國立中山大學應用數學系
學術演講

講　者：Professor James A. Mingo
Queen's University, Canada
時　間：2016/03/03（星期四）
14:10 ~ 15:00, 15:10 ~ 16:00
地　點：理學院四樓理 SC 4009-1 室
茶　會：16:00 於理 SC 4010 室（系辦公室)

Cumulants: Free and Classical

In probability theory the method of moments is frequently used to test for the convergence of a sequence of random variables. Another sequence which serves the same purpose and is frequently easier to work with is the sequence of cumulants. A crucial feature of cumulants is that they work very well with independence. For non-commuting random variables there are other kinds of independence, in particular Voiculescu's free independence. For this theory there are analogues of cumulants called the free cumulants. In the free case the theory of cumulants is much richer and there are higher order versions for which no classical analogue exists. I will explain the construction and use of these higher order versions.

Cumulants of Partially Transposed Random Matrices

In quantum information theory the partial transpose of a positive matrix has been used to detect entanglement. I have recently investigated the effect of partial transposes on asymptotic freeness. The main tool for doing this is the use of free cumulants, both of first and second order. I will show how to use some simple geometric properties to find these cumulants.

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