The structure of shelves in the study of reflections to set-theoretic solutions of the Yang-Baxter equation

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The *Yang-Baxter equation* (YBE) is a fundamental equation of mathematical physics that has been extensively studied in the last few years. Alongside it, the *reflection equation* serves as a significant tool in the theory of quantum groups and integrable systems, which was first investigated in 1984 by Cherednik. In 2013, Caudrelier, Crampé, and Zhang formulated the set-theoretic version of the YBE, and, later on, some new results were obtained mainly concerning involutive and non-degenerate solutions.

This talk aims to present a strategy for determining reflections to left non-degenerate set-theoretic solutions (X, r) of the YBE as provided in a joint work with A. Albano and M. Mazzotta, and obtained by examining the behaviour of these solutions with their *derived solutions* or, equivalently, with *(left) self-distributive structures* associated with them. Our approach is strongly motivated by a recent description of left non-degenerate solutions (X, r) in terms of *Drinfel'd twist*, namely, a family of automorphisms of the shelf associated with (X, r), which is obtained in a joint paper with A. Doikou and B. Rybołowicz.