THE UNIVERSITY   **OF HONG KONG**

Institute of Mathematical Research
Department of Mathematics

C O L L O Q U I U M

Self-Normalized Limit Theorems, Moment Bounds and Exponential Inequalities

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<u>Abstract</u>

Self-normalization arises naturally in practical applications of limit theorems in probability. Being unit-free, self-normalized random variables are not affected by scale changes. A prototypical example is Student's t-statistic. In recent years there has been increasing interest in limit theorems and moment bounds for self-normalized sums of independent, identically distributed random variables, for which self-normalization has been shown to dispense with or considerably weaken the moment conditions required for the classical limit theorems. We first give a brief survey of these results and then develop their extensions to much more general settings, including sums of conditionally symmetric random variables and continuous local martingales, and also derive several new results. In particular, a bounded law of the iterated logarithm is shown to hold for general adapted sequences that are centered at certain truncated conditional expectations and self-normalized by the square root of the sum of squares. A compact law of the iterated logarithm for self-normalized martingales is also given in this connection.

> **Date:**   December 6, 2002 (Friday)
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> **Time:**   2:00 – 3:00pm
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> **Place:**   Room 517, Meng Wah Complex

Tea will be held in Room 516, Meng Wah Complex after the lecture.

All are welcome