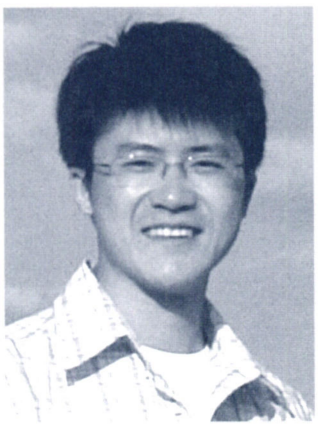
Singapore Mathematical Society
Events and Activities 2016

1. SMS Lecture Series

- This annual lecture series, which is traditionally organized in conjunction with the Annual General Meeting of the Singapore Mathematical Society, features eminent local mathematicians or mathematics educators to share with the public some of their interests and ideas.

- Date: March 9, 2016
  Venue: LT31, National University of Singapore
  Title: **An Introduction to Algorithmic Game Theory**



- Speaker: A/Prof Chen Ning
  - Dr. Chen Ning is an Associate Professor at Nanyang Technological University. He got his PhD from University of Washington and is an expert on Theoretical Computer Science and Algorithmic Game Theory. He is also an entrepreneur and has founded two startups.

- **Abstract:** With the development of the Internet and its growing impact on every walk of life, a variety of new mathematical and computational models that involve human behaviour have been established. We will introduce the rapidly developing field Algorithmic Game Theory that combines incentive analysis in game theory with efficient computational tools of mathematics and computer science.

2. Singapore Mathematics Symposium

The 7th Singapore Mathematics Symposium was held on 30th September 2016 at the Institute of Mathematical Sciences, NUS. The half day event included four invited lectures by mathematicians from NTU and NUS. In his talk entitled Multilevel Sequential Monte Carlo Samplers, Professor Ajay Jasra (NUS) spoke on how the Multilevel Sequential Monte Carlo can be used to reduce the amount of computational effort to estimate expectations. In the second talk *Fekete points and Beta ensembles on a complex manifold*, Professor Dinh Tien Cuong (NUS) introduced Fekete points and mentioned a recent result of Berman, Boucksom and Witt Nystrom which implies that Fekete configurations are asymptotically equidistributed. In his talk, Prof Dinh gave an explicit estimate for the speed of convergence. In the third lecture *Stochastic Partial Differential Equations and Uncertainty Quantification,* Professor Hoang Viet Ha (NTU) presented his recent research on the (quasi-) best N term approximation of the generalized polynomial chaos expansion of the solution. The method achieves a prescribed level of accuracy with optimal complexity. In the final lecture *Spaced Seed Technique for DNA Sequence Comparison*, Professor Zhang Louxin (NUS) spoke on the space seed technique for DNA sequence comparison. He showed why this method is powerful using some simple mathematical facts.

In addition to the four invited lectures, graduate students from NTU and NUS also took part in a poster exhibition and competition.

- Date: September 30, 2016
  Venue: Institute of Mathematical Sciences, NUS

3. Singapore Mathematical Olympiad 2016

- Dates:
  May 31, 2016 (Junior and Senior section - First round)
  June 1, 2016 (Open section - First round)
  June 25, 2016 (Junior and Senior section - Second round)
  July 2, 2016 (Open section - Second round)

- The Society conducted the Singapore Mathematical Olympiad (Junior, Senior and Open Sections) in May/June 2016. A total of 7959 students from 120 schools participated in the various sections of the Olympiad.

- For Junior section, there are 3808 participants from 100 schools. For Senior section, there are 2562 participants from 95 schools. For Open section, there are 1589 participants from 70 schools. In addition, there were 98 participants from Malaysia, Indonesia and Vietnam.

- The SMO Subcommittee 2016 consists of
  - Associate Professor Victor Tan (Chairman)
  - Dr Hang Kim Hoo (Deputy Chairman/Administration)
  - Dr Toh Pee Choon (Junior Section Coordinator)
  - Dr Ku Cheng Yeaw (Senior Section Coordinator)
  - Associate Professor Toh Tin Lam (Open Section Coordinator)
  - Associate Professor Tay Tiong Seng (Second Round Coordinator)

- The top 10 ranking for the SMO 2016 individual awards is given below:

	Junior Section		**Senior Section**		**Open Section**
1	Boo Tse Yang Lucas (RI)	1	Joel Tan Junyao (NUSHS)	1	Glen Lim Wei An (RI)
2	Ang Boon Han Nathaniel (ACS (I))	2	Khor Jun Wei (RI)	1	Sheldon Kieren Tan (RI)
3	Low Choo Ray (RI)	3	Lee Ker Yang (RI)	3	Liu Yijia (RI)
4	Ho Ki Xiong Timothy (NUSHS)	4	Gabriel Goh Kheng Lin (NUSHS)	4	Bryan Wang Peng Jun (HCI)
5	Ng Yangyi Aloysius (RI)	5	Zhang Xiaorui (NUSHS)	5	Lim Li (NUSHS)
6	Tan Xu Chen (RI)	6	Wang Jianzhi (RI)	6	Joel Tan Junyao (NUSHS)
7	Tan Wee Kean (RI)	7	Daniel Leong Zhi Ming (NUSHS)	7	Tan Likai (RI)
8	Leong Eu-Shaun (RI)	8	Li Chenxu (RI)	8	Clarence Chew Xuan Da (NUSH)
9	David Toh Hui Kai (RI)	9	Cheng Puhua (RI)	9	Lee Ker Yang (RI)
9	Keane Ng (RI)	10	Dai Xiang Rong (RI)	10	Lyu Liang (HCI)

- The SMO 2016 School Awards for Category 1 and 2 are given below:

Category 1	
Gold Award	Silver Award
Anglo-Chinese School (Independent)	Dunman High School
Hwa Chong Institution	Maris Stella High School
Nanyang Girls' High School	River Valley High School
NUS High School of Mathematics and Science	St Joseph's Institution
Raffles Girls' School (Secondary)	Victoria School
Raffles Institution	
Bronze Award	
Anderson Secondary School	Nan Chiau High School
Catholic High School	Nan Hua High School
Cedar Girls' Secondary School	National Junior College
CHIJ St Nicholas Girls' School	Ngee Ann Secondary School
Chung Cheng High School (Main)	Singapore Chinese Girls' School
	Tanjong Katong Secondary School
Commendation Award	
Ang Mo Kio Secondary School	Kranji Secondary School
Anglican High School	Methodist Girls' School
Bukit Batok Secondary School	NPS International School, Singapore
Bukit Panjang Govt High School	Paya Lebar Methodist Girls' School
Bukit View Secondary School	School of the Arts, Singapore
Clementi Town Secondary School	St Andrew's Secondary School
Crescent Girls' School	Swiss Cottage Secondary School
Dunman Secondary School	Tanjong Katong Girls' School
Evergreen Secondary School	Temasek Junior College
Fairfield Methodist Secondary School	Temasek Secondary School
Fuhua Secondary School	Unity Secondary School
Gan Eng Seng Secondary School	Xinmin Secondary School
Jurong Secondary School	Zhonghua Secondary School

Category 2	
Gold Award	Silver Award
Hwa Chong Institution	Anglo-Chinese School (Independent)
Raffles Institution	NUS High School of Mathematics and Science
	Victoria Junior College
Bronze Award	
Dunman High School	Temasek Junior College
National Junior College	
Commendation Award	
Anderson Junior College	Nanyang Junior College
Anderson Secondary School	River Valley High School
Anglo-Chinese Junior College	St Andrew's Junior College
Nanyang Girls' High School	St Joseph's Institution

4. Singapore Mathematics Projects Festival 2016.

- Dates:
  February 13 2016 (Preliminary round A)
  February 20 2016 (Preliminary round B)
  March 19 2016 (Festival Congress – Final round)

- This year the Project Festival attracted 14 projects from Junior section and 26 projects from Senior section.

- The preliminary rounds were held at various locations, including NUS, Catholic High School, Hwa Chong Institution. Judging panels made up of Mathematicians and school teachers were formed to grade the presentation of each team.

- 5 teams from the Junior section and 5 teams from Senior Section were invited to the Festival Congress held at NUS High School of Mathematics and Science

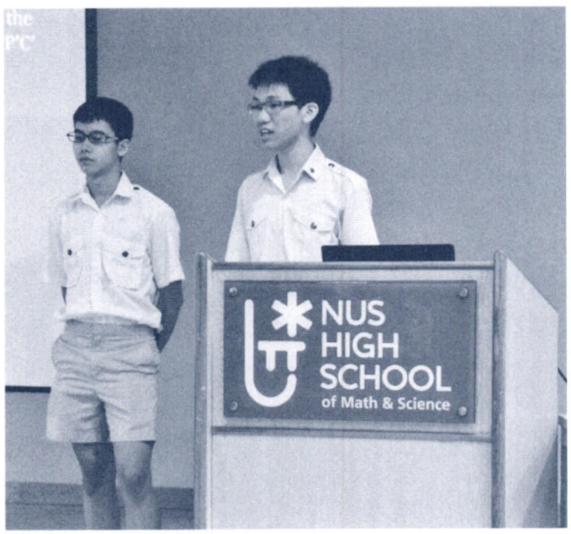
- The judges for the Festival were
  - Junior Section: Dr Teo Kok Ming, Assoc Prof Zhao Dong Sheng, Dr Toh Pee Choon (NIE)
  - Senior Section: Dr Ku Cheng Yeaw, Assoc Prof Tay Tiong Seng, Dr Wang Fei (NUS)

- Medals were awarded to the following projects:

Junior Section

  - Gold (Foo Kean Pew Memorial Prize): **A Hexagon Cutting Problem and Its Generalisations**, by Joel Tan, Matthew Chia, Daniel Leong (NUS High School of Ma thematics and Science)

  - Gold: **Minimum Distance Problem**, by Aung Kaung Kaung, Lim An Jun, Ng Yu Peng (Hwa Chong Institution)



  - Silver: **Pirate Game**, by Li Yue Lin, Sivakumar Varun, Zachary Michael Koh (NUS High School of Mathematics and Science)
  - Silver: **The Light Out Puzzle**, by Teow Hua Jun, Chai Yi Chen, Zhu Qien, Tan Zi Yi (Hwa Chong Institution)
  - Bronze: **Birthday Paradox**, Tay Fu Wen, Andrew Yapp (NUS High School of Mathematics and Science)

Senior Section

- Gold (Foo Kean Pew Memorial Prize): **Evaluation of an Improper Integral**, by Soh Jing Ren (NUS High School of Mathematics and Science)

- Silver: **Triangling a Triangle**, by Bryan Wang Peng Jun, Winfred Kong (Hwa Chong Institution)
- Silver: **Caustic Envelope**, by Poon Zong Wei Julian, Tan Zi Hao, Toh Yi Sheng Eusebius (Catholic High School)
- Bronze: **Exploring the Secretary Problem**, by Ivan Feng Jun Kai, Gao Chang Xiang, Ng Wei En (Victoria School)
- Bronze: **Brachistochrone,** by Kwang Hao Yang, William Kin, Low Shi Ming (Hwa Chong Institution)
- Bronze: **A Real Variable Method for Summing Certain Trigonometric Series**, by Chong Jing Quan, Huang Xing Chen, Li Jingtao (NUS High School of mathematics and Science)
- Bronze: **MIB: Math in Basketball**, by Mao Ziming, Cheng Dongyan, Zhang Shukai (Hwa Chong Institution)
- Bronze: **Flex the Hexahexaflexagon!**, By Darrell Goh Rui Jie, Tan Yan Wen (Hwa Chong Institution)

5. Annual Prize Presentation Ceremony

- Date: September 03 2016
  Venue: NUS High School of Mathematics and Sciences
  Guest of Honour: **Mr. Wong Siew Hoong** (Director-General of Education)
  Prize presentation is officiated by Mr. Wong and SMS Vice President Dr Hang Kim Hoo

- The following prizes were given out at the ceremony:
  - 14 prizes for the Singapore Mathematics Project Festival (Junior Section)
  - 14 prizes for the Singapore Mathematics Project Festival (Senior Section)
  - 30 individual prizes for the Singapore Mathematical Olympiad (Junior section)
  - 31 individual prizes for the Singapore Mathematical Olympiad (Senior section)
  - 30 individual prizes for the Singapore Mathematical Olympiad (Open section)
  - 48 School Awards for the Singapore Mathematical Olympiad (Category 1)
  - 16 School Awards for the Singapore Mathematical Olympiad (Category 2)
  - Awards to the Singapore Team to the 57th International Mathematical Olympiad

6. Mathematics Teacher Conference 2016

Almost 700 participants, mostly local mathematics teachers, attended the Mathematics Teachers Conference 2016 which took place on 2 June 2016 at the National Institute of Education (NIE). The event was co-organized by the Mathematics & Mathematics Education Academic Group of NIE and the Association of Mathematics Educators, and supported by SMS. Several SMS members were invited to deliver lectures and workshops for the teachers.

- **Dr Toh Pee Choon**
  Keynote Lecture: **Discovering Mathematics**

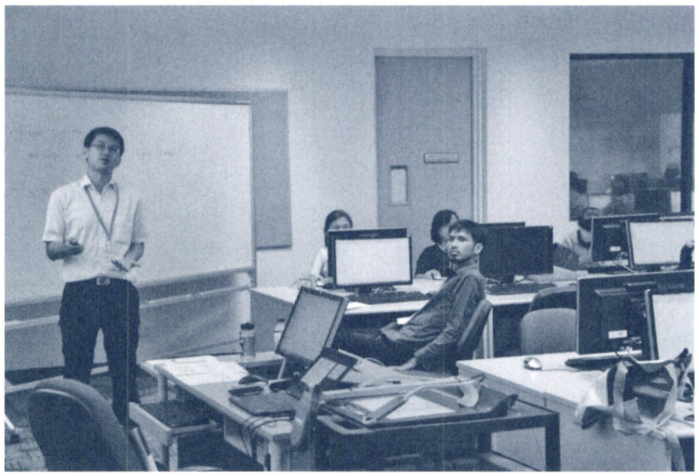
Abstract: What is mathematics? If you ask students, the majority of their answers would invariably revolve around calculations, formulas and possibly the fact that every problem has a definite numerical answer. A mathematician on the other hand would describe mathematics as a process of discovery, a search for structure, which involves exploring, experimenting, conjecturing and reasoning. Often times, the problems to be solved are not well defined, let alone the answers. In this lecture, we will explore how to bridge the gap between the students' and the mathematicians' experiences of doing mathematics.

- **Dr Gwee Hwee Ngee**
  Workshop: **Mentoring Mathematics Projects**

Abstract: In this workshop, the presenter will share her experience on mentoring and nurturing students from posing a Mathematics problem to the completion of Mathematics Projects. She will also share ideas, resources and websites on how to develop a Mathematics Project.

- **Dr Hang Kim Hoo**
  Workshop: Integrating Mathematical Reasoning in Learning Advanced Mathematics

  Abstract: The re-introduction of Further Mathematics at the A-Levels in 2016 is a positive development in providing better opportunities for interested or talented students to learn, do and use mathematics more deeply. This workshop hopes to provide participants an insight into an enhanced approach where students learn advanced mathematics (i) through the scaffolding and integration of mathematical thinking processes, and (ii) in tandem with the professional development in mathematical discourse for the mathematics teachers involved. It is hoped that the learning and experiences acquired will provide further impetus to the development of new ways of learning and teaching of Mathematics beyond the current lecture and tutorial system at the junior colleges.



- **Dr Toh Pee Choon**
  Workshop: **Discovering Conics with GeoGebra**

  Abstract: The aim of this workshop is to investigate some geometric properties of various conic sections through the use of the dynamic geometry software GeoGebra. Activities suitable for H2 Further Mathematics students will be introduced.

- **Dr Toh Tin Lam**
  Workshop: **Problem Solving as a Way of Empowering our Students**

  Abstract: This workshop introduces the rationale of how problem solving can be used in the school mathematics classrooms to empower our students in acquisition of mathematical knowledge. The participants will be introduced to different approaches of teaching mathematics in the secondary school mathematics classrooms through problem solving coupled with technology and visual aids.