Hankel determinants, Coxeter-Toda lattices and cluster algebras

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We explore an interplay between inverse problems for generalized Jacobi matrices and the Poisson geometry of directed networks to construct a cluster algebra structure in the space of rational functions. We then interpret Bäcklund-Darboux transformations between various integrable lattices of Toda type in terms of cluster transformations.

The talk is based on a joint work with M. Shapiro and A. Vainshtein.