

國立中山大學應用數學系

學術演講

主講人：廖文欽 教授

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講題：Cranks and dissections in Ramanujan's lost notebook

日期：94 年 03 月 14 日（星期一）16：10～17：00

地點：理學院 4 樓理 4011 室（設備：白板、固定單槍、固定電腦、投影機）

茶會：15：30 於理 4010 室

Abstract

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Ramanujan's famous partition congruences mod 5, 7, 11 have combinatorial interpretations in terms of *crank*, a combinatorial statistics which was originally proposed by F. J. Dyson in 1944 and later discovered in 1987 by G. E. Andrews and F. G. Garvan. These congruences are in fact encoded in some t -dissections of the generating function $F_a(q)$ of vector partitions, where

$$F_a(q) := \prod_{n=1}^{\infty} \frac{1 - q^n}{(1 - aq^n)(1 - a^{-1}q^n)},$$

and $a = \zeta := e^{2\pi i/t}$, $t = 5, 7, 11$. In his lost notebook, Ramanujan offers several congruences in the ring of formal power series for $F_a(q)$. Using an obscure identity found on page 59 of the Lost Notebook, we provide uniform proofs of these congruences. Some new interesting q -series identities in the spirit of Atkin and Swinnerton-Dyer arise as byproducts of our work.

In this talk, we shall discuss the methods used to prove such dissections for small values of t . We shall also discuss Ramanujan's "claims" on the dissections of $F_a(q)$ in his lost notebook and some recent progress of proving them.

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