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Symplectic groupoid and cluster algebra description of closed Riemann surfaces

We use the Fock--Goncharov higher Teichmuller space directed networks to solve the symplectic groupoid condition: parameterize pairs of SL_n matrices (B,A) with A unipotent such that BAB^T is also unipotent. A natural Lie--Poisson bracket on B generates the Goldman bracket on elements of A and BAB^T , which are simultaneously elements of the corresponding upper cluster algebras. Using this input we identify the space of X -cluster algebra elements with Teichmuller spaces of closed Riemann surfaces of genus 2 (for $n=3$) and 3 (for $n=4$) endowed with Goldman bracket structure: all geodesic functions are positive Laurent polynomials and Dehn twists correspond to mutations in the corresponding quivers. I will discuss possible relations with topological recursion and integrals over moduli spaces.