

Oberseminar Geometrie

Department of Mathematics

University of Fribourg

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Cube flips from statistical mechanics to discrete geometry

In various models of statistical mechanics in dimension two, a key property is the existence of a local transformation of the underlying graph and parameters, such that long range properties remain unchanged. This takes the form of a "cube flip" (or star-triangle, or Yang-Baxter equation). On the other hand, there has been recently an intense line of research concerning canonical embeddings of such models (s -embeddings by Chelkak, circle patterns by Kenyon, Lam, Ramassamy and Russkikh, etc). Through this correspondence, cube flips of the model are conjugated to theorems of planar (or projective) geometry on the embedding, and give rise to discrete integrable structures. I will present a few cases of this correspondence. This is based on joint works in progress with Niklas Affolter, Sanjay Ramassamy and Paul Thévenin.