1059-57-50 **Jozef H. Przytycki*** (przytyck@gwu.edu), Department of Mathematics, George Washington University, Washington, DC 20057. *Quandles and their Homology.*

Quandles are algebraic structures introduced by David Joyce in his 1979 Ph.D. thesis as a powerful tool for classifying knots (They also were introduced, independently, by S. Matveev). Even earlier, in 1942 Mituhisa Takasaki introduced an algebraic structure he called Kei (in Joyce terminology – involutive quandle). The main example Takasaki was considering was obtained from an abelian group G by defining the binary operation $*$ by $a * b = 2a - b$. We call such a quandle a Takasaki quandle. Rack homology (of racks and quandles) were first defined and studied by Fenn-Rourke-Sanderson in 1995, and a modification to quandle homology theory was given by Carter-Kamada-Saito. We survey in this talk various method of computng homology of quandles. In particular, we discuss the conjecture that for a finite quandle X which is a quasigroup (i.e.$a * x = c$ has the unique solution) the torsion of its homology is annihilated by $|X|$. (Quasigroup condition is needed as there is 6-element connected quandle whose torsion is not annihilated by 6). Another result which will be discussed is my theorem with M.Niebrzydowski that $H_2^Q(R_{4k}) = Z_2^2 \oplus Z^2$, where R_{4k} is the Takasaki quandle of the cyclic group Z_{4k} (i.e. dihedral quandle). (Received February 10, 2010)