1027-05-35   **David Rhŷs Jackson*** (`dmjackson@math.uwaterloo.ca`), Department of Combinatorics and Optimization, Faculty of Mathematics, University of Waterloo, Waterloo, ON N2L 3G1, Canada. *An approach through combinatorics to intersection number questions for the moduli spaces of curves.*

There are questions in algebraic geometry about intersection numbers for the moduli spaces of curves that contain, perhaps surprisingly, a large amount of combinatorics. These questions include the original conjecture of Hurwitz about the number of ramified covers of the sphere with prescribed ramification over infinity, the λ_g-Conjecture of Getzler and Pandharipande, Witten's Conjecture (Kontsevich's Theorem) and Faber's Conjecture (for the moduli space of smooth curves).

In this talk I shall describe an approach that I have used, with Ian Goulden and Ravi Vakil, that attacks such problems through their encodings as transitive ordered factorisations of permutations into transpositions. At the heart of this approach is the use of localisation to obtain a join-cut equation for the generating series for the intersection numbers, a partial differential equation that we then transform through implicit changes of variables.

I shall concentrate on the combinatorics, and to pick up the account once the algebraic geometry has converted the problems to combinatorial ones. I shall explain the overall approach and will give a few open questions that are essentially combinatorial in nature. (Received January 27, 2007)