Dear Dirk,

This is the title and abstract of my talk at Mathematical Physics Seminar on November 2 at 3pm.

Noriko Yui

Title: Quasimodular forms and mirror symmetry for elliptic curves

We look into the formula due to Douglas and Dijkgraaf on the generating function, $F_g(q)$, of the number of simply ramified covers of genus $g \geq 1$ over a fixed elliptic curve. Their result is that $F_g(q)$ is a quasimodular form of weight $6g-6$ on the full modular group $PSL_2(Z)$.

There are two ways of counting $F_g(q)$: the fermionic count and the bosonic count. The fermionic counting is a mathematical treatment. However, the bosonic counting rests on physical arguments, which involves Feynman diagrams (and integrals) on trivalent graphs.

I will report on our attempt to understand this fascinating formula for the generating function $F_g(q)$ from the mathematical point of view.

This is a joint work with Mike Roth (Queen's) and Brendan McLellan (Toronto).