-09:30	Bin Dong (Peking University): "Deep Revolution" in Image Restoration and Beyond
	09:30-09:45	Tea Break
Hiroshi Kokubu	09:45-10:30	Masao Doi (Beihang University): Stability of a viscoelastic liquid bridge - Usefulness of an energetic approach
	10:30-11:00	Kaname Matsue (Kyushu University): Rigorous numerics of blow-up solutions for autonomous ODEs
	11:00-11:30	Takashi Sakajo (Kyoto University): Stability of Barotropic Vortex Strip on a Rotating Sphere

## EM02 A3 Workshop on Modeling and Computation of Applied Inverse Problems

Organizing Committee: Gang Bao (Zhejiang University, China)  
 Masahiro Yamamoto (University of Tokyo, Japan)  
 Jin Keun Seo (Yonsei University, Korea)  
 Zhi Lin (Zhejiang University, China)

13 October, 14:00-18:00, No. 1 Meeting Room, 3rd Floor of the Conference Center		
Chair	Time	Speaker & Title
Gang Bao	14:00-14:10	Opening Remark
	14:10-14:45	Dietmar Hoemberg (Weierstrass Institute for Applied Analysis and Stochastics (WIAS), Germany): Joule heating models - modeling, analysis and industrial application
	14:45-15:00	Shuai Lu (Fudan University): On parameter identification in linear stochastic differential equations by Gaussian statistics
	15:00-15:15	Guanghai Hu (Chinese Academy of Sciences): Optimal coefficient control for semilinear parabolic equations
	15:15-15:30	Wangtao Lu (Zhejiang University): A multiple level-set method for 3D inversion of magnetic data
	15:30-15:45	Lei Zhang (Zhejiang University): Numerical solution of inverse scattering problems by infinite rough surfaces with tapered wave incidence
	15:45-16:00	Haibing Wang (Southeast University): The Green function of the interior transmission problem for the diffusion equation and its applications
	16:00-16:15	Tea Break
Masahiro Yamamoto	16:15-16:30	Masahiro Yamamoto (University of Tokyo): Inverse problems for diffusion equations in industry and environmental engineering: case studies
	16:30-16:45	Takaaki Nara (The University of Tokyo): An explicit reconstruction method for MREPT
	16:45-17:00	Hiromichi Itou (Tokyo University of Science): On inverse crack problems by means of the enclosure method
	17:00-17:15	Yikan Liu (The University of Tokyo): A new unique continuation property for anisotropic elasticity systems in two dimensions

Chair	Time	Speaker & Title
Masahiro Yamamoto	17:15-17:30	Hongxiang Lin (The University of Tokyo): Photoacoustic tomography with the finite number of sensors in a two-dimensional circular geometry
	17:30-17:45	Xinchi Huang (The University of Tokyo): Inverse problems for magnetohydrodynamics system
	17:45-18:00	Hiroshi Takase and Masahiro Yamamoto (The University of Tokyo): Inverse problem related to the St. Venant equation for one dimensional water flow
<b>14 October, 14:00-18:00, No. 1 Meeting Room, 3rd Floor of the Conference Center</b>		
Chair	Time	Speaker & Title
Jin Keun Seo	14:00-14:15	Chang-Ock Lee (KAIST): Three-dimensional volume reconstruction using two-dimensional parallel slices
	14:15-14:30	June-Yub Lee (Ewha Womans University): A fast direct solver for quasi-periodic scattering problems with material junction points
	14:30-14:45	Taeuk Jeong (Yonsei University): Non-convex weighted TV model for Poissonian image restoration
	14:45-15:00	Soomin Jeon (KAIST): A CT metal artifact reduction algorithm based on sinogram surgery
	15:00-15:15	Jaemin Shin (Ewha Womans University): Energy stable methods for gradient flows using Convex Splitting Runge-Kutta methods
	15:15-15:24	Bukweon Kim (Yonsei University): Deep learning for estimation of Abdominal Circumference from Ultrasound Images
	15:24-15:33	Kang Cheol Kim (Yonsei University): Semantic segmentation for fetal biometry from Ultrasound Images
	15:33-15:42	Sungmin Lee (Yonsei University): Sinogram-consistency learning in CT for metal artifact reduction
	15:42-15:51	Hwa Pyung Kim (Yonsei University): Deep learning for undersampled MRI reconstruction
	15:51-16:00	Ariungerel Jargal (Yonsei University): EIT-based abdominal obesity estimation using deep learning
	16:00-16:15	Tea Break



Chair	Time	Speaker & Title
Jin Cheng	16:15-16:35	Xiaodong Liu (Chinese Academy of Sciences): From limited-aperture to full-aperture
	16:35-16:55	Min Zhong (Southeast University): On the reconstruction of media inhomogeneity by inverse wave scattering model
	16:55-17:15	Xiang Xu (Zhejiang University): On inverse problems for piezoelectric equation: stability analysis and numerical method
	17:15-17:35	Jun Lai (Zhejiang University): A fast direct imaging method for the inverse obstacle scattering problem with nonlinear point scatterers
	17:35-18:15	Discussion

The abstracts of the talks can be downloaded at [电子摘要下载地址](#).

## About China Society for Industrial and Applied Mathematics

Founded in 1990, China Society for Industrial and Applied Mathematics (CSIAM) is a non-governmental academic organization for Chinese applied mathematicians.

CSIAM aims to bridge mathematics and the industrial and business communities, to promote cooperation between mathematicians and engineers, technicians along with corporate leaders, as well as to solve various mathematical problems hindering economic and technological development, and to further the research and education in applied mathematics. The current president of CSIAM is Pingwen Zhang. The former presidents are Shutie Xiao, Qingcun Zeng, Tatsien Li and Lei Guo.

Up to now, there are 16 regional societies for Industrial and Applied Mathematics across China. Each society carries out academic activities independently, leading the industrial and applied mathematics research in that region. The working organizations of CSIAM are Advisory Committee, Organizing Committee, Development Foundation Committee, Academic Committee, Finance Committee, Publicity Committee, Education Committee, Prize Committee, Youth Committee, Science Popularization Committee, International Exchange Committee, Mathematical Modeling Contest Committee, Publication Committee, Enterprise Cooperation and Industrial Applications Committee, Activity Group Management and Societies Liaison Committee, Committee for Women in Applied Mathematics, and CSIAM Office.

The Activity Groups of CSIAM include Complex Networks and Complex Systems, Geometric Design and Computing, Climate and Environment Mathematics, Mathematical Modeling, Graph Theory and Combinatorics with Applications, Sports Mathematics, Mathematical System and Control, Numerical Methods for Petroleum and Groundwater Resources, Medicine Mathematics and Mathematical Life Science.

CSIAM has five academic journals, namely, *Applied Mathematics - A Journal of Chinese Universities*, *Chinese Journal of Engineering Mathematics*, *Mathematical Modeling and Its Applications*, *Journal of Mathematical Research with Applications*, and *Annals of Applied Mathematics*.

CSIAM awards three prizes, the CSIAM Su Buchin Prize, the CSIAM Xiao Shutie Prize, and the CSIAM Young Scholar Prize.

As a large member of the International Council for Industrial and Applied Mathematics (ICIAM), CSIAM actively supports and participates in the world-wide activities of industrial and applied mathematics. In 2015, the 8th International Congress on Industrial and Applied Mathematics hosted by CSIAM was successfully held in Beijing. Yuanhao Li, The Vice-President of China, attended the congress opening ceremony, giving a speech, and awarding the five ICIAM Prize winners. Over 3400 attendees from 68 countries participated in the conference, while more than 3000 academic talks were given. The numbers of both talks and participants hit a record high.

With the support from the Ministry of Education of the P.R.C, CSIAM has held China Undergraduate Mathematical Contest in Modeling annually Since 1992. This contest

provides a good opportunity for students to develop creative thinking, problem-solving abilities as well as team-work spirit.

CSIAM is always ready to joint efforts with mathematicians in the world arena for a brilliant future of industrial and applied mathematics.

## **Brief Introduction of the Ocean University of China**

Ocean University of China (OUC) is a comprehensive university with particular strengths in oceanography and fisheries science. OUC offers courses in Science, Engineering, Agronomy (Fisheries), Pharmaceutics, Economics, Management, Liberal Arts, Law, Education, History, and Art. OUC has been approved as one of the national key universities included in the list of “Project 985” (for China’s top 40 universities) and “Project 211” (for China’s top 100 universities). OUC is one of the first universities approved to confer PhD degrees, Master’s degrees and Bachelor’s degrees by the State Academic Degree Committee. OUC has four campuses: Yushan Campus、 Fushan Campus 、 Laoshan Campus and Huangdao Campus. The motto of OUC is “Ocean Embraces All Streams; Exploring Promises Reaching Far.”

OUC is the cradle of China’s marine professionals, and it has graduated a large number of competent specialists in marine science for China. 70 percent of Ph.D. holders in oceanography and fisheries in China graduated from OUC. The first scientist to reach the South Pole, the first Chinese scientist to investigate the South Pole on foot and the first Chinese scientist to reach both the North and South Poles all graduated from OUC. 68 percent of the winners of National Foundation Awards for Distinguished Young Researchers in oceanography and 46 percent of the winners of National Foundation Awards for Distinguished Young Researchers in fisheries graduated from OUC.

OUC is recognized as the driving force of China’s marine research and application. OUC boasts a number of research institutions at national level, including National Laboratory for Marine Science and Technology, Qingdao, China (under construction), Research Center for Marine Development of China, National Research Center for Marine Pharmaceutical Engineering Technology, etc. According to the ESI database, OUC has reached the top 1% of the most-cited universities and scientific institutions in nine research fields including plant & animal science, earth science, engineering, chemistry, agricultural sciences, materials science, biology and biochemistry, environment/ecology, and pharmacology/toxicology.

OUC adheres to the open education, and is implementing international strategy. So far, the university has established cooperative relations with over 240 institutions of higher learning and research institutes in more than 37 countries and regions. In 2005, the International Association of Marine-related Institutions (IAMRI) was

proposed and founded at OUC. New members and expanded cooperation programs are continuously added to the list. In 2005, OUC joined in “Sino-US 10+10”, a joint program between 10 excellent universities in China and 10 prestigious universities in the UC system (University of California in the U.S.) In 2008, the Confucius Institute in Texas was jointly established by OUC and Texas A&M University. In addition, OUC has also established Center for Sino-Germany Cooperation in Marine Sciences, Sino-Australian Joint Research Centre for Coastal Management, Sino-Korean Research Center for Marine Development, OUC-WHOI International Joint Research Centre, OUC-Auburn University Joint Research Centre for Aquiculture and Environment Engineering, etc. Currently, OUC has built cooperation with ASEAN Fisheries Education Network as a new member of ASWEAN-FEN+.

The 21st century is an ocean-focused century. The developmental goal of OUC is to build a high-level university with international visibility, so as to lay an initial foundation for a research-oriented university as OUC approaches its 100th anniversary. By 2025, OUC will be further developed into a top-level comprehensive research university with strong emphasis in marine sciences. By the middle of this century (or maybe longer), OUC will vigorously press ahead with reform and innovation, while implementing a strategy to make China strong by further developing the ocean, in order to become a world-class university with distinct characteristics by achieving a rapid and sustainable development.

## **Brief Introduction of the School of Mathematical Sciences, OUC**

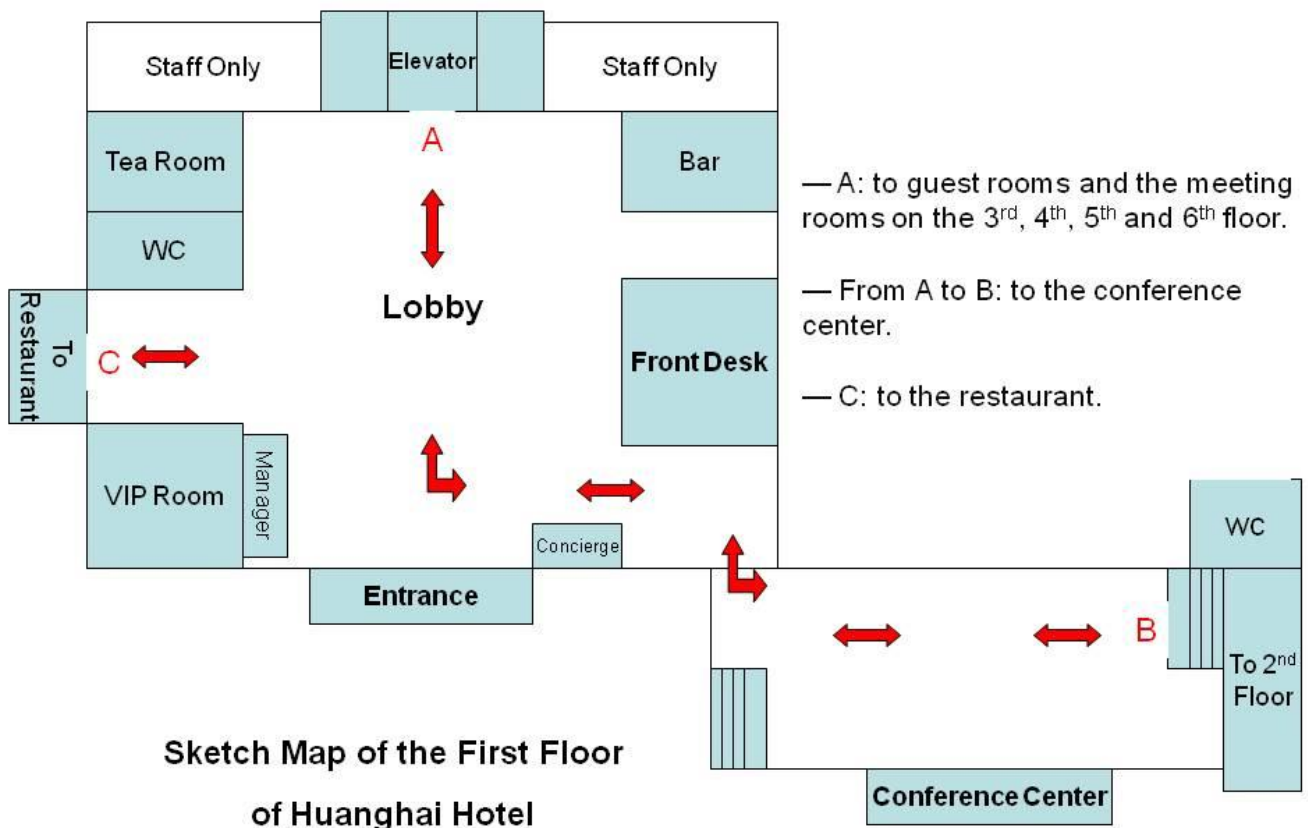
The School of Mathematical Sciences (SMS) is dedicated to providing high quality mathematical education to students and to promote first-class research in pure and applied mathematics. We have 74 regular faculty members consisting of 18 full professors (7 of them are doctoral supervisors), 27 associate professors and 4 research professor appointed under the University’s Green Card Elite Scholar Program. Currently, over 500 undergraduate students and over 120 graduate students are enrolled in the School.

The School is composed of the Department of Mathematics (including Applied Mathematics) and the Department of Information and Computational Sciences. Undergraduate degrees in either discipline, which are featured undergraduate majors of Shandong Province, are offered. We also offer Master’s degrees in Pure Mathematics, Computational Mathematics, Applied Mathematics, Operational Research and Control theories, Probability Theory and Mathematical Statistics, and Statistics. One inter-disciplinary Doctoral degree program in Ocean Mathematical Technology is also offered. Applied Mathematics and Computational Mathematics are key subjects of Shandong Province.

The School explores the connections between mathematics and its applications at both educational and research levels. The field of research includes, but is not limited to, theory, algorithms and applications in scientific computations, differential equations and optimizations, pure mathematics, and statistics. Some research groups conduct both inter-disciplinary and inter-departmental scientific researches. The research project, mathematical marine technology, which focuses on applications of mathematics in marine sciences, is an exemplary example. Over the years, our research groups have made strong scientific impact in the area of differential equations, numerical methods, analysis and topology, combinatorial optimization and other related fields.

In recent years, the School has been awarded with over 50 research projects at the national, provincial and ministerial level. Annually, over 100 research papers are published in national and international journals with high impact factor.

### Sketch Map of the Venue



## Taxi Slip to Huanghai Hotel

(Please show this paper to a taxi driver when necessary.)

请送我去黄海饭店。

(Please take me to Huanghai Hotel.)

黄海饭店

地址：市南区延安一路 75 号

电话：8287 0215



黄海饭店  
Huanghai Hotel



黄金品质 海深情怀  
Golden quality. Marine feeling.

紧急联络人：

张洁 (手机：13581728977)

(Please call Ms. Jie Zhang at  
13581728977 for assistance.)