

(a) To organize some working groups of Vietnamese and oversea Algebraic Topologists;

(b) To give an opportunity for young Vietnamese Algebraic Topologists to work together with some international experts, and therefore to learn from them;

(c) To let some international experts on Algebraic Topology know about the Vietnam Algebraic Topology school;

(d) To partially introduce the Vietnam Mathematical Community to the World.

Workshops/ Conferences

6 workshops, conferences have been organized by the VIASM since July 2017:

- Workshop on Stochastic Dynamical Systems, July 10-15, 2017 (Quang Ninh province).
- Stochastic processes- Actuarial science and Finance, July 31-August 8, 2017.
- Conference on Automorphic Forms and Related Topics, August 21-24, 2017 (Quang Ninh province).
- Partial Differential Equations and Applications, October 4, 2017.
- Conference on Algebraic Topology in Tuan Chau, November 4-13, 2017 (Quang Ninh province).
- Workshop-Conference on Earthquakes and Tsunami: Modeling and Observations, December 11-22, 2017.

Conference on Automorphic Forms and Related Topics (August 21-24, 2017)

The Conference on Automorphic Forms and Related Topics was organized in four days, from August 21-24, 2017, in Tuan Chau, Quang Ninh. There were 22 participants attending the conference, among them are few master students and young PhD students.



The Participant of Workshop

Thirteen experts from Vietnam, France, USA, Singapore, Japan, India and China had given excellent lectures at the conference. The lectures covered recent development in the field such as extension of Gross-Prasad conjecture, Unipotent representation of real classical groups, Singularities of the arc

spaces, Fourier transformations over finite fields, Basic functions, Affine group schemes over DVRs, Mixed motives in the cohomology of \mathbb{A}_g , Relative functoriality conjectures, etc.

Special Programs

4 public lecture, 3 special schools and 7 mini-courses have been organized:

- **LSAM 2017: Predators-prey model with competition: the emergence of packs and territoriality** by Prof. Henri Berestycki (Ecole des hautes études en sciences sociales (EHESS), PSL Research University, Paris), July 25-26, 2017.
- **LSAM 2017: The effect of a line with fast diffusion on Fisher-KPP propagation** by Prof. Henri Berestycki (Ecole des hautes études en sciences sociales (EHESS), PSL Research University, Paris), July 27, 2017.
- **Mini-course "Lectures on Advanced Regression Methods"** by Prof. Vincent Lefieux (RTE Paris, France), July 24-28, 2017.
- **Mini-course "Lectures on Reliability Analysis of Repairable Systems"** by Prof. Jean-Yves Dauxois (INSA-IMT University of Toulouse), July 24-28, 2017.
- **LSAM 2017: Control of nonlinear systems** by Prof. Jean-Michel Coron (Université Pierre et Marie Curie, France), August 14-18, 2017.
- **Mini-course "Algebraic Curves"** by Prof. Ngo Bao Chau (VIASM) and Pham Thanh Tam (Hanoi Pedagogical University 2, Vietnam), September 5-16, 2017.
- **Mini-course "Special topics for classical damped wave models"** by Prof. M.Reissig (Faculty of Mathematics and Computer Science Technical University Bergakademie Freiberg, Germany), November 22-30, 2017.
- **Public Lecture "Calculating divergent sums"** by Prof. Ngo Bao Chau (Chicago University, USA & VIASM), August 13, 2017.
- **Public Lecture "Probing the hidden dimensions of space-time"** by Assoc. Prof. Nguyen Ai Viet (Institute of Information Technology, VNU-Hanoi), August 13, 2017.
- **Public Lecture "Teaching and learning Mathematics"** by Assoc. Prof. Le Anh Vinh (Vietnam Institute of Educational Sciences), August 13, 2017.

Workshop on Stochastic Dynamical Systems (July 10-15, 2017)

The first workshop on probability theory "Stochastic dynamical systems" was held in Tuan Chau from 10th to 15th of July 2017. It was jointly organized by VIASM, Prof. Jean-Stéphane Dherzin (University Paris 13 & LIA Formath Vietnam, France) and Prof. Marc Peigné (University Fr. Rabelais Tours, France). More than twenty researchers coming from all parts of Vietnam, from south to north, and also five researchers coming from France attended the workshop.



The Participant of Workshop

There were two advanced courses on stochastic dynamical systems, given by Prof. Sara Brofferio (University of Paris Saclay) and Prof. M. Peigné. Several participants of this workshop also had the opportunity to share their new ideas in the research field. It was the occasion to see the variety of the topics in probability theory studied in Vietnam. This kind of meetings is very important for researchers to share their works, open themselves to new problems and discover new approaches. All the participants really hoped that this conference was the first one of a series of annual appointments to be organized in the future.

WHAT RESEARCHERS SAY?

"This is my third visit to VIASM. I feel comfortable with the dedication, thoughtfulness and professionalism of all staff here. I would like to thank VIASM for giving me a great place and time to do my research effectively after busy days of giving lectures at my university. I hope that the model of VIASM can be promoted and replicated so that many researchers in different regions can also have more chances to contribute to the development of science and technology of Vietnam." – Assoc. Prof. Nguyen Sum (Quy Nhan University)



Assoc. Prof. Nguyen Sum (Quy Nhan University)



FOR EXCELLENT RESEARCH IN VIETNAM

Vietnam Institute for Advanced Study in Mathematics (VIASM)

Founded in 2011

Address:
7th fl., Ta Quang Buu Library, in HUST campus
1 Dai Co Viet str., Hanoi, Vietnam.
Tel: (+84)-4-36231542
Fax: (+84)-4-36231543
Website: <http://www.viasm.edu.vn>

Board of Directors

Scientific Director: Prof. Ngo Bao Chau
Managing Director: Prof. Nguyen Huu Du
Deputy Director: Dr. Nguyen Thi Le Huong

FOR RESEARCH FELLOW APPLICANTS

For more information, please visit:
<http://viasm.edu.vn/news-and-events/information-for-applicants>

Updated activities of the National Program for the Development of Mathematics (NPDM)

In the second half of 2017, the NPDM continued granting scholarships for the first semester of the school year 2017-2018 to 188 math students and 295 high school gifted students specializing in math (each scholarship is worth of 9.1 million VND). In addition, the Program continued selecting and awarding 98 math publications (each

award is worth of 32.500 million VND).

Moreover, 3 training schools for math teachers and high school gifted students specializing in math have been held with the total participation of 101 teachers and 371 students respectively.

In order to improve knowledge of excellent students and help them to be acquainted with international studying environment, Summer School on Mathematics and Science was held from June 19, 2017 to July 1, 2017 at High School for Gifted Students, Hanoi National University of Education with the participation of 58 students and 29 mentors.

Besides, the Institute assisted the NPDM to organize the Ceremony of Granting Mathematical Research Awards of 2016 and Students Scholarship for the academic year 2016-2017 within the organizing time of Math Open Day (MOD) 2017 on Math Seasons - From hidden dimensions (August 12 - 13, 2017). The Ceremony was to honor Mathematical Research Award authors and excellent students as well as inspiring the objectives and activities of NPDM in society.

FAST FACTS

56 and 20

56 research fellows and visiting professors came to work at VIASM from July to December 2017. Among them, there were 20 foreigners or Vietnamese people from abroad.

For more information, please visit:
<http://viasm.edu.vn/npdm/>



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Workshop "Stochastic processes- Actuarial science and Finance" (31/7-3/8/2017)

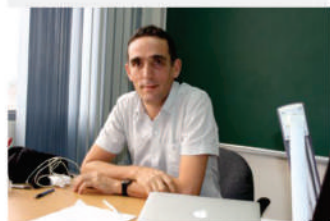
The workshop "Stochastic processes- Actuarial science and Finance" has gathered specialists of probability theory, who were working on applications in finance and insurance. Many scientific exchanges were done between participants all over the world: China, France, Germany, United

WHAT RESEARCHERS SAY?

"I have been in VIASM since the beginning of February 2017; it is a wonderful occasion to get an insider's view of the vitality of the Vietnamese school of mathematics.

The VIASM offers very good working conditions and nice environment to concentrate on research, to open up new topics, to exchange with colleagues and to organize events. A working group in applied probability took place in the first semester 2017; it was first the opportunity to read and understand some backgrounds on stochastic models in biology and second, to hear presentations of recent results obtained by researchers in VIASM during the semester. An important event during these few months was the SEAMS school "Mathematical Modelling in Biology", which was held from 8th to 15th of March and where I gave a course.

VIASM plays a central role for the knowledge dissemination of mathematics in Vietnam. Its director and its staff actively help me to organize and support a conference on stochastic dynamical systems, which takes place in July in Ha Long Bay, with the participation of researchers coming from different areas of Vietnam. During my stay here I received several invitations to give talks in other departments of mathematics in Ha Noi, in particular VAST... - Prof. Marc Peigné (former president of French Mathematical Society).



Prof. Marc Peigné (Université François Rabelais)

The NPDM Mathematical Awards 2017

The National Program for the Development of Mathematics (NPDM) called for applicants for Mathematical Awards 2017. The deadline for submission was June 30, 2017.

There were 190 papers applied for the Award and maximum 100 published papers will be selected. This year, each award is worth of 32.5 million VND.

Mathematics and Science Summer Program - MaSSP 2017

This year, the Institute collaborated with the MaSSP co-founders to organize the Summer Program in Hanoi from June 19 to July 1, 2017. MaSSP stands for Math and Science Summer

Program which was founded by some graduate students at MIT and Wellesley College, USA. The mission of MaSSP is to provide Vietnamese high school students, especially those from underprivileged backgrounds, with opportunities to explore applications of mathematics and science. In addition, students learn how to conduct re-search appropriately, think computationally, and communicate science effectively.

There were 58 high-school students studied four subjects (Mathematics, Computer Science, Physics and Computational Chemistry) under the mentorship of more than 30 Vietnamese graduates from universities over the world at MaSSP 2017.

This year program was sponsored by BIDV, FUNIX, Summit and Tinh Van Outsourcing.

For further information on the Program, please visit: <http://www.massp.vn>.

Research groups

From January until June 2017, there have been 18 research groups working at VIASM:

- Group on *Error Bounds for Generalized Equations and Variational Systems with Applications in Optimization* consisted of 2 members and 1 visitor: Prof. Pham Ky Anh (Head), Prof. Le Dung Muu, Prof. Stephan Dempe.
- Group on *Some problems on Geometry and Singularity of affine algebraic curves, surfaces and polynomials* consisted of 4 members and 4 visitors: Prof. Dr. Nguyen Van Chau (Head), Dr. Pho Duc Tai, Dr. Nguyen Tat Thang, Dr. Le Quy Thuong, Prof. Masaharu Ishikawa, Prof. Mutsuo Oka, Prof. Christophe Eyrat, Nguyen Hong Duc.
- Group on *Some selected problems in the theory of partial differential equations* consisted of 3 members: Prof. Nguyen Minh Tri (Head), MSc. Dao Quang Khai, MSc. Duong Trong Luyen.
- Group on *Homogenization of two-dimensional very rough interfaces* consisted of 3 members and 3 visitors: Assoc. Prof. Pham Chi Vinh (Head), Dr. Tran Thanh Tuan, Dr. Do Xuan Tung, Prof. Chiara Zanini, Prof. Marita Thomas, Prof. Marcos Aurelio Capistran Ocampo.
- Group on *No-gap second-order optimality conditions for optimal control problems governed by partial differential equations*



Professors, mentors and students of MaSSP 2017

with pure state constraints consisted of 2 members: Dr. Bui Trong Kien (Head), Dr. Vu Huu Nhu.

- Group on *Carleman estimates and applications* consisted of 2 members: Dr. Nguyen Anh Tu (Head), Dr. Dang Anh Tuan.
- Group on *Complex and Riemannian Geometry* consisted of 3 members and 1 visitor: Dr. Ninh Van Thu (Head), Dr. Ngo Quoc Anh, Dr. Nguyen Thac Dung, Kim Hyeseon.
- Group on *Qualitative Theory for Evolution Equations and Applications* consisted of 3 members, 4 visitors and 1 intern: Assoc. Prof. Nguyen Thieu Huy (Head), Dr. Trinh Viet Duc, Dr. Vu Thi Ngoc Ha, Prof. Matthias Hieber, Prof. Nguyen Van Minh, Dr. Vu Trong Luong, Prof. Wolfgang Arendt, ThS. Nguyen Thanh Tung.
- Group on *Some problems about approximation of plurisubharmonic and holomorphic functions* consisted of 3 members: Prof. Nguyen Quang Dieu (Head), Dr. Phung Van Manh, Dr. Tang Van Long.
- Group on *Optimization Approaches for Computing Geometric Shortest Paths in Low Dimensions: Algorithms, Implementations and Visualizations* consisted of 5 members: Assoc. Prof. Phan Thanh An (Head), Dr. Hoang Nam Dung, Dr. Dinh Thanh Giang, Dr. Nguyen Duc Manh, Dr. Le Hong Trang.
- Group on *Stationary measures for stochastic differential equations with Hölder continuous coefficients* consisted of 2 members, 1 visitor and 2 interns: Dr. Luu Hoang Duc (Head), Dr. Tran Tat Dat (Head), MSc. Phan Thanh Hong, MSc. Cao Tan Binh, Prof. Max-Olivier Hongler.
- Group on *Liouville-type theorems for nonlinear elliptic and parabolic problems* consisted of 2 members: Dr. Phan Quoc Hung (Head), Dr. Duong Anh Tuan.
- Group on *Numerical Solutions and Long-term Behavior of Stochastic Differential Equations with non-Lipschitz Coefficients* consisted of 3 members and 1 intern: Dr.

Ngo Hoang Long (Head), Dr. Nguyen Thanh Dieu, Dr. Ta Cong Son, MSc. Tran Dinh Tuong.

- Group on *On the Nevanlinna theory and its applications* consisted of 6 members, 6 visitors and 2 interns: Assoc. Prof. Tran Van Tan (Head), Prof. Ha Huy Khoai, Assoc. Prof. Ta Thi Hoai An, Dr. Le Giang, Dr. Nguyen Van Thin, Dr. Nguyen Thi Ngoc Dieu, Prof. Paul Vojta, Prof. William Allen Cherry, Prof. Liang-Chung Hsia, Prof. Julie Tzu-Yueh Wang, Prof. Min Ru, Prof. Gisbert Wustholz, MSc. Nguyen Viet Phuong, Vu Thuy Duong.
- Group on *Some problems on D-modules in positive characteristic* consisted of 3 members, 2 visitors and 2 interns: Prof. Phung Ho Hai (Head), Dr. Nguyen Chu Gia Vuong, Dr. Ngo Lam Xuan Chau, Assoc. Prof. Joao Pedro dos Santos, Prof. H. Esnault, Nguyen Luong Thai Binh, Pham Thanh Tam.
- Group on *Some selected problems of probability theory and statistics* consisted of 3 members and 2 interns: Prof. Nguyen Van Quang (Head), Dr. Nguyen Van Huan, Dr. Duong Xuan Giap, MSc. Bui Nguyen Tram Ngoc, MSc. Do The Son.
- Group on *Multivariate Public Key Cryptography* consisted of 2 members and 4 interns: Dr. Duong Hoang Dung, Dr. Le Van Luyen, MSc. Ngo Thi Bao Tran, MSc. Nguyen Thuy Duong, Nguyen Anh Tuan, Bui Kim Minh.
- Group on *Definitive Screening Designs using Weighing Matrices* consisted of 2 members: Dr. Nguyen Ky Nam (Head), MSc. Pham Dinh Tung.

Vietnam-Korea Workshop on selected topics in Mathematics

Fifty Korean researchers and one hundred mathematicians from the Institute of Mathematics and universities nationwide attended the Vietnam-Korea Workshop on selected topics in Mathematics at Duy Tan University (DTU, Da Nang) from February 20 to February 24, 2017. The Workshop was jointly held by the Institute of Mathematics (Vietnam Academy of Science and Technology), VIASM, the Korean Institute for Advanced Study (KIAS), the Korean Advanced Institute of Science and Technology (KAIST), and DTU.

The Workshop provided a forum for participants from the two countries to share their ideas and results, as well as strengthening ties between Vietnamese and Korean mathematicians.

Speaking at the event, Prof. JongHae Keum, the former President of KIAS, said: "The collaboration between Vietnamese and Korean mathematicians started more than 20 years ago. In recent years, more workshops have been organized to create excellent



Representatives of participants of Vietnam-Korea Workshop on selected topics in Mathematics

opportunities for mathematicians to exchange information and their experiences. Their ideas and the results of their research have been successfully applied in real-life in many areas of society."

Ninety-three papers were presented at the Workshop, focusing on the following selected areas in Mathematics: Algebra; Geometry; Commutative Algebra and Number Theory; Dynamics; Partial Differential Equations and Differential Equations, Systems of Dynamics and Optimization.

Notable work were presented by Vietnamese and Koreans participants, including "Dynamics beyond hyperbolicity" by Prof. Keonhee Lee from the National Chungnam University in Korea, and "Dynamical behavior of population in random environments" by Prof. Nguyen Huu Du - Managing Director of VIASM.

For further information, please visit: <http://viasm.edu.vn/en/hdtk/vk2017>

Visitors

- Prof. Wolfgang Arendt, University of Ulm, Germany.
- Prof. Nero Budur, KU Leuven, Department of Mathematics, Belgium.
- Prof. William Allen Cherry, University of North Texas, USA.
- Dr. Nguyễn Hồng Đức, Basque Center for Applied Mathematics, Spain.
- Prof. H. Esnault, Freie Universität Berlin, Germany.
- Prof. Christophe Eyrat Institute of Mathematics, Polish Academy of Sciences, Poland.
- Prof. Matthias Hieber, Technische Universität Darmstadt, Germany.
- Prof. Max-Olivier Hongler, EPFL SMT-GE, Switzerland.
- Prof. Liang-Chung Hsia, National Taiwan Normal University, Taiwan.
- Prof. Kim Hyeseon, Center for Mathematical Challenges, KIAS, Korea.
- Prof. Masaharu Ishikawa, Tohoku University Aoba, Japan.

Workshop on topology of singularity in Hanoi 2017

The three-day workshop "Topology of Singularity" started at VIASM on February 20, 2017. The aim of the workshop was to create a forum for researchers from Japan and Vietnam to exchange methods, new ideas, results, and perspectives on singularity theory. The studies of polynomial maps and plane curves have had great progresses in these thirty years due to deep communications between Japanese and Vietnamese mathematicians. The methods of these studies were very wide, including many techniques in algebraic geometry, topology and singularity theory. In the workshop, researchers discussed recent progress following these communications and related topics in the field.

There were 11 talks and a poster session. The talks by Hiroo Tokunaga, Christophe Eyrat, Nguyen Viet Dung, Jean-Paul Brasselet, Ichiro Shimada were about global study such as topology of the complement; the talks by