



FOR EXCELLENT RESEARCH IN VIETNAM



**Vietnam Institute for Advanced Study in Mathematics (VIASM)**

**Founded in 2011**

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Setting up for the Math Open Day

**FOR RESEARCH FELLOW APPLICANTS**

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

**The 5<sup>th</sup> anniversary of VIASM**

VIASM has successfully organized a ceremony to celebrate five years of operation of the National Program for the Development of Mathematics and VIASM's 5<sup>th</sup> anniversary on December 20, 2015. Prof. Pham Vu Luan, Minister of Education and Training, and many other distinguished guests, VIASM research fellows, math teachers and students from high school for gifted students and universities, parents and secondary pupils attended the ceremony. Over the past five years, the Program had granted the total scholarship of more than 23.2 billion VND for 682 math students and 1139 high school gifted students; awarded more than 7.4 billion VND for 271 publications of 478 mathematicians. VIASM had welcomed 150 international mathematicians from 18 countries, 47 Vietnamese mathematicians abroad, created a good working environment, which was highly appreciated by Vietnamese and international mathematical society. In recognition of VIASM's efforts and its excellence achievements over 5 years, the Minister of Education and Training conferred a Certificate of Merits to the Institute at the Ceremony.

Throughout the day, many activities of the Math Open Day "Mathematics in a nutshell" was also taken place at the surround space of VIASM, in which young-age guests can experience mathematics in new and exciting ways.

**SOME PHOTOS**



Prof. Pham Vu Luan, Minister of Education and Training handing a Certificate of Merits to VIASM.



Children learning and playing with mathematics under the instruction of volunteers in the Math Open Day.



Children learning and playing with mathematical models in the Math Open Day.

**Banner's photo:** Prof. Pham Vu Luan, Minister of Education and Training delivering his speech at the 5<sup>th</sup> anniversary of VIASM.

## Activities of the National Program for the Development of Mathematics (NPDM)

As annual activities, training schools for high school math teachers and high school gifted math students have been held in 2015. This year, two training schools for math teachers were held in the north and the south of Vietnam with the participation of 89 teachers from high schools for gifted students over the country.

Like last year, two training schools for high school gifted students were also held again in Hanoi and Vung Tau City with the participation of 97 and 107 high school students respectively.

Besides, two conferences on the content and teaching methods in Statistics were taken place in the southern province of Can Tho and the northern province of Phu Tho, attracted more than 100 people in each region. The conferences discussed the teaching and training programs of statistics in colleges as well as suggestions to enhance the quality of teaching statistics in colleges.



Dr. Nguyen Van Minh Man (HCMC University of Technology) giving a talk at the Conference on the content and teaching methods in Statistic (Can Tho, December 4-5, 2015).

Moreover, the Program continued calling for applications for Mathematical Research Awards 2015. There were 168 papers applied for the Award and 86 published papers have been granted.

NPDM's website:  
<http://viasm.edu.vn/npdm/>

### FAST FACTS

# 55 and 22

55 research fellows and visiting researchers came to work at VIASM from July to December 2015. Among them, there were 22 foreigners or Vietnamese people from abroad.

## VIASM Annual Meeting 2015

Annual Meeting is a regular event of VIASM organized following the example of



Participants of Summer school on Statistical Machine Learning (Aug 7-14, 2015)

Bourbaki seminars. VIASM invites leading mathematicians to report on exciting developments in their field of expertise, and generally not on their own work. The reports are to be written by the time of the meeting and will be published in a special issue of Acta Mathematica Vietnamica.

VIASM Annual Meeting 2015 was the third event in the series, which took place in two days 22-23 August, 2015. Invited speakers were Prof. Henri Berestycki (CNRS / EHESS, France), Prof. Hwang Jun-Muk (Korea Institute for Advanced Study, Korea), Prof. Marc Levine (University Duisburg-Essen, Germany), Prof. François Loeser (University Pierre et Marie Curie, France), and Prof. Cédric Villani (Institut Henri Poincaré (UPMC/CNRS), France, Fields Medal 2010). The workshop attracted more than 60 participants.



Prof. Cédric Villani (Institut Henri Poincaré, France, Fields 2010) at Annual Meeting 2015.

For more information, please visit:  
<http://viasm.edu.vn/hdkh/am2015/>

## Summer school on statistical machine learning

The school began with the public lecture "Introduction to Statistical Machine Learning" by Prof. Ho Tu Bao (Japan Advanced Institute of Science and Technology) on August 7th, 2015, attended

by over 100 participants from universities and institutions in Vietnam.

The public lecture concentrated on the development, main contents, characteristics and the relationship between Statistical Machine Learning, Data Mining, Big Data Analytics as well as introduced the second part of the school. The second part of the School was about "Nonparametric Bayesian statistics: some modeling, algorithm and theory" by Assoc. Prof. Nguyen Xuan Long (University of Michigan) from August 10-14, 2015. These lectures were to enhance the knowledge of young mathematicians who intensive study in statistical machine learning. For more information, please visit:  
<http://viasm.edu.vn/events/summer-school-on-statistical-machine-learning/>

### WHAT RESEARCHERS SAY?

"The VIASM is a comfortable place, very convenient to work quietly. The administrative structures are efficient. Of course VIASM is quite young compared to the other international institutes I know: the IAS in Princeton, IHES in Bures-sur-Yvette, MSRI in Berkeley... but a bright future certainly lies ahead.." – Prof. Jean Lannes.



Prof. Jean Lannes  
(Université Paris Diderot, France)

## WHAT RESEARCHERS SAY?

"Being the coordinator of workshops and seminars initiated by working groups, VIASM creates a fruitful forum where we can discuss on the active aspects with leading specialists in our field. During our time at VIASM, we participated in the Workshop on Evolution equations and Applications and a course on this subject given by Prof. Matthias Hieber that brought forward an attractive direction in study of PDEs. It is also a good time to implement our research plan, that gathers our colleagues from other institutions into a project. We greatly appreciate the VIASM supports together with the scientific atmosphere and hospitality." - Assoc. Prof. Tran Dinh Ke.



Assoc. Prof. Tran Dinh Ke  
(Hanoi National University of Education)

## Research groups

From July 2015 until December 2015, there have been 10 research groups working at VIASM:

- Group on *Differential Equations and Dynamical Systems* consists of 3 members: Assoc. Prof. Cung The Anh (Head), Assoc. Prof. Tran Dinh Ke, and Dr. Le Van Hieu.
- Group on *Partial Differential Equations* consisted of 2 members: Prof. Mouez Dimassi (Head) and Dr. Duong Anh Tuan.
- Group on *Potential Theory and Complex Geometry* consisted of 3 members: Assoc. Prof. Pham Hoang Hiep (Head), Dr. Nguyen Van Phu, and Dr. Vu Viet Hung.
- Group on *Variational Analysis and Applications* consisted of 2 members and 1 intern: Assoc. Prof. Nguyen Bich Huy (Head), Dr. Le Xuan Truong, and MSc. Bui The Quan.
- Group on *Evolution Equations (CODE, PDE and Applications)* consists of 3 members and 2 visitors: Assoc. Prof. Nguyen Thieu Huy (Head), Dr. Do Duc Thuan, Dr. Trinh Viet Duoc, Prof. Matthias Hieber, and Prof. Nguyen Van Minh.
- Group on *Algebraic Topology* consists of 5 members, 1 visitor and 1 intern:

Prof. Nguyen Huu Viet Hung (Head), Prof. Jean Lannes, Assoc. Prof. Le Minh Ha, Dr. Vo Thi Nhu Quynh, Msc. Ngo Anh Tuan, Prof. Lionel Schwartz, and Dr. Nguyen The Cuong.

- Group on *Stability and Control of Dynamical System* consisted of 3 members: Prof. Vu Ngoc Phat (Head), Dr. Le Hai Yen, and Dr. Nguyen Truong Thanh.



Dr. Le Hai Yen  
(Institute of Mathematics, VAST)

- Group on *Topology and Geometry* consists of 5 members: Prof. Alexander S. Mishchenko (Head), Prof. Vladimir Manuilov, Prof. Do Ngoc Diep, Assoc. Prof. Theodor Popelensky, and Assoc. Prof. Georgy Sharygin.
- Group on *Qualitative Theory of Random Dynamical Systems* consisted of 4 members: Dr. Doan Thai Son (Head), Dr. Nguyen Thi Thuy Quynh, Dr. Nguyen Thi The, and MSc. Hoang The Tuan.
- Group on *Dynamical Systems and Applications* consists of 2 members: Dr. Le Huy Tien (Head) and Dr. Nguyen Trong Hieu.

## Visitors

- Prof. Henri Berestycki, CNRS / EHESS, France.
- Prof. Bruno Frederic Campana, Université de Lorraine, France.
- Prof. Gerd Dethloff, Université de Brest, France.
- Prof. Jean-François Dupuy, INSA de Rennes, France.
- Prof. Matthias Hieber, Technische Universität Darmstadt, Germany.
- Dr. Bertrand Iooss, EDF R&D, France.
- Prof. Thierry Klein, Université Paul Sabatier (Toulouse 3), France.
- Prof. Agnes Lagnoux, Université Toulouse 2, France.
- Prof. Marc Levine, Universität Duisburg-Essen, Germany.
- Prof. François Loeser, University of Pierre and Marie Curie, France.
- Prof. Hwang Jun-Muk, KAIST, Korea.

- Prof. Nguyen Van Minh, Columbus State University, USA.
- Prof. Lionel Schwartz, University of Paris 13, France.
- Assoc. Prof. Ngo Duc Tuan, University of Paris 13, France.
- Prof. Cédric Villani, Institut Henri Poincaré (UPMC/CNRS), France.



Prof. Henri Berestycki  
(CNRS / EHESS, France)

## Workshop on Quantum Information Theory and related Topics (Sep 1-3, 2015)

The quantum information science is a new information science based on the principle of quantum mechanics. Each state in quantum mechanics can be represented by a density matrix. A total of 21 talks was given at the Workshop on Quantum Information Theory and related Topics from 1 to 3 September 2015. This workshop aims to bring recent study in this topic: The analysis/geometry structures on the space of positive semi-definite operators, operator inequalities, maps preserving orders on operators and related topics (such as moment problem). This workshop also created many opportunities for young mathematicians to exchange ideas and discuss with international mathematicians.

## Summer School "Number Theory through the ages" (Sep 7-11, 2015)

The Summer School's target audience was graduate students and advanced undergraduates in number theory, algebra and related areas. While modern number theory has a reputation of being technically formidable and complicated, many well-known classical problems in number theory like Fermat's Last Theorem, the Prime Number Theorem and Quadratic Reciprocity admit elementary formulations. The Summer School's main aim was to bridge the seemingly wide gap between the two, by studying classical problems under a modern optic and expose how the fundamental modern ideas were conceived. It is the organizers' hope that such a study would encourage students to appreciate the beauty of number theory and pursue further study in the subject.



## Workshops/ Conferences

4 workshops, conferences have been organized by the VIASM since July 2015:

- VIASM Annual Meeting 2015, August 22-23, 2015.
- Workshop on Quantum Information Theory and Related Topics, September 1-3, 2015.
- Workshop on Evolution Equations and Applications, October 1-3, 2015.
- Workshop on Discrete Mathematics, December 11-12, 2015, at Tuan Chau (Quang Ninh province).

## Special Programs

1 public lectures, 3 special schools and 2 mini-courses have been organized:

- Public Lecture "Statistical Machine Learning and Big Data Analytics" by Prof. Ho Tu Bao (JAIST, Japan), August 7, 2015
- Summer School "Mathematical statistics tools: theory and practice", July 20-28, 2015
- Summer School on Statistical machine learning, by Prof. Ho Tu Bao (JAIST, Japan) and Assoc. Prof. Nguyen Xuan Long (University of Michigan, USA), August 7-14, 2015
- Summer School "Number Theory through the ages", by Prof. Ngo Bao Chau (VIASM & University of Chicago) and Dr. Le Hung Viet Bao (University of Chicago), September 7-11, 2015
- Mini-course "Homology decompositions and applications" by Prof. Jean Lannes (Université Paris Diderot, France), October 6 - November 26, 2015
- Mini-course "Analysis of Incompressible Fluid Flows: an Approach via Evolution Equations" by Prof. Matthias Hieber (Technische Universität Darmstadt, Germany), October 22-23, 2015.

## Workshop on Evolution Equations and Applications

The three-day workshop was held at VIASM on October 19 – 21, 2015. Leading experts in applied analysis and evolution equations from US, Germany, France, Japan, and Vietnam have attended the workshop to give lectures and talks on recent developments of the fields of ordinary and partial differential equations and their applications: to fluid dynamics, physical and biological problems, diffusion processes.

Central attention of the workshop focused on the well-posedness (or ill-posedness) and asymptotic behavior of solutions to evolution equations such as stability, periodicity, almost periodicity, existence of invariant manifolds for solutions to evolution equations. Applications to incompressible fluid flows, heat diffusions, implicit dynamical systems, control systems, gene propagations and algebraic differential equations have also been given.



*Prof. Matthias Hieber  
(Technische Universität Darmstadt, Germany)*

## VIASM invites research fellowship application for the year 2017

VIASM invites research groups and individuals to apply for short-term research stays for the year 2017 (min. 2 months, max. 12 months). Candidates can be groups or individuals who are teaching, doing research as well as applying mathematics in various areas of technology, economics and society. The Scientific Council of the Institute will evaluate the candidates and make the

selection of research fellows for 2017. Selected research fellows will be announced at the end of March 2016.

Among potential individuals, VIASM also offers 5 post-doctoral positions. Post-doctoral fellows will receive the same support as researchers, but for at most a one-year stay. Only applicants who achieved Ph.D. degrees after 1.1.2011 can be eligible.

Moreover, five mathematicians who are invited to work at the VIASM in 2017 would be selected to NIMS (Korea) or IMS (NUS-Singapore) from one to three months for research collaboration and exchange purposes.



*Research group of Assoc. Prof. Pham Hoang Hiep (Institute of Mathematics-VAST) in 2015.*

## VIASM Program of Excellence for Doctoral Training in Mathematics

The program of Excellence for Doctoral Training in Mathematics is a new activity of the National Program for the Development of Mathematics until 2020. VIASM will coordinate with the local and overseas doctoral training institutions, aiming at training Doctors in Mathematics at international level, with the capability of conducting independent research; identifying research topics suitable for the world's developing trend in mathematics and Vietnam's reality; cooperating and setting up research groups with foreign experts and research groups.

During the training period, PhD students will be supervised by local professors or professors working abroad. They also have the rights to receive monthly stipend, workplace support and residence accommodation at VIASM; as well as other supports from foreign educational institutions while studying abroad. Simultaneously, the obligations of PhD students are to accept and commit to follow the training process under regulations, procedures and plans of the Program; ensure the output requirements of the Program.

### FURTHER INFORMATION

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