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COMBINING QUANDLE COHOMOLOGICAL AND STATE-SUM POLYNOMIAL  
KNOT INVARIANTS

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**Abstract of Poster Presentation:** Our research examines the synergy between separate approaches to generating knot invariants. Namely, cocycle invariants arising from quandle cohomology and state sum polynomials share a strong connection. We demonstrate that the necessary constraints for the creation of a state-sum polynomial for a quandle-colored knot in fact arises directly from the defining equation necessarily satisfied by the relevant cocycle. When specializing to the Takasaki kei, we obtain the construction of a novel class of polynomial invariants for colored knot diagrams. Additionally, the matrix associated to the cocycles operation table forms the backbone of the quandle bracket which encapsulates the states and splittings approach. We further investigate the consequences of employing arbitrary quandles and their more general counterparts to create additional invariants as well as explore the connection between the cohomological knot invariants and knot invariants constructed via skein relations, summing over states, and so on.

[Joint work with Vilas Winstein]

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