



SOUTH EAST ASIAN MATHEMATICAL SOCIETY

SEAMS SCHOOL PROPOSAL

Mathematical Modelling in Biology

Hanoi, Vietnam

March 08 – March 15, 2017

Organized by

Vietnam Institute for Advanced Study in Mathematics

(VIASM)

Hanoi University of Science, Vietnam National University

(VNU-HUS)

2017

SEAMS SCHOOL PROPOSAL

1. The proposed title, place and dates of the SEAMS School

Title of the SEAMS School	: Mathematical Modelling in Biology
Place	: Vietnam Institute for Advanced Study in Mathematics Hanoi University of Science, Vietnam National University
Dates	: March 08 – March 15, 2017

2. Organizers (write the names, place of work, and email address, if you have more than two then add the necessary lines)

1. Name	: Nguyen Huu Du
Institution	: Vietnam Institute for Advanced Study in Mathematics
Email and Phone	: nhdu@viasm.edu.vn +84 4 36 23 15 30
2. Name	: Nguyen Trung Hieu
Institution	: Hanoi University of Science, VNU-Hanoi, Vietnam
Email and Phone	: NGTRHIEU@YAHOO.COM +84 4 38581135
3. Name	: Nguyen Ngoc Phan
Institution	: Hanoi University of Science, VNU-Hanoi, Vietnam
Email and Phone	: PHAN@HUS.EDU.VN +84 4 38581135
4. Name	: Tran Tat Dat
Institution	: Max Planck Institute for Mathematics in the Sciences
Email and Phone	: TRANDAT@MIS.MPG.DE +49 3419959843
5. Name	: Nguyen Trong Hieu
Institution	: Hanoi University of Science, VNU-Hanoi, Vietnam
Email and Phone	: HIEUNGUYENTRONG@GMAIL.COM +84 4 38581135

3. Short Description of the Scientific Content, the Aim of the proposed school and the potential Impact to the local academic system and/or society. (max 100 words)

This school is aimed to provide foundations of Mathematical Modelling in Biology, and to introduce some problems of the subject which are currently in the field of intensive research. The school is addressed to senior undergraduate students and first year graduate students from Southeast Asia. The school is expected to accommodate students with basic knowledge of the subject which will be necessary for further study, and the chance for the young researchers to meet professors from leading research institutions to learn about the opportunities to apply for the scholarships to persuade their PhD education in mathematics.

4. The speakers of the school (name, address, email, male/female).

1. Hien Tran, North Carolina State University, tran@control.math.ncsu.edu, male
2. Marc Peigne, Université François Rabelais, President of French Mathematical Society, Marc.Peigne@lmpt.univ-tours.fr, male
3. Fugo Takasu, Nara Women's University, takasu@ics.nara-wu.ac.jp, male
4. Tat Dat Tran, Max Planck Institute for Mathematics in the Sciences, trandat@mis.mpg.de, male
5. Nguyen Trung Hieu, Hanoi University of Science, VNU-Hanoi, ngtrhieu@yahoo.com, male

5. Describe in a few lines the local institution related to this school, including the main academic program and its strengths in teaching program and research. Give also the internet site of the local institutions. Do you plan to have a website of this SEAMS school?

1. VIASM: Vietnam Institute for Advanced Study in Mathematics
VIASM is the main institution in implementing the National Program for the Development of Mathematics from 2010 to 2020 (NPDM). This program is responsible for encouraging young students to learn mathematics, improving the quality of teaching and learning mathematics at school and university level as well as dissemination of scientific knowledge to the public.
The main activity of the Institute is organizing research groups to conduct research programs and projects of high quality. Scientists in the same field will gather and work together at the Institute in short-term basis. It aims to attract Vietnamese mathematicians

from abroad and international mathematicians to Vietnam and participate in research and training with their colleagues in Vietnam. This activity will strengthen the research branches which have taken root in Vietnam and will incubate the formation of new branches of Mathematics.

Every year, VIASM offers some Postdoctoral fellowships. These fellowships are intended for mathematicians with Ph.D.s awarded within 5 years. Postdoctoral Fellows must hold a Ph.D. at the time of their proposed residency. The fellowship is for one year and can be extended up to three years. The VIASM organizes conferences, workshops, seminars on topics associated with research groups working at the institute in order to implement their research projects, and to attract new students to do research.

In cooperation with NPDM, the Institute also holds summer schools for math students, short-term training courses for mathematics teachers and organizes other activities to disseminate scientific knowledge to the public.

The address of the institution is as follows:

The 7th floor, Ta Quang Buu Library, University of Science and Technology, 1 Dai Co Viet Street, Ha Noi, Viet Nam.

Tel: +84 4 36231542 - Fax: +84 4 36231543

Email: VIASM@VIASM.EDU.VN

Website: [HTTP://VIASM.EDU.VN/?LANG=EN](http://VIASM.EDU.VN/?LANG=EN)

2. Hanoi University of Science, VNU-HUS

University of Science, an integral part of Vietnam National University, Hanoi, is among several universities in Vietnam with long-standing tradition.

VNU University of Science, Hanoi is dedicated to conduct research in basic sciences and applications. The University is committed to initiating, propagating and promoting science knowledge; providing the society with a constant supply of high-qualified intellectual workers as well as high-quality scientific and technological products; actively contributing to the development of basic sciences of the country.

The Faculty of Mathematics, Mechanics and Informatics offers bachelor, master and PhD programs in mathematics, mechanics and informatics. There are seven groups including Mechanics, Algebra-Geometry-Topology, Mathematical Analysis, Informatics, Bio-Math, Computational and Applied Mathematics, Probability and

Statistics. Recently, there are 5 professors, 12 associate professors and 36 PhDs in the department.

The address of the university is as follows:

334 Nguyen Trai, Thanh Xuan District, Hanoi, Vietnam

Tel : +84 4 38581135

Website: [HTTP://HUS.VNU.EDU.VN/EN](http://HUS.VNU.EDU.VN/EN)

Our primary website of the school is the following:

(will be updated later)

6. Provide information on the number and distribution of expected participants. Give the percentage of female participants who will attend the school.

We expect 30 participants of which 20 are from Vietnam and 10 are from other Southeast Asian Countries. We expect at least 30% female participants.

7. Describe the objectives and the program of the proposed school, including the courses (max 5 courses), speakers (in each course), abstracts (8 lines for each course) and tentative schedule of the whole proposed school.

This Seams School is objected to provide some background necessary for the research in Mathematical Modelling in Biology. The participants will also be introduced some research projects which have been attracting the considerable interest of mathematicians in the field.

There will be four courses in the school. The titles and abstracts are as follows.

Course M1: Mathematical Modeling Techniques for Biological Systems

Lecturer: Hien Tran, Nguyen Trung Hieu

Abstract:

This course seeks to provide students with a fundamental understanding of how mathematics and statistics are applied to problems in life sciences. Our approach will be through several “case studies” problems that arise in biological applications. For each case study we will discuss why a model is needed and what goals are to be sought. We will examine the mathematical models both analytically and computationally in order to compare their behavior with that exhibited by the modeled phenomena. Such a

comparison can be achieved quantitatively through model verification and validation, which are central to the process of model development and evaluation for all complex systems. Some computational tools are also presented to simulate the models.

Course M2: Branching Processes

Lecturer: Marc Peigne

Abstract:

Galton-Watson branching processes describe the evolution of a population, assuming that individuals reproduce independently of each other to some given offspring distribution. One of the most important question concerns the probability of extinction of the population, with some transition phenomenon from subcriticality to supercriticality in several steps. We will present well known results in two natural generalizations and also recent ones concerning multi-type Galton-Watson processes in random environment. These results rely on a stimulating interplay between branching process theory and random walk theory.

Course M3: An introduction to mathematical population genetics

Lecturer: Tat Dat Tran

Abstract

This course seeks to provide students

- Mathematical models: Wright-Fisher models, Wright-Fisher models with other evolutionary factors (mutations, selection, recombination, migration), Fleming-Viot models.
- A fundamental knowledge about mathematical population genetics;
- Some advanced methods in studying mathematical population genetics;
- Open problems in mathematical population genetics.

Course M4: Individual-based modeling of population dynamics

Lecturer: Fugo Takasu

Abstract:

Models of population dynamics have been usually described by ordinary or partial differential equations. These models describe dynamics of population size or distribution over space as continuous variable at the expense of biological realism of being individual. Individual-based models assume individuals as "base unit", and thus they are more realistic but at the cost of mathematical tractability; dynamics of population size or

distribution over space becomes inherently stochastic and model analysis is not straightforward. The course content will be 1) Introduction of ODE/PDE models used in population ecology, 2) Reconstruction of these models as individual-based models, and 3) Mathematical analysis of these individual-based models.

The School will start on March 8 and will end on March 15, 2017. The school includes 40.5 hours for lectures and 3.5 hours for group discussions. The time of classes will be from 9:00 to 12:15 in the morning and from 13:30 to 17:30 in the afternoon. The tentative schedule is as follows.

Hour	Wed, Mar 8	Thu, Mar 9	Fri, Mar 10	Sat, Mar 11
9:00 – 10:30	Registration	M1	M1	M1
10:30 – 10:45		Break	Break	Break
10:45 – 12:15	M1	M2	M2	M2
12:15 – 13:30	Lunch	Lunch	Lunch	Lunch
13:30 – 15:00	M1	M1	M1	M3
15:00 – 15:15	Break	Break	Break	Break
15:15 – 16:45	M2	M2	M2	M4
16:45 – 17:00	Break	Break	Break	Break
17:00 – 17:30	Group Discussion	Group Discussion	Group Discussion	Group Discussion

Hour	Sun, Mar 12	Mon, Mar 13	Tue, Mar 14	Wed, Mar 15
9:00 – 10:30		M3	M3	M3
10:30 – 10:45		Break	Break	Break
10:45 – 12:15		M4	M4	M4
12:15 – 13:30		Lunch	Lunch	Lunch
13:30 – 15:00		M3	M3	M3
15:00 – 15:15		Break	Break	Break
15:15 – 16:45		M4	M4	M4
16:45 – 17:00		Break	Break	Break
17:00 – 17:30		Group Discussion	Group Discussion	Group Discussion

8. Provide information about provisional budget and the expected funding.

Provisional Budget

No	Item	Details	Sources		Total (EUR)
			CIMPA	Others	
1	Tickets				3800
	Overseas Participants		X		2800
	Domestic Participants			X	1000
2	Accommodation				4200
	Participants		X	X	3200
	Speakers		X	X	1000
3	Food Expenses		X	X	3000
4	Local Transport			X	500
5	Supplies and Printings			X	500
6	Living Expenses for Speakers			X	500
7	Social program (Exursion)				
	TOTAL				12500

Note: At least 2/3 of CIMPA support can be used for travel, accommodation and/or living expenses of young researchers (less than 38 or recent PhD) from neighbouring countries of the activity; at most 1/3 at most can be used for lecturers (economy class travel and/or standard living expenses).

CIMPA support cannot be used for: reimbursements for participants living in developed countries (even if their nationality is from a developing country); registration fees; proceedings; organizational expenses.

Expected Funding

No	Item	Confirmed (Yes/Not Yet)	Total
1	CIMPA		5500
2	VIASM	Yes	5000
3	HUS-VNU	Not yet	1000
4	ARC-VNU	Not yet	1000
	Total		12500

9. Provide CV for the organizer (2 pages max for each person, including current publication)

SCIENTIFIC CURRICULUM VITAE

PERSONAL DATA

Full name: NGUYEN HUU DU

Sex: Male

Nationality: VIETNAMESE

Date of birth: May 23, 1954

Full address and permanent institution:

- Vietnam Institute for Advanced Study in Mathematics (VIASM)

The 7th floor, Ta Quang Buu Library, University of Science and Technology, 1 Dai Co Viet Street, Ha Noi, Viet Na

- Faculty of Mathematics, Mechanics and Informatics; Hanoi National University, VNU
334 Nguyen Trai, Thanh Xuan, Hanoi, Vietnam

Email: nhdu@viasm.edu.vn

Profession: - Managing Director of Vietnam Institute for Advanced Study in Mathematics.
- Dean of Department of Mathematical Modeling in Ecology and Environment, Faculty of Mathematics, Mechanics and Informatics; Hanoi National University, VNU.

Education summary

- B.A., Mathematics, University of Hanoi, 1979 (with honors).
- Ph.D., Probability and Statistics, University of Hanoi, 1990.
- Title of professor, 2002.

Major Research interests:

- Theory of Optimal Control Problem for Stochastic Processes
- Stability of Dynamical Systems Described by Implicit Difference Equations or Algebraic Differential Equations.
- Stability of Stochastic Differential Equations
- Stability Radii
- Dynamics on Times Scales
- Applications of Random Dynamical Systems in Ecology and Environment
- Mathematical Methods in Finance

Positions Held:

- 1997-2006 Vice – Dean of Faculty of Mathematics, Mechanics and Informatics, VNU
- 2006-2013 Vice Rector of Hanoi University of Science-VNU
- 2008-2013 General Secretary of Vietnam Mathematical Society
- 2011-2013 Co Director of Francophonie Institute of Informatics
- 2013 President of Vietnam Mathematical Society
- 2013 Managing Director of Vietnam Institute for Advanced Study in Mathematics
- Editor of VNU Journal of Science, Vietnam Journal of Mathematics, Acta Mathematica Vietnamica, Asian-European J. of Mathematics, East Asian Journal of Mathematics.

Main Lectures and Training Courses

- Introduction to Fundamental Mathematical Analysis
- Mathematical Models in Economy and Biology
- Introduction to Linear Algebra
- Fundament of Probability Theory
- Introduction to Stochastic Processes and Their Applications

- Theory of Stochastic Processes and Its Application in Economy and Biology
- Optimal Control Problem for Deterministic and Stochastic Systems
- Markov Processes
- Random Dynamical Systems.

Books

- Lectures on Mathematical Analysis
- Statistical Analysis and Prediction
- Optimal Control for Deterministic and Stochastic Systems

Publications:

- 68 publications.
 - Last 3 years publications
1. Du N. H, Dang N. H and Dieu N.T.; On stability in distribution of stochastic differential delay equations with Markovian switching, *Systems and Control Letters*, 65 (2014), 43–49.
 2. Du, N. H.; Dang, N. H.; Asymptotic behavior of kolmogorov systems with predator-prey type in random environment, *Pure Appl. Anal.* 13 (2014), no. 6, 2693–2712
 3. Du, N. H.; Dang, N. H. and Yin, G.; Existence of Stationary Distributions for Kolmogorov Systems of Competitive Type under Telegraph Noise, *J. Differential Equations* 257 (2014), no. 6, 2078–2101.
 4. Du, N. H.; Dang, N. H. and Yin, G.; Study of Certain Stochastic Predator-Prey Models, *Proceedings of Conference on Control and Its Applications*, SIAM CT15 2015.
 5. Hieu N. T., Du N. H., Auger P. and Dang N. H.; Dynamical behavior of a stochastic sirs epidemic model, *Math. Model. Nat. Phenom.*, Vol. 10, No. 2, 2015, pp. 56–73.
 6. Du N. H., Tuan P.T and Dieu N.T.; On the exponential p–stability of stochastic dynamic equations on disconnected sets, *Electronic Differential Equations* No. 285(2015).
 7. Nguyen Thu Ha Nguyen Huu Du, Le Cong Loi and Do Duc Thuan, On the Convergence of Solutions to Nabla Dynamic Equations on Time Scales, *Dynamic Systems and Applications* 24 (2015) 451-466.
 8. Dieu, N.T.; Du, N. H.; Dang, N. H. and Yin, G.; Classification of Asymptotic Behavior in a Stochastic SIR Model, *SIAM J. Appl. Dyn. Syst.* 15,(2016), no. 2.
 9. Nguyen Thu Ha Nguyen Huu Du, Le Cong Loi and Do Duc Thuan, On the Convergence of Solutions to Dynamic Equations on Time Scales, *Qual. Theory Dyn. Syst.* Vol. 17, n0 1(2015), DOI 10.1007/s12346-015-0166-8
 10. Du, N. H.; Dang, N. H. and Yin, G.; Conditions for permanence and ergodicity of certain stochastic predator-prey models, *Journal of Applied Probability* 53(2016).
 11. Dieu, N.T.; Du, N. H.; Dang, N. H. and Yin, G.; Protection Zones for Survival of Species in Random Environment, *SIAM J. Appl. Math.* 76,(2016), no. 4.
 12. Nguyen Thu Ha · Nguyen Huu Du · Do Duc Thuan, On data dependence of stability domains, exponential stability and stability radii for implicit linear dynamic equations, *Math. Control Signals Systems* 28,(2016), no. 2
 13. Do Duc Thuan, Nguyen Huu Du, and Nguyen Chi Liem, Stabilizability and robust stabilizability of implicit dynamic equations with constant coefficients on time scales, *IMA Journal of Mathematical Control and Information*, Volume 33 Issue 1 March 2016.
 14. N. H. Du, V.H.Linh and N.T.T.Nga, On stability and Bohl exponent of linear singular systems of difference equations with variable coefficients, *J. of Diff. Eq. and Appl.* 2016 <http://dx.doi.org/10.1080/10236198.2016.1198341>
 15. Dieu, N.T.; Du, N. H.; Long-time behavior of an SIR model with perturbed disease transmission coefficient, accepted to *J. of Discrete and Continuous Dynamical Systems* 2016.
 16. Du N. H.; Liem N. C. and Hoa T. Anh. Lyapunov exponents for Dynamic Equations on Time Scales, *accepted to Ukraine Journal of Mathematics* 2014

CURRICULUM VITAE

Personal Data

Name Trung Hieu Nguyen
Date of Birth January 09, 1978
Place of Birth Hanoi, Vietnam
Address No. 8 Alley 76 Linh Lang Street Ba Dinh, Hanoi
Email ngrhieu@yahoo.com
Telephone 0906269908

Education

1999 B.Sc. in Applied Mathematics and Informatics
Hanoi University of Science
2002 M.Sc. in Scientific Computing
University of Nijmegen, the Netherlands
2009 Ph.D. in Numerical Mathematics
RWTH Aachen University, Germany

Experience

1999 - 2003 Hanoi University of Science, Vietnam
Faculty of Mathematics, Mechanics and Informatics
Lecturer
2003 - 2009 RWTH Aachen University
Institut für Geometrie und Praktische Mathematik
Scientific assistant
2010 - Hanoi University of Science, Vietnam
Faculty of Mathematics, Mechanics and Informatics
Lecturer

Current research topics

Iterative solvers, incompressible two-phase flows, mass transport, finite element methods.

Publications

1. A. Reusken and T. H. Nguyen, Nitsche-XFEM for a transport problem in two-phase incompressible flows, Proceedings of the ECCOMAS Thematic

Conference on Extended Finite Element Methods (XFEM 2009), RWTH Aachen.

2. A. Reusken and T. H. Nguyen, Nitsche's method for a transport problem in two-phase incompressible flows, *Journal of Fourier Analysis and Applications*, 15(5): 663-683, 2009.

3. T. H. Nguyen, Numerical methods for mass transport equations in two-phase incompressible flows, PhD thesis, RWTH Aachen, 2009.

Curriculum Vitae

NGUYEN NGOC PHAN

Department of Mathematics, Mechanics, and Informatics

VNU Hanoi University of Science

334 Nguyen Trai, Hanoi

Cell phone: 84 - 987 830 789

Email: phan@hus.edu.vn

Personal Data

- Date of birth: August 27, 1980
- Place of birth: Nghe An, Vietnam
- Country of citizenship: Vietnam

Research interests: Wavelet Theory and Harmonic Analysis

Education

- 2007 – 2012: PhD in Mathematics, New Mexico State University, USA
Advisor: *Joseph Lakey*
Dissertation: *Biorthogonal Multiwavelets Adapted to Boundary Value Problems*
- 2005 – 2007: M. Sc. in Mathematics, New Mexico State University, USA
- 1998 – 2002: B. Sc. in Mathematics, Vinh University, Vietnam
With Highest Honor of the Graduation Class

Employment

- September 2014 – present: Lecturer, Department of Mathematics, Mechanics, and Informatics, VNU Hanoi University of Science
- August 2012 – May 2014: Visiting Assistant Professor, Department of Mathematical Sciences, Loyola University New Orleans, USA
- August 2005 – August 2012: Graduate Teaching Assistant, Department of Mathematical Sciences, New Mexico State University, USA (NMSU)
- July 2002 – August 2013: Researcher, Institute of Mathematics, Hanoi, Vietnam

Funding and Awards

- 2005 – 2007: NMSU Tuition Fellowship Award for outstanding new graduate students
- 2006 – 2007: NMSU Outstanding Graduate Assistantship Award

Academic Honor: Second Prize of the Ministry of Education and Training of Vietnam for Students in Scientific Research, 2002

Academic Activities

- Session Chair, *AMS Session on Finite Differences and Functional Equations: Sequences, Series, and Expansion*, Joint Mathematics Meetings, Boston, Massachusetts, USA, Jan 2012
- Young Collaborator, *the Abdus Salam International Centre for Theoretical Physics*, Trieste, Italy, Feb – Mar 2003

Publications and Submitted Work

1. Divergence-free and curl-free multiwavelets on the unit square. *Submitted*
2. Biorthogonal multiwavelets related by differentiation. *International Journal of Wavelets, Multiresolution and Information Processing* **12:2** (2014), 34 pages.
3. (With Joseph Lakey) Divergence-free multiwavelets on the half plane. *Axioms* **2:2** (2013), 100-121.

(With Le Xuan Son) Probabilistic iterated function system and probabilistic system. *Vietnam Journal of Mathematics* **31:2** (2003), 207-216.

Curriculum Vitae

Tat Dat Tran
Max Planck Institute for Mathematics in the Sciences
Inselstrasse 22, 04103 Leipzig, Germany

Education

Undergraduate thesis

title *Neutral differential equations with piecewise constant arguments*
supervisors Professor Minh Van Nguyen
graduation June 2004

Master thesis

title *On the almost automorphy of bounded solutions to differential equations with piecewise constant arguments*
supervisors Professor Minh Van Nguyen
graduation June 2006

Doctor thesis

title *Information geometry and the Wright-Fisher model of mathematical population genetics*
supervisors Professor Juergen Jost
graduation July 2012

Employment record

2012– **Postdoctoral researcher**, *Max Planck Institute for Mathematics in the Sciences*, Leipzig.
2011–2012 **Research assistant**, *Max Planck Institute for Mathematics in the Sciences*, Leipzig.
2007–2011 **IMPRS PhD Fellowship**, *Max Planck Institute for Mathematics in the Sciences*, Leipzig.
2004–2007 **Teaching assistant**, *Hanoi University of Sciences, Vietnam National University*, Hanoi.

Other Awards

2004 First prize at Scientific Research for Students of Faculty of Mathematics, Mechanics, and Informatics, Hanoi, Vietnam 2004
First prize at Scientific Research for Students of Hanoi University of Science, Vietnam
2004 2002 Third prize of Analysis at National Mathematical Student Olympiad

Selected publications

2016 (with J. Hofrichter, J. Jost) Lecture Notes: *Information geometry and population genetics*.
2016 (with J. Hofrichter, J. Jost) *The uniqueness of hierarchically extended backward solutions of the Wright-Fisher model*, Communications in Partial Differential Equations 41(3) (2016) 447-483.
2016 (with J. Hofrichter, J. Jost) *A hierarchical extension scheme for backward solutions of the Wright-Fisher model*, Communications in Mathematical Sciences, **14**(4) (2016) 1093-1110.
2016 (with J. Hofrichter, J. Jost) *A general solution of the Wright-Fisher model of random genetic drift*, Differential Equations and Dynamical Systems (2016) 1-26.

2015 (with J. Hofrichter, J. Jost) *The free energy method and the Wright-Fisher model with 2 alleles*, Theory in Biosciences **134**(3) (2015) 83-92.

2014 (with J. Hofrichter, J. Jost) *The evolution of moment generating functions for the Wright-Fisher model of population genetics*, Mathematical Biosciences **256** (2014) 10-17.

2013 (with J. Hofrichter, J. Jost) *An introduction to the mathematical structure of the Wright-Fisher model of population genetics*, Theory in Biosciences, **13**(2) (2013), 73-82.

2007 (with V. M. Nguyen) *On the almost automorphy of bounded solutions of differential equations with piecewise constant argument*, J. Math. Anal. Appl., **326** (2007), 165-178.

2006 (with Q. A. Ngo, D. T. Du, and A. T. Dang) *Notes on an Integral Inequality*, J. Inequal. Pure and Appl. Math., vol. **7**, no. **4**, p. 121, 2006.

2005 *On the existence of almost periodic, periodic and quasi-periodic solutions of neutral differential equations with piecewise constant arguments*, Intern. J. of Evolution Equations, **1**(2) (2005), 121-135.

Selected recent Talks

2016 Invited Talk at International Workshop on Statistical Mechanics and Information in Evolution, Ludwig Maximillians University, Munich, Germany (July 4-6, 2016)

2016 Poster section at Information Geometry and its Applications IV, Liblice, Czech Republic (June 12-17, 2016)

2016 Invited Talk at Berlin-Leipzig workshop in analysis and stochastics (April 13-15, 2016)

2015 Invited Talk: Review colloquium SPP 1590: Probabilistic structures in Evolution, Bielefeld (September 3-4, 2015)

2015 Contributed Talk at Workshop on Mathematical Trends in Reaction Network Theory, July 1-3, 2015 in Copenhagen

2015 Invited Talk: Max Planck Institute for Evolutionary Biology, Ploen (June 3-5, 2015)

2015 Contributed Talk at International conference: Modelling Biological Evolution
2015 Linking Mathematical Theories with Empirical Realities, combined with the LMS workshop: Mathematical and Computational Models in Evolutionary Biology: Shifting the Existing Paradigms (University of Leicester (UK), April 28 - May 1, 2015)

2014 Contributed Talk at The 9th European Conference on Mathematical and Theoretical Biology, Gothenburg, Sweden (June 15-19, 2014)

2013 Contributed Talk at The 8th Vietnamese Mathematical Conference, Nha Trang, Vietnam (August 10-14, 2013)

Service

Journal Referee: Numerical Methods for Partial Differential Equations, Journal of Theoretical Biology, SIAM Journal on Applied Mathematics (SIAP).

CURRICULUM VITAE

PERSONAL DETAILS

Full name: Nguyen Trong Hieu

Date of birth: May 13, 1982

Sex: Male

Place of birth: Hanoi, Vietnam

Nationality: Vietnamese

Present Position:

Lecturer of Faculty of Mathematics, Mechanics and Informatics,
Hanoi University of Science, Vietnam National University, Hanoi.

Official Address:

Department of Mathematical Modeling in Ecology and
Environment, Faculty of Mathematics - Mechanics - Informatics,
Hanoi University of Science, 334 Nguyen Trai street, Thanh Xuan,
Hanoi, Vietnam.

Telephone: (+84) 4.38581135

Fax: (+84) 4.38588817

Email: hieunguyentrong@gmail.com,

EDUCATION

PhD Mathematics

Pierre and Marie Curie University - Paris 6 University (2014)

Thesis title: "Mathematical population dynamics models in
deterministic and stochastic environments"

M.Sc Mathematics

Hanoi University of Science (2006)

B.Sc Applied Mathematics and Informatics

Hanoi University of Science (2004).

RESEARCH INTERESTS

- Dynamical systems, random dynamic systems and their applications in biology.
- Biomathematics, population dynamic, mathematical models in ecology, environment and epidemic.
- Informatics, modelling and simulations of ecological systems

WORK EXPERIENCE

- Lecturer of Department of Biomathematics and Environment, Faculty of Mathematics, Mechanics and Informatics, Hanoi University of Science, Vietnam National University, Hanoi (2004 – 2010)
- Affiliate member in International Centre for Theoretical Physics, Trieste, Italia (6/2008 – 8/2008)
- Work in “Unité de modélisation mathématique et informatique des Systèmes Complexes”, IRD, France.
- Collaborate with research group in biomathematical of Prof Yasuhiro Takeuchi (Japan) and Prof Nguyen Huu Du (Vietnam), group in ecological modelling of Prof Pierre Auger (France).
- Participate in three national projects.

PUBLICATIONS

- N.T.Hieu, N.H.Du, P.Auger, N.H.Dang, (2015) “Dynamical behavior of a stochastic SIRS epidemic model”, *Mathematical Modelling of Natural Phenomena*, 10(2), pp. 56-73.
- Trong Hieu Nguyen, Doanh Nguyen-Ngoc, (2015) “Spatial heterogeneity, fast migration and coexistence of intraguild predation dynamics”, *Journal of Biological Systems*, 23(1), pp 79-92.
- Nguyen Trong Hieu, Timothee Brochier, Nguyen-Huu Tri, Pierre Auger, Patrice Brehmer, (2014) “Effect of small versus large clusters of fish school on the yield of a purse-seine small pelagic fishery including a marine protected area”, *Acta Biotheoretica*, 62(3), pp. 339-353.
- Ta Viet Ton, Nguyen Trong Hieu, (2011) “Dynamics of species in a model with two predators and one prey”, *Nonlinear Analysis*, 74, pp.4868-4881.
- P. Auger, N.H. Du, N.T. Hieu, (2009) “Evolution of Lotka-Volterra predator-prey systems under telegraph noise”, *Mathematical Biosciences and Engineering*, 6(4), pp. 683-700.
- Y. Takeuchi, N.H. Du, N.T. Hieu, K.Sato, (2006) “Evolution of Predator-Prey Systems Described By a Lotka-Volterra Equation Under Random Environment”, *Journal of Mathematical Analysis and Applications*, 323, pp.938-957.