

**QUANDLE HOMOLOGY THEORIES, SET-THEORETIC
YANG-BAXTER EQUATIONS, AND TOPOLOGICAL
APPLICATIONS**

J. SCOTT CARTER AND MASAHICO SAITO

Many of the quandle theoretic invariants that are defined for classical knots can be extended to invariants of virtual knots, certain graphs, and knotted surfaces. In this talk we present the method for constructing such invariants. The homology theory of quandles also extends to a more broad context in which the set-theoretic Yang-Baxter equation is involved. In these varied situations, we construct cocycles and state-sum invariants based on colorings. We give applications of these cocycle invariants to non-invertibility, triple point numbers, minimal sheet numbers, and ribbon concordance.

UNIVERSITY OF SOUTH ALABAMA

UNIVERSITY OF SOUTH FLORIDA