Vietnam National University Ho Chi Minh City University of Science

Faculty of Mathematics and Computer Science

Mathematical Conference

Summer Meeting 2018

Thursday July 12 and Friday July 13, 2018

Vietnam National University Ho Chi Minh City University of Science
Faculty of Mathematics and Computer Science
227 Nguyễn Văn Cừ, District 5, Ho Chi Minh City, Vietnam

Mathematical Conference

Summer Meeting 2018

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Speakers

- H.T. Banks (North Carolina State University, USA)
  Population models-The Prohorov metric framework and aggregate data inverse problems
- Nhan-Phu Chung (Chung Nhân Phú) (Sungkyunkwan University, Korea)
  Rigidity of group actions and geometric group theory
- Đặng Đức Trọng (VNU-HCM University of Science)
  Thirty years of inverse problems in Ho Chi Minh City
- Nam Q. Le (Lê Quang Nẫm) (Indiana University, USA)
  The Brunn-Minkowski inequality for the Monge-Ampere eigenvalue and boundary regularity of the eigenfunctions
- Trieu Le (Lê Long Triều) (University of Toledo, USA)
  Characterizations of inner functions on the unit disk
- Hoai-Minh Nguyen (Nguyễn Hoài Minh) (École polytechnique fédérale de Lausanne, Switzerland)
  Cloaking via transformation optics: cloaking, non-cloaking, and infinite energy
- Truyen Nguyen (Nguyễn Văn Truyền) (University of Akron, USA)
  An optimal control problem and Fokker-Planck-Kolmogorov equations
- Jinhae Park (Chungnam National University, Korea)
  Minimizers of the Landau-de Gennes energy functional in interfaces
- Tuoc Phan (Phan Văn Tuộc) (University of Tennessee, USA)
  Mixed-norm estimates for non-stationary Stokes systems with singular coefficients and applications

Program committee: Huỳnh Quang Vũ (VNU-HCM University of Science, Vietnam), Nguyễn Tiến Khải (North Carolina State University, USA), Trần Vĩnh Hưng (University of Wisconsin-Madison, USA)

Local organizing committee: Ông Thanh Hải, Võ Đức Cẩm Hải (VNU-HCM University of Science, Vietnam)

Summer courses

- Lizhen Lin (University of Notre Dame, USA): **Bayesian methods for machine learning**. July 5-6 2018.
- Hien Tran (North Carolina State University, USA): **An Introduction to the mathematics of machine learning**. July 16-18 2018.
- Trần Vĩnh Hưng (University of Wisconsin Madison, USA): **Level set method and mean curvature flow equation**. July 16-19 2018.

Everybody is welcomed. There is no registration fee. For further information: http://www.math.hcmus.edu.vn/summer_meeting

Mathematical Conference
Summer Meeting 2018

VNU-HCM University of Science, Ho Chi Minh City, July 12 – 13 2018

"Summer Meeting" is an annual mathematical meeting since 2008 organized primarily by alumni of the Faculty of Mathematics and Computer Science of the University of Science (Vietnam National University Ho Chi Minh City) who are doing mathematics abroad, held during the summer breaks.

List of speakers

- H.T. Banks (North Carolina State University, USA)
- Nhan-Phu Chung (Sungkyunkwan University, Korea)
- Dang Duc Trong (VNU-HCM University of Science, Vietnam)
- Nam Q. Le (Indiana University, USA)
- Trieu Le (University of Toledo, USA)
- Hoai-Minh Nguyen (École Polytechnique Fédèrale de Lausanne, Switzerland)
- Truyen Nguyen (University of Akron, USA)
- Jinhae Park (Chungnam National University, Korea)
- Tuoc Phan (University of Tennessee, USA)

Organizers

Program committee: Huynh Quang Vu (VNU-HCM University of Science, Vietnam), Nguyen Tien Khai (North Carolina State University, USA), Tran Vinh Hung (Univeristy of Wisconsin-Madison, USA)

Local organizing committee: Ong Thanh Hai and Vo Duc Cam Hai (VNU-HCM University of Science, Vietnam)

Supported by

VNU-HCM University of Science, Faculty of Mathematics and Computer Science, and The Summer Mathematical Meeting Fund

Venue and Contacts

University of Science, 227 Nguyen Van Cu, District 5, Ho Chi Minh City, Lecture Hall Building I
Web: http://www.math.hcmus.edu.vn/summer_meeting

Program

Thursday, 12/7/2018

Morning

7:30-8:00 Registration

8:00-8:20 Opening remarks

8:20-9:10 H.T. Banks, *Population Models-The Prohorov Metric Framework and Aggregate Data Inverse Problems*

9:20-10:10 Hoai-Minh Nguyen, *Cloaking via transformation optics: cloaking, non-cloaking, and infinite energy*

10:10-10:40 Coffee break

10:40-11:30 Jinhae Park, *Minimizers of the Landau-de Gennes energy functional in Interfaces*

Afternoon

14:00-14:50 Nam Q. Le, *The Brunn-Minkowski inequality for the Monge-Ampere eigenvalue and boundary regularity of the eigenfunctions*

15:00-15:50 Tuoc Phan, *Mixed-norm estimates for non-stationary Stokes systems with singular coefficients and applications*

15:50-16:20 Coffee break

16:20-17:10 Truyen Nguyen, *An optimal control problem and Fokker-Planck-Kolmogorov equations*

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Friday, 13/7/2018

Morning

8:20-9:10 Dang Duc Trong, *Thirty years of inverse problems in Ho Chi Minh City*

9:20-10:10 Trieu Le, *Characterizations of inner functions on the unit disk*

10:10-10:40 Coffee break

10:40-11:30 Nhan-Phu Chung, *Rigidity of group actions and geometric group theory*

Abstracts

H.T. Banks: Population Models-The Prohorov Metric Framework and Aggregate Data Inverse Problems

We consider nonparametric estimation of probability measures for parameters in problems where only aggregate (population level) data are available. We summarize an existing computational method for the estimation problem which has been developed over the past several decades. Theoretical results are presented which establish the existence and consistency of very general (ordinary, generalized and other) least squares estimates and estimators for the measure estimation problem.

Phu Chung: Rigidity of group actions and geometric group theory

In this talk, we present certain rigidity results for group actions via geometric group theory. We will prove a topological version of Popa's measurable cocycle superrigidity theorem for full shifts. In the first part, we provide a new characterization of one end groups via continuous cocycle superrigidity of their full shifts. As a consequence, we have an application in continuous orbit equivalence rigidity. In the second part, we show that every Holder continuous cocycle for the full shifts of every finitely generated group G that has one end, undistorted elements and sub-exponential divergence function is rigidity. This is joint work with Yongle Jiang.

Dang Duc Trong: Thirty years of inverse problems in Ho Chi Minh City

The study of inverse problems in Ho Chi Minh City was founded by Professor Dang Dinh Ang. He studied the problems in geophysic, fracture mechanics, heat conduction, interpolation in complex analysis, free boundary problems... The report will review some inverse problems studied in Ho Chi Minh City in the last thirty years.

Nam Q. Le: The Brunn-Minkowski inequality for the Monge-Ampere eigenvalue and boundary regularity of the eigenfunctions

In 1976, Brascamp and Lieb proved a Brunn-Minkowski inequality for the first eigenvalue of the Laplacian. In this talk, I will discuss the proof of a nonlinear analogue of the above result, that is, the Brunn-Minkowski inequality for the eigenvalue of the Monge-Ampere operator. For this purpose, I will first introduce the Monge-Ampere eigenvalue problem on general bounded convex domains. Then, I will present several properties of the eigenvalues and related analysis concerning boundary regularity of the eigenfunctions.

Trieu Le: Characterizations of inner functions on the unit disk

An inner function is a bounded holomorphic function on the unit disk whose values have modulus one almost everywhere on the unit circle. An important result of A. Beurling in 1949 showed that all closed invariant subspaces of the unilateral forward shift on the Hardy-Hilbert space are described using inner functions. Since then, inner functions play a central role in function theory and operator theory. Recent works of Bénéteau et al. and of Seco study inner functions in the more general setting of weighted Hardy spaces. Motivated by their results, we shall discuss several new characterizations of such inner functions.

Hoai-Minh Nguyen: Cloaking via transformation optics: cloaking, non-cloaking, and infinite energy

This talk is on cloaking via transformation optics for acoustic and electromagnetic waves in the time harmonic regime. This cloaking technique is based on the invariance of the Helmholtz and Maxwell equations under a change of variables. Using a transformation which blows up a point into a cloaked region, one can then make the cloaked region undetected by (and hence cloaked from) observers away from cloaked region. The singular nature of cloaks coming from this kind of transformations presents various difficulties in practice as well as in theory. First the cloaking device is hard to fabricate and more importantly it is not clear that the cloaking effect is achieved since the invariance of the equations might be not valid for singular transformations. To rigorously understand the cloaking phenomena, one uses approximate cloaking schemes blowing up a small ball into the cloaked region and study what happens when the ball tends to a point. In this talk, I will discuss the scenarios of cloaking, non-cloaking, and infinite energy via approximate cloaking approach.

Jinhae Park: Minimizers of the Landau-de Gennes energy functional in Interfaces

In this talk, I will briefly introduce Landau-de Gennes theory of Liquid crystals which is a generalization of the classical Oseen-Frank energy. Liquid crystal is a state of matter between crystalline solid and fluid. Molecule liquid crystals possesses properties of solid and fluid which give rise to complex structures to be analyzed. One of the most interesting problems is to investigate behaviors of molecules between two different phases. We will discuss profiles of minimizers in the Isotropic-Nematic interface with several different anchoring conditions.

Truyen Nguyen: An optimal control problem and Fokker-Planck-Kolmogorov equations

We consider an optimal control problem with the cost functional being given in terms of the probability laws of controlled Markov processes. We show that the associated value function satisfies the Bellman's principle of optimality and solves a first-order Hamilton-Jacobi-Bellman equation in the Wasserstein space. In order to obtain some regularity estimates for the value function, we also investigate the stability of weak solutions to the parabolic Fokker-Planck-Kolmogorov equations with rough drifts and variable diffusion coefficients.

Tuoc Phan: Mixed-norm estimates for non-stationary Stokes systems with singular coefficients and applications

In this talk, we consider time-dependent Stokes systems in both divergence and non-divergence forms with unbounded measurable coefficients. Regularity estimates in mixed norm Sobolev spaces for solutions are established assuming that the coefficients have small mean oscillations with respect to the spatial variable in small cylinders. As a special case, our results imply Caccioppoli's type estimates for the Stokes systems with variable coefficients. A new epsilon-regularity criterion for Leray-Hopf weak solutions of Navier-Stokes equations is also obtained as a consequence of our regularity results. Our epsilon-regularity criterion in turn implies some borderline cases of the well-known Serrin's regularity criterion. The talk is based on the joint work with H. Dong (Brown University).

List of registered participants

The list is ordered by time of registration

F: university faculty *P: PhD student* *M: master student*
S: undergraduate student

	Tên - Name:	Nơi làm việc - Institution:	Công việc hiện tại - Occupation
1	Tuoc Phan	University of Tennessee	F
2	Trần Anh Tú	HCMUS	S
3	Thieu Thi Kim Thoa	Gran Sasso Science Institute, L'Aquila, Italy	P
4	Nguyễn Đăng Khoa	University of Vienna	P
5	Nguyễn Minh Quân	Trường Đại học quốc tế, ĐHQG-HCM	F
6	Nguyễn Tuấn Anh	Ho Chi Minh City University of Technology	F
7	Huỳnh Văn Y	HCMUS	S
8	Phạm Duy Nguyên	Trường THPT An Dương Vương	teacher
9	Đoàn Nhật Minh	University of Luxembourg	P
10	Đoàn Lê Trung Hậu	HCMUS	S
11	Phạm Trương Hoàng Nhân	HCMUS	S
12	Lê Thị Kim Hương	Gia sư tại nhà (TP.HCM)	M
13	Nguyễn Tiến Đạt	Université Paris-Sud, Orsay, France.	M
14	Phan Ngọc Yến	Đại học Sư Phạm Tp. Hồ Chí Minh	M
15	Nguyễn Thanh Hiếu	HCMUS	S
16	Đặng Trường	DFM Engineering	CFD developer
17	Nguyễn Nhựt Hưng	HCMUS	M
18	Võ Thành Huấn	HCMUS	S
19	Nguyễn Đăng Khải Hoàn	HCMUS	S
20	Nguyễn Phương Đông Hà	HCMUS	S
21	Lê Công Bình	Thpt Dương Văn Dương	teacher
22	Nguyễn Ngọc Dung	HCMUS	M
23	Nguyễn Trung Tín	HCMUS	M
24	Trần Khải An	HCMUS	S
25	LÊ ĐỨC HOÀNG	THCS PHAN CHU TRINH ĐỒNG NAI	teacher
26	Lương Anh Nhật	HCMUS	S
27	Tạ Quang Tuấn	HCMUS	S
28	Đặng Trọng Bảo Anh	University of Louisiana at Lafayette, USA	P
29	Lữ Quốc Hưng	University of Toulouse III - Paul Sabatier	M
30	Trần Trịnh Mạnh Dũng	HCMUS	M
31	Lê Minh Trí	HCMUS	S
32	Phùng Ngọc Thi		S
33	Nguyễn Quản Bá Hồng	HCMUS	S
34	Trần Trịnh Mạnh Dũng	HCMUS	M
35	VŨ ĐỖ HUY CƯỜNG	HCMUS	F
36	Nguyen Quang Huy	Dai hoc Su pham Ky thuat TpHCM	F
37	Nghĩa	HCMUS	S
38	Nguyễn Minh Huy	HCMUS	S
39	Lương Thanh Quỳnh		M
40	Nguyễn Thị Thu Thành		M
41	Lý Hoàng Thiên	HCMUS	S
42	Nguyễn Thị Thu Duyên	HCMUS	S

43	Nguyễn Minh Luân Vũ	THPT Nguyễn Văn Cừ	teacher
44	Vũ Hùng	HCMUS	S
45	Võ Lam Phương	HCMUS	S
46	Huỳnh Quang Dự	HCMUS	S
47	Nguyễn Trung Nghĩa	HCMUS	S
48	Đỗ Tấn Thi	TMA	S
49	Phan Đức Duy	Tampere Univerisity of Technology, Finland	Postdoctoral researcher
50	Phạm Ngô Thành Đạt	HCMUS	S
51	Nguyễn Võ Lan Thảo	HCMUS	S
52	H.T. Banks	North Carolina State University	F
53	Nhan-Phu Chung	Sungkyunkwan University	F
54	Đặng Đức Trọng	HCMUS	F
55	Nam Q. Le	Indiana University	F
56	Trieu Le	University of Toledo	F
57	Hoai-Minh Nguyen	École polytechnique fédérale de Lausanne	F
58	Truyen Nguyen	University of Akron	F
59	Jinhae Park	Chungnam National University	F
60	Huỳnh Quang Vũ	HCMUS	F
61	Trần Thị Hạnh	ĐH Sư Phạm Kỹ Thuật Tp.Hồ Chí Minh	F
62	Tam Dang	University of Verona, Italy	M
63	Nguyễn Văn Đức	THPT Nguyễn Thượng Hiền	M
64	ĐẶNG XUÂN QUÝ	ĐHSP	S
65	Bùi Quang Thịnh	Đại học Tiền Giang	P
66	Ngô Thị Mỹ Phượng	Cao đẳng Y tế Tiền Giang	P
67	Ông Thanh Hải	HCMUS	F
68	Võ Đức Cẩm Hải	HCMUS	F
69	Lê Bá Ngân	HCMUS	S
70	Lê Hoàng Minh	HCMUS	S
71	Trần Hương Lan	Đại học Sư phạm kỹ thuật TP HCM	F
72	Nguyễn Phan Thành Đạt	HCMUS	S
73	Tôn Thất Tâm Định	HCMUS	S
74	Nguyễn Thị Kiều Trang	HCMUS	S
75	Lê Thị Tuyết Nhung	HCMUS	S
76	Phạm Trương Hoàng Đức	Đại học Tôn Đức Thắng	M
77	Huỳnh Phước Trường	Trường Đại học Sư phạm TP.HCM	M
78	Tạ Quang Tuấn	HCMUS	S
79	Nguyễn Phan Thành Đạt	HCMUS	S