Week 2 (Sep.18-Sep.22)

Topic: Incompressible Navier-Stokes Equations

Workshop Room: Room 2201, Guanghua East Building, Fudan University

Lecture Series Speakers: Hideo Kozono (Waseda University)

Invited Speakers: Guilong Gui (Northwest University)
Bin Han (Hangzhou Dianzi University)
Ning Jiang (Wuhan University)
Qi Zhang (University of California Riverside)
Zhifei Zhang(Peking University)

Organizing Committee:
Peter Constantin (Princeton University)
Yoshikazu Giga (University of Tokyo)
Hao Jia (University of Chicago)
Carlos Kenig (University of Chicago)
Zhen Lei (Fudan University)
Fanghua Lin (Courant Institute of Mathematical Sciences)
Gregory Seregin (University of Oxford)
Vladimir Sverak (University of Minnesota)
Edriss Titi (Texas A & M University)
Sijue Wu (University of Michigan)

For further information, please contact

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Schedule

2017 Fall Program on Analysis of PDE (Sept. 11 – Dec. 2, 2017)

Week 2 (Sept.18-Sept.22)	
Topic: Incompressible Navier-Stokes Equations	
Monday (September 18) Room 2201, Guanghua East Building, Fudan University	
Morning Session	
9:30 – 9:35	Chair：Fanghua Lin
9:35 – 10:25	Hideo Kozono (Lecture 1)
10:25 – 10:45	Tea Break
10:45 – 10:50	Chair：Hideo Kozono
10:50 – 11:40	Jiang Ning
Lunch Break	
Afternoon Session	
14:30 – 14:35	Chair: -
14:35 – 15:25	Free
15:25 – 15:45	Tea Break
15:45 – 15:50	Chair：-
15:50 – 16:40	Free
Tuesday (September 19) Room 2201, Guanghua East Building, Fudan University	
Morning Session	
9:30 – 9:35	Chair：Fanghua Lin
9:35 – 10:25	Hideo Kozono (Lecture 2)
10:25 – 10:45	Tea Break
10:45 – 10:50	Chair：Jiang Ning
10:50 – 11:40	Zhang Qi
Lunch Break	

Afternoon Session	
14:30 – 14:35	Chair: -
14:35 – 15:25	Free
15:25 – 15:45	Tea Break
Group Photo	**15:45 – 16:00**
16:00 – 16:05	Chair：-
16:05 – 16:55	Free

Wednesday (September 20)	**Room 2201, Guanghua East Building, Fudan University**
Morning Session	
9:30 – 9:35	Chair：Fanghua Lin
9:35 – 10:25	Hideo Kozono (Lecture 3)
10:25 – 10:45	Tea Break
10:45 – 10:50	Chair：Zhang Qi
10:50 – 11:40	Zhang Zhifei
Lunch Break	
Afternoon Session	
14:30 – 14:35	Chair：-
14:35 – 15:25	Free
15:25 – 15:45	Tea Break
15:45 – 15:50	Chair：-
15:50 – 16:40	Free

Thursday　(September 21)	**Room 2201, Guanghua East Building, Fudan University**
Morning Session	
9:30 – 9:35	Chair：Fanghua Lin
9:35 – 10:25	Hideo Kozono (Lecture 4)
10:25 – 10:45	Tea Break
10:45 – 10:50	Chair：Zhang Zhifei
10:50 – 11:40	Guilong Gui
Lunch Break	

Afternoon Session	
14:30 – 14:35	Chair: Guilong Gui
14:35 – 15:25	Shangkun Weng
15:25 – 15:45	Tea Break
15:45 – 15:50	Chair：-
15:50 – 16:40	Free

Friday   (September 22)   Room 2201, Guanghua East Building, Fudan University

Morning Session	
9:30 – 9:35	Chair：Fanghua Lin
9:35 – 10:25	Hideo Kozono (Lecture 5)
10:25 – 10:45	Tea Break
10:45 – 10:50	Chair：Lei Zhen
10:50 – 11:40	Han Bin

Lunch Break

Afternoon Session	
14:30 – 14:35	Chair: -
14:35 – 15:25	Free
15:25 – 15:45	Tea Break
15:45 – 15:50	Chair：-
15:50 – 16:40	Free

2017 Fall Program on Analysis of PDE

Week 2 (Sep.18-Sep.22)

Topic: Incompressible Navier-Stokes Equations

Titles and Abstracts:

Speaker: Guilong Gui
TBA

Speaker: Bin Han

Title: Sharp one component regularity for Navier-Stokes

Abstract: We consider the conditional regularity of mild solution v to the incompressible Navier-Stokes equations in three dimensions. Let $e \in \mathbb{S}^2$ and $0 < T^\ast < \infty$. J. Chemin and P. Zhang (Ann. Sci. \'{E}c. Norm. Sup\'{e}r, 2016) proved the regularity of v on $(0,T^\ast]$ if there exists $p \in (4, 6)$ such that $$\int_0^{T^\ast}\|v\cdot e\|^p_{\dot{H}^{\frac{1}{2}+\frac{2}{p}}}dt < \infty.$$ J. Chemin, P. Zhang and Z. F. Zhang (Arch. Ration. Mech. Ana. ,2017) extended the range of p to $(4, \infty)$. In this article we settle the case $p \in [2, 4]$. Our proof also works for the case $p \in (4,\infty)$.

Speaker: Ning Jiang

TBA

Speaker: Hideo Kozono
Title: Method of the Besov space and its applications to the strong solutions of the Navier-Stokes equations
Abstract: We first introduce several basic notions of the Besov spaces such as paraproduct formula and the chain rule. The bilinear estimates related to the nonlinear structure on the Navier-Stokes equations and the L^p-L^q-type estimates of the Stokes semigroup are established. Then the problem on existence, uniqueness and regularity of the stationary Navier-Stokes equtions is discussed in the scaling invariant homogeneous Besov space. In particular, a self-similar solution is constructed. As for the non-stationary case, we prove a maximal regularity theorem of the Stokes equations in the homogeneous Besov space. Finally,

local and global well-posedness in the critical Besov space is fully investigated for the Cauchy problem with the external forces of the non-stationary Navier-Stokes equations.

This series of lectures is based on the joint work with Prof. Senjo Shimizu at Kyoto University.

Speaker: Shangkun Weng
Title: On the decay properties of steady axisymmetric Navier-Stokes
Abstract: TBA

Speaker: Qi Zhang
Title：Regularity of Weak Solutions of Elliptic and Parabolic Equations with Some Critical or Supercritical Potentials
Abstract： We prove Holder continuity or differentiability of weak solutions of uniformly elliptic and parabolic equations with power like potentials which scales critically or super-critically. This is a joint work with Li Zijin.

Speaker: Zhifei Zhang
TBA

Participants:

Dongfen Bian (Beijing Institute of Technology)

Guilong Gui (Northwest University)

Bin Han (Hangzhou Dianzi University)

Bobo Hua (Fudan University)

Ning Jiang (Wuhan University)

Hideo Kozono (Waseda University)

Zhen Lei (Fudan University)

Hui Li (Peking University)

Jingyue Li (China Academy of Engineering Physics)

Fanghua Lin (Courant Institute)

Xiang Luo (University of Science and Technology of China)

Yao Nie (Beihang University)

Peng Qu (Fudan University)

Jiawei Sun (Capital Normal University)

Houzhi Tang (Capital Normal University)

Shangkun Weng (Wuhan University)

Hao Wu (Fudan University)

Qi Zhang (University of California, Riverside)

Zhifei Zhang (Peking University)

Qidi Zhang (Chinese Academy of Sciences)

Yi Zhou (Fudan University)