

Skew lattices and set-theoretic solutions of the Yang-Baxter equation

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The Yang-Baxter equation originates from papers by Yang and Baxter on quantum and statistical mechanics, and the search for solutions has attracted numerous studies both in mathematical physics and pure mathematics. As the study of arbitrary solutions is complex, Drinfeld proposed in 1992 to focus on the class of set-theoretic solutions. The goal is simple, find all set-theoretic solutions of the Yang-Baxter equation.

Recently introduced algebraic structures, like braces, cycle sets and their generalizations, are related to special classes of set-theoretic solutions. Still, an algebraic structure that describes all set-theoretic solutions of the Yang-Baxter equation is not known. In this talk, we discuss set-theoretic solutions obtained from skew lattices, an algebraic structure that had not yet been related to the Yang-Baxter equation. Such solutions are degenerate in general, and thus different from solutions obtained from braces and other structures.

This talk is based on joint work with Karin Cvetko-Vah.