Mathematics Enrichment Camp 2012

Date: Saturday, 25 August 2012

Time: 9.00 am to 2.00 pm

Venue: Lecture Theatre 25
         Faculty of Science, National University of Singapore

Registration Open!

Organized by

NUS
National University
of Singapore

Department of Mathematics

Programme

Time	Activity
8.30am	**Registration**
9.00am	**Welcome Address** By Professor Shen Zuowei Head, Department of Mathematics
9.05am	**About the Department of Mathematics** By Associate Professor Leung Ka Hin
9.15am	**Once upon a fascinating problem …** By Professor Louis H Y Chen
10.00am	**Option pricing is not optional** By Associate Professor Dai Min
10.45am	Tea Break
11.15am	**Mathematical methods for visual information processing** By Associate Professor Ji Hui
12.00pm	**Symmetries in mathematics and physics** By Dr Graeme Wilkin
12.45pm	Lunch

End of Programme

Abstracts

Once upon a fascinating problem …
By Professor Louis H Y Chen

Back in the 1950s and 1960s when I was still a student, I came across a number of mathematical problems whose solutions fascinated and have never ceased to fascinate me. I would like to share this fascination with you by presenting four of these problems and their solutions.

About the Speaker

Professor Louis Chen received his PhD from Stanford University in 1971. He is Tan Chin Tuan Centennial Professor and Director of the Institute for Mathematical Sciences at the National University of Singapore. He was President of the Bernoulli Society for Mathematical Statistics and Probability in 1997-1999 and President of the Institute of Mathematical Statistics in 2004-2005. He was elected Fellow of the Academy of Sciences for the Developing World in 2000 and Fellow of the Singapore National Academy of Science in 2011. His research interests are in probability theory and computational biology

Option pricing is not optional
By Associate Professor Dai Min

An option is a right to buy or sell the underlying asset by a certain date for a predetermined price. I will give a brief introduction to the art of option pricing.

About the Speaker

Associate Professor Dai Min received his Ph.D. degree from Fudan University in 2000. He worked as a post-doc, lecturer, associate professor at Peking University for four years after his graduation. He joined the Department of Mathematics, NUS, in July 2004, and was promoted to Associate Professor in Jan 2010. His research focuses on mathematical finance, particularly on option pricing and optimal investment with market imperfections. Currently he serves on the Editorial Board of Journal of Economic Dynamics and Control.

Mathematical methods for visual information processing
By Associate Professor Ji Hui

In recent years, there have been great processes on the development of innovative mathematical concepts and new mathematical methods for solving many challenging problems in visual information processing. In this talk, I will first introduce several state-of-art mathematical theories and numerical methods including wavelet, tight frame, sparse approximation and L1 norm related minimization. Then, I will demonstrate how these mathematical tools can be used to solve challenging real-life problems in image restoration and computer vision, including image deblurring, image denoising, image and video in painting and visual tracking.

About the Speaker

Associate Professor Ji Hui got his Bachelor and M.Sc degree in Mathematics from Nanjing University and National University of Singapore respectively; and got his M.Sc and Ph.D degree in Computer Science from University of Maryland, USA with majoring in computer vision. Since 2006, he has been an Assistant Professor in Department of Mathematics at National University of Singapore and affiliated with Center for wavelets, Approx. and Info. Proc. His research interests lies in biological & computer vision, mathematical imaging; computational harmonic analysis and large-scale optimization.

More information can be found in his website:
http://www.math.nus.edu.sg/~matjh

Symmetries in mathematics and physics
## By Dr Graeme Wilkin

Symmetries are useful in helping us to use mathematics to understand the physical world. For example, translational symmetry leads to the law of conservation of linear momentum, and rotational symmetry leads to the law of conservation of angular momentum. In this talk I will give some examples of symmetries and how the equations that describe them lead to many interesting results in geometry and physics.

About the Speaker

Dr Graeme Wilkin completed his undergraduate studies at the University of Melbourne and received his Ph.D degree from Brown University in 2006. From 2006-2009, he was a J.J. Sylvester Assistant Professor in the Department of Mathematics at Johns Hopkins University and from 2009-2011 he was a Burnett Meyer Postdoctoral Instructor at the University of Colorado, Boulder. He joined the Department of Mathematics at National University of Singapore in 2011 as an Assistant Professor. His research interests include Gauge Theory and Differential Geometry.

Getting to the Camp

1. Take the MRT and alight at Kent Ridge MRT Station.

2. Transfer to Internal Bus Service A1 at the bus-stop.

3. Alight at the bus-stop in front of the Lim Seng Tjoe Lecture Theatre 27 in NUS.

4. Follow the map and walk to Lecture Theatre 25.

5. For an interactive map of NUS, please visit http://www.nus.edu.sg/campusmap/
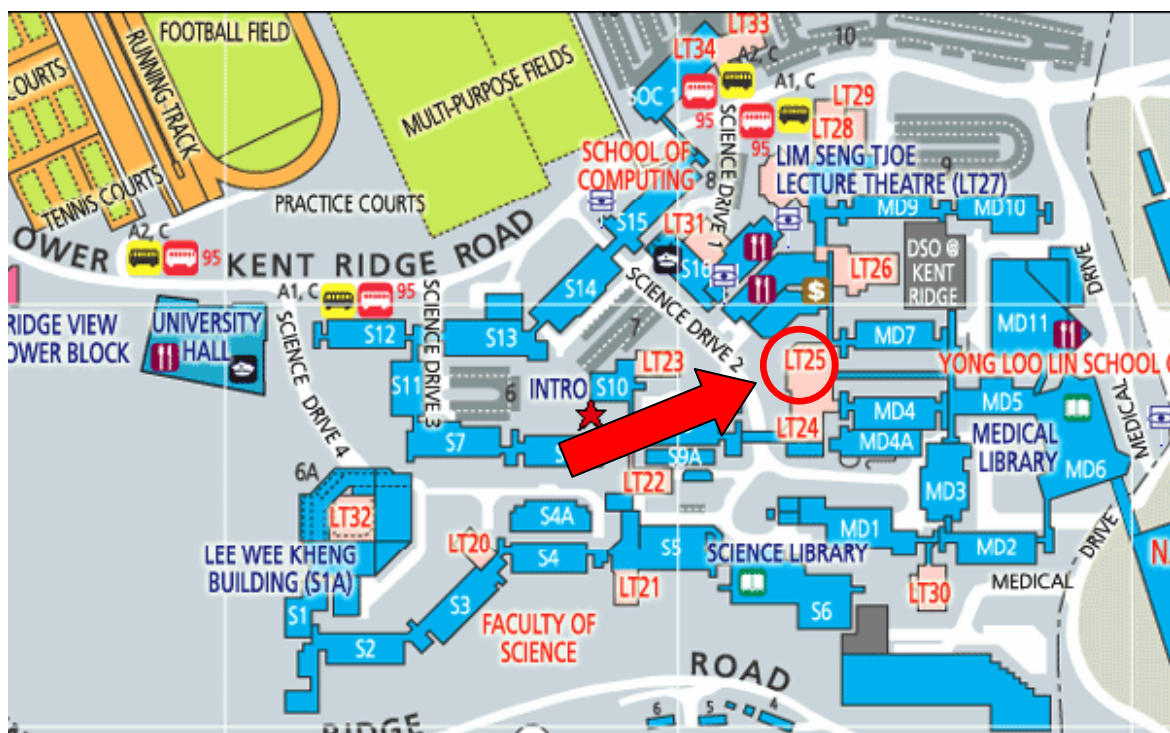
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Registration Instructions

1. The Registration Fee per person is **S$30 (GST inclusive)** and this includes 1 tea break and lunch.

2. Payment is by **cheque only**. Please make cheque payable to **National University of Singapore**.

3. Cancellations are **not refundable** although participants can be substituted.

4. Please send the completed registration form together with the cheque **by Tuesday 31 July 2012 to:**

    > Ms Chan Lai Chee
    > Department of Mathematics
    > Blk S17 Level 4
    > National University of Singapore
    > 10 Lower Kent Ridge Road
    > Singapore 119076

5. For further information, please contact Ms Lynette Wong (6516 8322, matwongl@nus.edu.sg), or Ms Chan Lai Chee (6516 2762, matclc@nus.edu.sg)

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