



FOR EXCELLENT RESEARCH IN VIETNAM

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

**Founded in 2011**

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**BOARD OF DIRECTORS**

**Scientific Director:** Prof. Ngo Bao Chau  
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**Deputy Director:** Dr. Nguyen Thi Le Huong



BIDV President Tran Bac Ha (left) and VIASM Scientific Director Ngo Bao Chau (right) signing the MoU between the two partners on FMATHLab.

**The Ceremony of Granting Mathematical Research Awards and Student Scholarships 2015**

The Ceremony for Granting Mathematical Research Awards of 2014 and Student Scholarships for the academic year 2014 – 2015 was held at University of Science – VNU Ho Chi Minh City on May 16<sup>th</sup>, 2015.

Assoc. Prof. Bui Van Ga, Vice Minister of Education and Training (MOET) – Chief Executive of the “National Program for the Development of Mathematics until 2020” (NPDM) and Prof. Tran Van Nhung, General Secretary of the State Council for Professor Titles – Deputy Chief Executive of NPDM attended the Ceremony, among other Executive Board members, mathematicians as well as the representatives and students from universities and high schools all over Vietnam attended the Ceremony.

There were 70 publications awarded (each worth 25.300.000 VND, equivalent to 1157 USD) in total of 210 applications. These ones were published in ISI journals in 2013-2014.

The Program has granted scholarships (each worth 7.475.000 VND for one semester) for the academic year 2014-2015 to 178 students from 12 universities out of 237 nominated students and 297 high school students out of 409 nominated students from 71 gifted high schools on a nationwide.

During the past two years and the next years, along with the granting mathematical research awards and student scholarships, the Program has kept implementing other activities such as: organizing training schools for gifted students; organizing conferences on Vietnam mathematical development; funding for research on applications of mathematics in socioeconomic development etc.

VIASM has been always actively involved in these activities.

*Banner's photo: Vice Minister of MOET Prof. Bui Van Ga (right) and Prof. Tran Van Nhung (left) with representatives of Mathematical Research Award authors at the Ceremony.*

# VIASM Newsletter

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SOME PHOTOS



Universities' students at the Ceremony.



Prof. Phan Quoc Khanh handing certificates to granted highschool students at the Ceremony.



Representative of granted students express his feeling after receiving the NPDM scholarship.

**NPDM WEBSITE**

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

## The International Workshop on Some Selected Problems in Optimization and Control Theory

The International Workshop on Some Selected Problems in Optimization and Control Theory took place at the VIASM, from February 4 to February 7, 2015. This activity was jointly sponsored and organized by VIASM and Institute of Mathematics - VAST. There were 70 participants attending the four-day workshop.

Control Theory, with the famous achievements at its beginning like the Pontriagin Maximum Principle, the Bellman Dynamic Programming Principle, allows one to define and compute optimal trajectories of space crafts, develop robotics. It has many other applications in engineering sciences, economics. For instance, one can apply the theory to find an optimal growth of an economy.

According to Professor Nguyen Dong Yen – Chair of the Workshop, research in Optimization and Control Theory has been a central research direction of the Society for Industrial and Applied Mathematics (called briefly SIASM). This Society publishes several important journals: SIOPT, SJOC, and so on.

Quantitative studies in Optimization and Control Theory have yielded solution methods, software packages. Here interesting theoretical questions appear, for instance, the convergence and speed of convergence of the solution algorithms.

Therefore, many challenges in Optimization and Control Theory are waiting for new generations of researchers.

The event website:

<http://viasm.edu.vn/activities/spoct-2015>

### FAST FACTS

# 69 and 25

69 research fellows and visiting researchers came to work at VIASM from January to June 2015. Among them, there were 25 foreigners or Vietnamese people from abroad.

## The 5<sup>th</sup> National Congress on Probability and Statistics

The 5<sup>th</sup> National Congress on Probability and Statistics was held at University of Education – University of Da Nang from 23<sup>rd</sup> May to 25<sup>th</sup> May, 2015. The theme of this year was on research, applications and education of probability and statistics in Vietnam colleges.



The Congress was jointly organized by Institute of Mathematics – VAST, University of Sciences – VNU Hanoi, and Da Nang University of Education – University of Da Nang, and VIASM.

The Congress attracted more than 120 researchers and lecturers from 72 universities and research institutes nationwide. There was also the participation of some scholars from Australia, Japan, Singapore and the USA.



Prof. Nguyen Huu Du giving the opening speech of the Congress.

There were 8 plenary talks and 63 session talks at the 5 parallel sessions: Stochastic Analysis and Stochastic Dynamical Systems, Mathematical Statistics, Limit Theorems in Probability Theory, Probability theory and Statistics in Economy, Finance and Banking and Education in Probability and Statistics.

The Congress also included a round-table discussion on teaching probability and statistics in colleges as well as on the plan to form an association of applied probability and statistics.

Many thanks to the local host - Da Nang University of Education – University of Da Nang for their hospitality and crucial contribution to the success of the Congress.

For more information, please visit:

<http://viasm.edu.vn/activities/xstk2015/>

### WHAT RESEARCHERS SAY?

"I am very pleased to work at VIASM. Working environment at VIASM is very professional. It is very convenient for me to do my own research and to discuss with a lot of experts in my research area from different countries. Besides, with the wonderful staffs of VIASM, it is easy to organize scientific activities such as seminars, working groups, courses, workshops as well as conferences. It is awesome to be here!"- Dr. Nguyen Ngoc Doanh.



Dr. Nguyen Ngoc Doanh  
(Hanoi University of Science and Technology)

### Research groups

From January to June 2015, there have been 7 research groups working at the VIASM:

- ➔ Group on Algebra Geometry consists of 4 members: Prof. Phung Ho Hai, Dr. Ngo Lam Xuan Chau, Dr. Nguyen An Khuong, Dr. Nguyen Chu Gia Vuong.
- ➔ Group on Variational Analysis and Applications consists of 7 members and 2 visitors: Prof. Nguyen Dong Yen, Prof. Marc Lassonde, Dr. Nguyen Thanh Qui, Dr. Pham Duy Khanh, MSc.

Nguyen Thai An, MSc. Nguyen Thi Quynh Trang, MSc. Hoang Ngoc Tuan, Prof. Aussel Didier and Dr. Nguyen Van Luong.

- Group on Nevanlinna Theory and related topics consists of 3 members: Assoc. Prof. Tran Van Tan, Assoc. Prof. Ta Thi Hoai An, Assoc. Prof. Sy Duc Quang
- Group on Statistics and its applications consists of 5 members: Prof. Xavier Bressaud, Prof. Benoit Truong Van, Prof. Fabrice Gamboa, Prof. Jean-Yves Dauxois, Prof. Vincent Lefieux.
- Group on P-adic analysis, complex analysis consists of 2 members and 3 visitors: Prof. Ha Huy Khoai, Dr. Vu Hoai An, Prof. Vladimir Berkovich, Prof. Alexei.Pantchichkine, Prof. Siegfried Bocherer.
- Group on Non-Smooth Mechanics consists of 2 members and 2 visitors: Prof. Nguyen Quoc Son, Dr. Pham Kim, Prof. Jean-Jacques Marigo and Prof. Patrick Le Tallec.

New mathematical and numerical approaches were discussed and illustrated by various applications in the framework of Plasticity and Fracture.



The technical program of the Summer School consisted of two master courses (Variational Methods in Damage Mechanics and Nonlinear methods for Materials and Structures) which were presently offered in the Master Multiscales and Multiphysics Modeling of Materials and Structures of the Ecole Polytechnique, Paris, France. This summer school was addressed mainly for PhD students, researchers and engineers working in Mechanics, Applied Mathematics and Civil Engineering.

The School attracted more than 30 teachers and students from universities in Vietnam.

### Visitors

- Prof. Aussel Didier, University of Perpignan, France.
- Dr. Nguyen Van Luong, Institute of Mathematics - Polish Academy of Sciences, Poland.
- Sonny Vu, CEO - Misfit Wearables, USA.
- Prof. Nicole El Karoui, Pierre and Marie Curie University, France.
- Prof. Monique Jeanblanc, University of Evry Val d'Essonne, France
- Prof. George Yin, Wayne State University, USA.
- Prof. Xavier Bressaud, Toulouse University, France.
- Prof. Benoit Truong Van, Toulouse University, France.
- Prof. Fabrice Gamboa, Toulouse University, France.
- Prof. Jean-Yves Dauxois, Toulouse University, France.
- Prof. Vincent Lefieux, RTE & UPMC-ISUP, France.
- Prof. Vladimir Berkovich, Weizmann Institute of Science, Israel.
- Prof. Alexei.Pantchichkine, University of Grenoble I, France.
- Prof. Siegfried Bocherer, University of Mannheim, Germany.

- Prof. Jean-Jacques Marigo, Ecole Polytechnique, France.
- Prof. Patrick Le Tallec, Ecole Polytechnique, France.
- Prof. Pham Huu Tiep, University of Arizona, USA.
- Prof. Timothy E. O'Brien, Loyola University, USA.
- Prof. Mutsuo Oka, Tokyo University of Science, Japan.
- Prof. Vu Ha Van, Yale University, USA.



*Prof. Nicole El Karoui  
(Pierre & Marie Curie Université and Ecole Polytechnique, France).*

### Mini-course “Introduction to Credit Risk”

The mini-course “Introduction to Credit Risk” took place at VIASM from 30 March, 2015 to 6 April, 2015. The course was taught by Professor Nicole El Karoui (Université Pierre & Marie Curie and Ecole Polytechnique, France) and Professor Monique Jeanblanc (Université d’Evry Val D’Essonne, France). This course aims to promote mathematical finance in Vietnam and this is also one of the first activities of Lab for Research in Applied Mathematics in Economics, Finance and Banking (FMathLab).



*Prof. Monique Jeanblanc giving her lecture.*

The lecturers presented various models for the case of a single default, in particular the structural approach, the intensity based model, the density model and the general case. The two professors also explained the links between these approaches and show how to compute prices of defaultable claims. They used integration with respect to a single jump process and recalled how to use this simple tool. Parts of the lectures were also devoted to the multidefault case. Some basic facts on marked point processes were recalled. Copula and dynamic copula were also presented.

### WHAT RESEARCHERS SAY?

“It’s a great honor and privilege for me to spend six months as a VIASM’s Junior Researcher. Participating in the research group on Variational Analysis and Applications organized by Professor Nguyen Dong Yen was a wonderful opportunity for me. During the time at VIASM, I have had a lot of valuable chances to meet and discuss with many distinguished professors in my research area. Enthusiastic and proactive staff members and excellent working environment are the factors that make me find happiness at work.” – MSc. Pham Duy Khanh.



*MSc. Pham Duy Khanh  
(HCMC University of Education)*

### Summer School “Non-Smooth Mechanics”

The Summer School “Non-Smooth Mechanics” was organized at VIASM from June 8, 2015 to June 17, 2015. The objective of this summer school was to present some recent developments in the thermo-mechanical modeling of materials and structures.

## Workshops/ Conferences

7 workshops, conferences have been organized since January to June 2015:

- Vietnam – Korea joint meeting on Algebra, January 19-21, 2015 in Ha Long, Quang Ninh
- International Workshop on Some Selected Problems in Optimization and Control Theory, February 4-7, 2015
- The 6<sup>th</sup> International Conference on High Performance Scientific Computing, March 16-20, 2015
- The Workshop on p-adic analysis, April 7-10, 2015 in Ha Long, Quang Ninh
- The 13<sup>th</sup> Workshop on Optimization and Scientific Computing, April 23-25, 2015 in Ba Vi, Hanoi
- The 5<sup>th</sup> Vietnam National Congress in Probability and Statistics, May 23 -25, 2015 in Da Nang
- The PICS IMEA Mini-Workshop on Multi-Paradigm Modeling and Simulation of Complex Systems, May 26, 2015

## Special Programs

1 public lecture, 1 special school and 10 mini-courses have been organized:

- FU-VIASM Joint Mini-course “Database Joins: Worst-Case and Beyond” by Prof. Ngo Quang Hung (State University of New York at Buffalo), January 5-9, 2015.
- Public lecture “Machine learning for the Internet of Things: Making Smart Things Smart” by Dr. Sonny Vu (CEO, Misfit Wearable’s), January 16, 2015.
- Mini-course “Variational Analysis and Applications” by Prof. Marc Lassonde (Université des Antilles et de la Guyane, France), March 2 and March 10, 2015.
- Mini-course “Introduction to Credit Risk”, by Prof. Nicole EL KAROUI (Université Pierre et Marie Curie, France) and Prof. Monique Jeanblanc (Université d'Evry Val D'Essonne, France), March 30 - April 6, 2015.
- Mini-course “Basic Statistics Applications and Practice” by Prof. Benoit Truong (Toulouse University, France), April 7- 12, 2015 .
- Mini-course on Applied Nonlinear Statistical Methods by Prof. Timothy E. O'Brien (Loyola University of Chicago, USA), May 14, 2015.
- Mini-course on Probabilistic Tools for Statistics by Prof. Xavier Bressaud (Institute of Mathematic, Toulouse University, France), May 18-21, 2015.
- Mini-Course on Modeling Platform GAMA by Prof. By Patrick Taillandier

(University of Rouen, France); Prof. Benoit Gaudou (University of Toulouse, France) and Prof. Philippe Caillou (University of Orsay, France), May 25, 2015.

- Mini-course on Advanced Tools/Concrete Examples for Statistics by Prof. Fabrice Gamboa (Institute of Mathematic, Toulouse University, France), May 26-29, 2015.
- Mini-course on Statistical Inference by Prof. Jean-Yves Dauxois (Institute de Mathématiques de Toulouse, France) and Prof. Vincent Lefieux (Electricité de France), June 8-12, 2015.
- Summer School “Non-Smooth Mechanics”, June 08-17, 2015.
- Mini-course “Expanders and Applications” by Prof. Vu Ha Van (Yale University), June 15 and June 17, 2015.

### FURTHER INFORMATION

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

## The PICS IMEA Mini-Workshop on Multi-Paradigm Modeling and Simulation of Complex Systems

The PICS IMEA Mini-Workshop on Multi-Paradigm Modeling and Simulation of Complex Systems took place on 26/05/2015 at VIASM.

The workshop aimed at presenting modern methods, new ideas, results and perspectives on modeling and simulation of complex systems. The workshop was split into two sessions: the morning session is about public transport and urban, the afternoon session is about environment, agriculture and epidemiology.

In this occasion, the experts both in modeling/simulation and in public transport/urban/environment/agriculture/epidemiology are able to set up future collaborations.

There were about 30 participants, including the French professors of the “Mini Course on Modeling Platform GAMA”.

## The Series of Activities on Probability and Statistics and Its Applications in 2015

In order to enhance the research capacity and the ability to apply Statistics Theory in solving problems on science, engineering, economics, medicine and environment in Vietnam, VIASM organizes a variety of scientific activities in this field in 2015. The well-known international mathematicians from Paris and Toulouse (France) has been giving lectures at mini-courses and a summer school which taking place from April to July, 2015.



Prof. Gamboa (Toulouse Université, France) in his mini-course on Advanced Tools/concrète exemples for statistiques.

The lectures aim to equip basic knowledge about Mathematics in Statistic Theory and Applications as well as computer practice on some sample exercises in the fields of economics, medicine, and statistics in the industry using the software Scilab.

The series consists of 5 mini-courses on Basic Statistics Applications and Practice by Prof. Benoit Truong, Probabilistic Tools for Statistics by Prof. Xavier Bressaud, Advanced Tools/Concrete Examples for Statistics by Prof. Fabrice Gamboa, Statistical Inference by Prof. Jean-Yves Dauxois and Prof. Vincent Lefieux, and a summer school with the topic “Mathematical statistics tools: Theory and Practice” (July 20-28, 2015).