

**Meeting:** 999, Nashville, Tennessee, SS 4A, Special Session on Universal Algebra and Lattice Theory

999-08-88            **Matt Valeriote\*** (valeriot@mcmaster.ca), Department of Mathematics & Statistics, 1280 Main Street West, Hamilton, Ontario L8S 4K1, Canada. *The Constraint Satisfaction Problem and Universal Algebra.*

An instance of the Constraint Satisfaction Problem (CSP) consists of a finite domain  $A$ , a finite set of variables  $V$  and a finite set of constraints of the form  $\langle \vec{s}, R \rangle$  where  $\vec{s}$  is a finite sequence of elements from  $V$  and  $R$  is an  $|\vec{s}|$ -ary relation over  $A$ . A solution of the instance is a function  $f$  from  $V$  to  $A$  such that for each constraint  $\langle \vec{s}, R \rangle$ ,  $f(\vec{s}) \in R$ .

In general, CSPs form an NP-complete class, but if one restricts the type of relations that can appear in the constraints, it is possible to obtain tractable classes of the CSP. A central problem is to determine those sets of relations for which the class of corresponding CSPs is tractable.

In my talk I will present an approach to solving this problem via universal algebra that has been developed by Bulatov, Jeavons, Krokhin and others. In addition, I will report on recent work with Emil Kiss on the special case of finite algebras that generate congruence distributive equational classes. (Received August 12, 2004)