

Systèmes intégrables, modèles et algèbres exactement solubles
19 septembre – 7 octobre 2022

Integrable systems, exactly solvable models and algebras
September 19 – October 7, 2022

Rei Inoue
(Chiba University)

Cluster algebras and hyperbolic geometry

We introduce an application of cluster algebra to study two and three dimensional hyperbolic geometry.

In two dimension, a mutation corresponds to a flip in ideal triangulations of punctured surfaces, and cluster x -variables give a coordinate for the decorated Teichmuller space of the surface.

In three dimension, a mutation produces an ideal tetrahedron, and cluster y -variables are interpreted as the modulus of ideal tetrahedra.

We define the octahedral braiding operator composed of four mutations, and study the volumes of knots.