

1135-AD-1491      **Patrick D Shanahan\*** (pshanahan@lmu.edu), Loyola Marymount University, Dept. of Mathematics, 1 LMU Dr., Los Angeles, CA 90045, and **Jim Hoste**. *Enumerating cosets, quandles, and coset-quandles.*

In the 1930's, Todd and Coxeter developed a process to enumerate the cosets of a subgroup of a group. This process was a fundamental development in the emerging field of computational group theory. Some 50 years later, Joyce and Matveev independently introduced quandles as a new type of algebraic knot invariant. Shortly thereafter, a graph based Todd-Coxeter like process to enumerate the elements of an  $n$ -quandle of a knot was produced by Winker. In this talk, we will present an enumeration process for the elements of a rack given by a presentation. Since every quandle is a rack, our process generalizes that of Winker. Unlike Winker's method, our approach is modeled after current table-based implementations of the Todd-Coxeter process. Using similar methods to those in computational group theory, we prove that our process terminates if and only if the order of the rack is finite, in which case the procedure outputs an operation table for the rack. We conclude with an application to  $n$ -quandles of knots and discuss the relationship between the  $n$ -quandle of the knot and the coset-quandle of the peripheral subgroup. This project is joint work with Jim Hoste of Pitzer College and was, in part, motivated by the undergraduate senior thesis of Sarah Yoseph. (Received September 22, 2017)