
Discrete Analysis Seminar

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Skein relations for punctured surfaces

Following the initial introduction of cluster algebras by Fomin and Zelevinsky in 2002, considerable attention has been focused on cluster algebras of surface type. These particular cluster algebras are of significant interest because they allow for the construction of various combinatorial structures, such as snake graphs, T-paths, and posets, which can be employed to prove key structural properties related to positivity or the existence of bases. In this talk, we start with presenting a cluster expansion formula that combines the work of Musiker, Schiffler, and Williams with contributions from Wilson, utilizing poset representatives for arcs on triangulated surfaces. Then, by utilizing these posets and the expansion formula as tools, we will show skein relations, which are relations employed to resolve intersections or incompatibilities between arcs. Topologically, a skein relation addresses intersecting arcs or an arc with self-intersections by replacing this configuration with two sets of arcs that avoid the intersection in different ways. We will also demonstrate that all skein relations on punctured surfaces contain a term that is not divisible by any coefficient variable. As a result, we will see that the bangles and bracelets form spanning sets and exhibit linear independence. This is a joint work with Esther Banaian and Elizabeth Kelley.

Date: 18th April, 2024

Time: 4:00pm – 5:00pm

Location: 254, Science Building



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