

The Ceremony of Granting Mathematical Research Awards and Student Scholarships 2016

The Ceremony of Granting Mathematical Research Awards of 2015 and Student Scholarships for the academic year 2015 – 2016 (in the scheme of The National Program for Developing Mathematics until 2020 – NPDM) was held at Nguyen Van Dao Hall of Vietnam National University Hanoi on May 14th, 2016.

Assoc. Prof. Pham Manh Hung, Vice Minister of Education and Training (MOET) and Prof. Tran Van Nhung, General Secretary of the State Council for Professor Titles – Deputy Chief Executive of NPDM, among other Executive Board members, mathematicians as well as representatives and students from universities and high schools all over Vietnam attended the Ceremony.

There were 86 publications awarded (each worth 28.750.000 VND, equivalent to nearly 1300 USD) in total of 168 applications. These ones were published in ISI journals in 2014-2015 with at least one author was lecturer at Vietnamese colleges and no awarded author was co-author in 3 or more awarded publications.

The Program has granted scholarships (each worth 8.050.000 VND equivalent to 360USD for one semester) for the academic year 2015-2016 to 184 students from 12 universities out of 251 nominated students and 291 high school students out of 382 nominated students from 71 high schools for gifted students on a nationwide.

The total grant (for research award and scholarships) this year was over 9.6 billions VND (equivalent to 430,000 USD).

The Program has called for its research reward applications for 2016 in June.

VIASM has been always actively involved in these activities.



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

FOR DETAILS ON THE AWARD ACTIVITY

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



Mr. Bui Hong Quang (left) and Prof. Nguyen Huu Du (right) with some granted college students at the Ceremony.

2016 Research Awards - Call for applications in June

In 2016, the NPDM called for applications for the Program Mathematical Research Awards in June (instead of in October like in previous years).

Eligible papers should have already their publication numbers by June 30, 2016. Awarded authors would be recommended to spend a part of their award in mathematical development activities such as seminars/workshops/schools in the fiscal year of 2016.

From this year, authors can submit their applications online via the NPDM Research Award System at tct.viasm.edu.vn

Up-coming activities

In the coming months, VIASM will organize some other scientific activities as well as assisting the NPDM to implement its tasks.

Some of coming VIASM's scientific activities:

- Workshop: Stochastic processes - numerical methods and related topics, August 22 – 25, 2016.
- VIASM Lecture Series in Applied Mathematics 2016: "Interfaces and hysteresis in solid phase transformations" by Prof. Sir John Ball (Oxford, UK), August 23 - 25, 2016.
- VIASM Annual Meeting 2016, August 27, 2016.
- Summer School on Representation theory of finite and p-adic groups, August 29 – September 1, 2016.
- IACR-SEAMS School "Cryptography: Foundations and New Directions", November 27 – December 4, 2016.
- ASIACRYPT 2016, December 4 – 8, 2016.

Some NPDM's activities include training schools for students from universities and from high school for gifted students as well

as for math teachers from high schools for gifted students:

- Summer School for students 2016, July 11-24, 2016 in Quy Nhon.
- Summer School for high school students, July 10-16, 2016 in Hanoi (for schools in the North).
- Training school for math teachers, July 18-23, 2016 in Nha Trang (for schools in the South).
- Summer School for high school students, July 24-30, 2016 in Binh Phuoc (for schools in the South).
- Summer School for high school students, July 29 - August 4, 2016 in Quang Nam (for schools in the Middle).
- Training school for math teachers, August 8-13, 2016 in Vinh Phuc (for schools in the North).

Activities of the Cryptology Program in 2016

Cryptology is the focus of the Institute in 2016, with two major activities: an autumn school and an international conference.

The Autumn School "Cryptography: Foundations and New Directions" (Nov 27 – Dec 4) is jointly supported by the IACR, The SEAMS and The CIMPA. The School aims at providing an introduction of the most important technical and theoretical aspects of modern cryptography, with a view toward current developments in the field. More details on the School at: <http://viasm.edu.vn/hdkh/cryptoschool2016>.

The School will be just prior to ASIACRYPT 2016 (Dec 4-8), the 22nd Annual International Conference on the Theory and Applications of Cryptology and Information Security. The two events are complementary: the expository lectures given at the School will help participants to develop the background necessary to follow the talks at ASIACRYPT 2016.

More details about the Conference at: <http://www.asiacrypt2016.org/>



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Lecturers and students of the DAAD Spring School

Banner's photo: Vice Minister of MOET Prof. Pham Manh Hung (left) and Prof. Tran Van Nhung (right) with representatives of Mathematical Research Award authors at the Ceremony of Granting Mathematical Research Awards and Student Scholarships 2016 (details on page 4).

DAAD Spring School on Combinatorial Stochastic Processes

The Spring School "Combinatorial stochastic processes and its applications" was held at VIASM from March 7, 2016 to March 18, 2016.

This field studies random permutations and partitions of a large population, and the reverse process, the merging of smaller units into progressively larger communities, called coalescent. These processes are abundant in nature. In biology, species form a phylogenetic tree. In physics, particles merge or split at atomic levels. In engineering, gas and oil fields come in fragments of different sizes. In computer science, one wants to organize articles by topics, keywords or pictures to help searching and recommendation. In these applications, scientists often need to infer the partition or coalescent process from limited data. For example, given a collection of articles, one wants to organize them into major topics. Unlike clustering in machine learning, however, the articles may keep coming, new topics appear, and topics may merge overtime. Thus, both the data and the partition and coalescent processes are evolving, often at random. "Combinatorial stochastic processes" is precisely the area of mathematics that models such processes. It gives strong probabilistic theorems that allow scientists to do such inferences.

The goal of these lectures was to introduce graduate students, scientists and researchers in related fields to the major tools, open problems and applications of combinatorial stochastic processes. The discussion sessions served as a venue for the participants and lecturer to build a research



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community, mingle, exchange ideas, and worked on open questions.

There were six lecturers: two senior professors, three junior professors and one PhD candidate who gave the tutorials. Their diverse expertise covered the major topics of combinatorial stochastic processes, which were random trees, coalescent and diffusion processes, genealogy applications, random partitions, and random graphs.

The School attracted 40 participants from both within and outside of Vietnam, including Mongolia, the Philippines, Indonesia, Malaysia, and Singapore.

Vietnam-Korea Joint Workshop on Dynamical Systems and Related Topics

Vietnam-Korea Joint Workshop on Dynamical Systems and Related Topics was held at VIASM from March 2 to March 6, 2016.



Participants of the Joint Workshop.

The aim of this workshop was to bring together scientists to discuss and exchange the latest information and ideas on dynamical systems and applications. It was also to present some new results attained

by Korean and Vietnamese groups working in this area in recent years.

The workshop focused on the following topics: Differentiable and topological dynamical systems; Ordinary differential equations; Partially differential equations, Dynamic equations on time scales and Ergodic theory.

FAST FACTS

91 and 41

91 research fellows and visiting researchers came to work at VIASM from January to June 2016. Among them, there were 41 foreigners or Vietnamese people from abroad.

WHAT RESEARCHERS SAY?

"I was one of the first researchers at VIASM when it was established five years ago. This trip is my second visit. The admin staff are always professional and friendly. They provided invaluable help when we organized the workshop "Harmonic Analysis and Several Complex Variables". During my stay at VIASM, I had the opportunity to discuss mathematics with many experts. We exchanged ideas and have begun new collaborative projects." – Dr. Tran Vu Khanh, University of Wollongong, Australia.



Dr. Tran Vu Khanh
(University of Wollongong, NSW, Australia)

Research groups

From January until June 2016, there have been 11 research groups working at VIASM:

- Group on *Optimization Theory* consisted of 5 members and 3 visitors: Prof. Phan Quoc Khanh (Head), Dr. Le Thanh Tung, Dr. Huynh Thi Hong Diem, Dr. Nguyen Dinh Tuan, Dr. Nguyen Minh Tung, Prof. Szymon Dolecki, Prof. Abderrahim Jourani and Assoc. Prof. Truong Quang Bao.
- Group on *Noncommutative Geometry and Topology* consisted of 5 members and 1 visitor: Prof. Alexander S. Mishchenko (Head), Prof. Manuilov Vladimir M, Assoc. Prof. Popelensky

Theodor Yu, Assoc. Prof. Sharygin Georgij I, Prof. Do Ngoc Diep and Assoc. Prof. Le Anh Vu.

- Group on *Stein-Chen Method* consisted of 2 members and 2 intern: Assoc. Prof. Le Van Thanh (Head), MSc. Vu Thi Ngoc Anh, Nguyen Thi Thuy and Nguyen Ngoc Tu.
- Group on *Geometry and Topology* consisted of 9 members, 6 visitors and 1 intern: Assoc. Prof. Ha Huy Vui (Head), Assoc. Prof. Pham Tien Son, Dr. Dinh Si Tiep, Dr. Nguyen Tat Thang, Dr. Nguyen Thi Thao, Dr. Ho Minh Toan, Dr. Phan Thanh Tung, Prof. Krzysztof Kurdyka, Prof. Jean Bernard Lasserre, Prof. Gue Myung Lee, Prof. Ignacio Luengo, Prof. Kiyoshi Takeuchi, Prof. Zbigniew Jelonek, and Dr. Tran Gia Loc.



From left to right: Prof. Ngo Viet Trung, Prof. Ha Huy Tai, and Assoc. Prof. Adam Van Tuyl (Research group on Commutative Algebra)

- Group on *Computational Science* consists of 6 members: Prof. Ho Tu Bao (Head), Dr. Tran Cong An, Dr. Vo Thi Ngoc Chau, Dr. Than Quang Khoat, Dr. Nguyen Thanh Tung, Prof. Cao Hoang Tru.
- Group on *Discrete Mathematics* consists of 4 members, 2 visitor: Assoc. Prof. Phan Thi Ha Duong (Head), Assoc. Prof. Christophe Crespelle, Do Duy Hieu, MSc. Pham Van Trung, Prof. Robert Cori, Dr. Kevin Perrot.
- Group on *Universality of Nodal* consisted of 2 members: Dr. Pham Viet Hung (Head), Assnt. Prof. Guillaume Poly.
- Group on *Several Complex Variables* consisted of 2 members and visitors: Dr. Tran Vu Khanh (Head), Dr. Ly Kim Ha, Assoc. Prof. Andrew Raich, Prof. Xuan Thinh Duong.
- Group on *Harmonic Analysis and Operator Theory* consists of 3 members: Assoc. Prof. Thai Thuan Quang (Head), Dr. Ha Duy Hung, Dr. Luong Dang Ky.
- Group on *Commutative Algebra* consists of 11 members and 8 visitors: Assoc. Prof. Ha Huy Tai (Head), Prof. Ngo Viet Trung (Head), MSc. Do Trong Hoang, Dr. Nguyen Dang Hop, Dr. Ha Minh Lam, Assoc. Prof. Cao Huy Linh, Dr. Nguyen Phu Hoang Lan, Assoc. Prof.

Nguyen Cong Minh, Dr. Le Dinh Nam, Assoc. Prof. Nguyen Chanh Tu, Dr. Vu Quang Thanh, Prof. Frank-Olaf Schreyer, Prof. Marc Chardin, Prof. Juergen Herzog, Prof. Tim Roemer, PhD. Selvi Beyarslan, Prof. Claudia Polini, Prof. Bernd Ulrich, Assoc. Prof. Adam Van Tuyl.

- Group on *Natural Logic* consists of 3 members: Assnt. Prof. Trinh Huu Tue (Head), Dr. Andreas Haida, Assoc. Prof. Luong Chi Mai.

Visitors

- Prof. Florentin Smarandache, University of New Mexico, USA.
- Prof. Szymon Dolecki, University of Bourgogne, France.
- Prof. Abderrahim Jourani, University of Bourgogne, France.
- Assoc. Prof. Truong Quang Bao, Northern Michigan University, USA.
- Assoc. Prof. Le Anh Vu, University of Economics and Law, Vietnam.
- Dr. Nguyen Hong Duc, Quang Binh University, Vietnam.
- Prof. Krzysztof Kurdyka, Université Savoie Mont Blanc, France.
- Prof. Jean Bernard Lasserre, LAAS-CNRS, France.
- Prof. Gue Myung Lee, Pukyong National University, Korea.
- Prof. Kiyoshi Takeuchi, University of Tsukuba, Japan.
- Prof. Zbigniew Jelonek, Polish Academy of Sciences, Poland.
- Assoc. Prof. Wu Guohua, Nanyang Technological University, Singapore
- Dr. Kevin Perrot, Aix-Marseille Université, France.
- Assoc. Prof. Andrew Raich, University of Arkansas, USA.
- Prof. Xuan Thinh Duong, Macquarie University, Australia.
- Prof. Frank-Olaf Schreyer, Universität des Saarlandes, Germany.
- Prof. Marc Chardin, Université Pierre et Marie Curie, France.
- Prof. Juergen Herzog, Universität Duisburg-Essen, Germany.
- Prof. Tim Roemer, Universität Osnabrück, Germany.
- PhD student. Selvi Beyarslan, Tulane University, USA.
- Prof. Claudia Polini, University of Notre Dame, USA.
- Prof. Bernd Ulrich, Purdue University, USA.
- Assoc. Prof. Adam Van Tuyl, McMaster University, Canada.

- Prof. Paavo Salminen, Abo Akademi University, Finland.
- Assoc. Prof. Evans Gouno, Université de Bretagne Sud, France.
- Lionel Schwartz, Université Paris 13, France.
- Prof. Pham Huu Tiep, University of Arizona, USA.



Prof. Pham Huu Tiep
(University of Arizona, USA)

Workshops/ Conferences

8 workshops, conferences have been organized by the VIASM since January 2016:

- Vietnam - Korean Joint Meeting on Algebraic Geometry, February 17-19, 2016 in Tuan Chau (Quang Ninh province).
- Vietnam-Korea Joint Workshop on Dynamical Systems and Related Topics, March 2-6, 2016.
- IMH - VIASM Workshop on Algebraic Geometry, March 13-16, 2016.
- International Conference and 8th Japan-Vietnam joint Seminar on Commutative Algebra, March 21-25, 2016, in Tuan Chau (Quang Ninh province).
- The 14th Workshop on Optimization and Scientific Computing, April 21-23, 2016 in Ba Vi (Hanoi).
- Workshop on Random walks on graphs and some related problems, June 9-11, 2016 in Tuan Chau (Quang Ninh province).
- Workshop "Harmonic Analysis and Several Complex Variables", June 13, 2016.
- Mini-workshop on Analysis and Applications of PDEs, June 29, 2016.

Special Programs

2 public lectures, 1 special school and 7 mini-courses have been organized:

- Public lecture "Mathematics & Arts" by Prof. Nguyen Tien Dung (Toulouse, France), May 3, 2016 at Hanoi University of Mining and Geology.

- Public lecture "How to publish on international scientific journals?" by Prof. Truong Nguyen Thanh (Utah University, USA), June 25, 2016.
- Mini-course "Deformation quantization" by Prof. Sharygin Georgy (Moscow State Lomonosov Univ), Jan 11 and Jan 25, 2016.
- Mini-course "The Stable Marriage Problem", by Prof. Vu Ha Van (Yale University, USA), Feb 15 - Feb 16, 2016.
- Mini-course "Effective Aspects of Combinatorics" by Prof. Wu Guohua (Nanyang Technological University, Singapore), Feb 29 - March 3, 2016.
- DAAD Spring School on Combinatorial Stochastic Processes, March 7 - 18, 2016.
- Mini-course on optimal stopping of diffusions and Lévy processes by Prof. Paavo Salminen (Abo Akademi University, Finland), March 21 - 23, 2016.
- Mini-Course "Riemann-Roch Theory on graphs" by Assoc. Prof. Phan Thi Ha Duong (Institute of Mathematics), April 1 - 22, 2016.
- Mini-course "Introduction to Group Representation Theory" by Prof. Pham Huu Tiep (University of Arizona, USA), June 6-9, 2016.
- Mini-course "Introduction into entropy and duality methods for reaction-diffusion systems" by Prof. Klemens Fellner (Univ. of Graz, Austria), June 30, 2016.

Mini-course on The Stable Marriage Problem



Prof Vu Ha Van (Yale University, USA) giving the lecture.

Prof Vu Ha Van gave a series of talks on the stable marriage problem on February 15-16, 2016.

In this series of talks the stable marriage problem, which is of fundamental importance in economy, was discussed. The elegant solution of Gale and Shapley later earned Shapley a Nobel prize. Furthermore, the Gale-Shapley algorithm has a wide range of applications which may be of today interest. Recently, there have been

suggestions that it could even be used to aid the selection process to universities in VN.

The course started by first present Gale-Shapley's algorithm in details, its analysis, advantages and disadvantages. Next, the lecturer looked at the performance of the algorithm with respect to random inputs, and also in the situation when some of the participants decide to cheat. The running time and simplicity of the problem, which enable one to implement many versions of the algorithm in real life, was also focused.

WHAT RESEARCHERS SAY?

"VIASM is a great place to foster and nurture collaborative research. The focused program on Homological Methods in Algebra, Geometry and Combinatorics has been participated by various leading experts around the world together with many Vietnamese mathematicians. During the program, with an international conference and weekly working seminars, the Institute temporarily becomes a world center of activity in these research areas. The VIASM's staff are effective and comfortable to visitors. This type of academic community and research environment should be further encouraged and supported..." – Assoc. Prof. Ha Huy Tai.



Assoc. Prof. Ha Huy Tai
(Tulane University, USA)

Social activities

VIASM also organizes excursions in order to strengthen participants' knowledge about the landscape and history of Vietnam, as well as solidifying the relationship of the researchers and visitors.



The research group "Optimization Theory" at Fansipan (Lao Cai), June 2016.