IAN GOULDEN, University of Waterloo, Waterloo, Ontario N2T 1R3
Maps, Branched Covers and the KP Hierarchy

Maps in an orientable surface of arbitrary genus and branched covers of the sphere can both be represented by factorizations in the symmetric group, in which the subgroup generated by the factors acts transitively on the underlying symbols (these are called "transitive factorizations"). The generating series for a large class of transitive factorizations satisfies the KP hierarchy. We shall discuss the KP hierarchy and a new algebraic combinatorial proof of the fundamental result that relates Schur function expansions of a series and the Plücker relations. As an application, we give a recurrence for triangulations of a surface of arbitrary genus obtained from the simplest partial differential equation in the KP hierarchy. The recurrence is very simple, but we do not know a combinatorial interpretation of it, yet it leads to precise asymptotics for the number of triangulations with n edges, in a surface of genus g.