# An Afternoon of Probability Theory in Honour of Prof Louis Chen

On July 1, 2015, Professor Louis H. Y. Chen will retire from the Department after a long and illustrious career, and will be conferred by NUS the title of Emeritus Professor, in recognition of his distinguished scholarship and outstanding service to the University. In appreciation of his manifold contributions to the Department over the years, the Department will hold a special event "An Afternoon of Probability Theory", followed by an appreciation dinner, on Wednesday, 8 April 2015. The afternoon event will consist of a Colloquium Lecture by SHAO Qi-Man (Chinese University of Hong Kong) entitled "Stein's Method and Riemann Hypothesis", and another talk by XIA Aihua (University of Melbourne) in which he will discuss the Stein-Chen method and give an introduction to the other works of Louis Chen.

**Wednesday, 8 April 2015**

**2.00pm to 4.00pm**

**Department of Mathematics, Seminar Room 1 (#04-06)**

# $\mathcal{P}$rogramme

| Time | Title of Talk / Speaker |
|------|-------------------------|
| 2:00-3:00pm | Stein's Method and Riemann Hypothesis<br>SHAO Qi-Man |
| 3:00-4:00pm | Dependence mining using the Stein-Chen method<br>XIA Aihua |

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### Stein's Method and Riemann Hypothesis
### SHAO Qi-Man
### Department of Statistics, The Chinese University of Hong Kong

In this talk, we review recent developments of non-normal approximation by Stein's method and their possible connections to the Riemann Hypothesis. In particularly, for a given sequence of Ising models, we give a concrete approach to identify the limiting distribution. On the other hand, for a given limiting distribution called $\Psi$, if one can find a sequence of Ising models so that the limiting distribution is $\Psi$, then the Riemann Hypothesis holds. The problem can be reduced to calculate conditional expectations and conditional variances.

### Dependence mining using the Stein-Chen method
### XIA Aihua
### Department of Mathematics and Statistics, The University of Melbourne

The behaviour of random events in space and time is generally intractable. These problems appear in a diverse range of fields such as ecology, complex networks, insurance and population genetics. However, when we have empirical data, we can fit a random phenomenon into a suitable model and then let the time go to infinity to obtain the long-run behaviour of the model. The long-run behaviour is in turn used to approximate the finite time behaviour of the random phenomenon. Due to the dependence of the random events, it is generally impossible to know exactly how much error is created by such approximations. The Stein-Chen method was created by LHY Chen (1975) to mine the dependence and extract some information about the magnitude of error in such approximations. In this talk, I will explain why the Stein-Chen method is needed and how much it achieves comparative to other methods. I will also give an introduction on the other work by Professor LHY Chen.