

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

999-08-192            **John W Snow\*** (jsnow@shsu.edu), Department of Mathematics and Statistics, Sam Houston State University, Box 2206, Huntsville, TX 77341-2206. *Relations on Algebras*.

A compatible relation on an algebra is a subuniverse of a direct power of the algebra. The system of all compatible relations of a finite algebra can be characterized in a number of ways employing primitive positive formulas or operations such as projections, products, and intersections.

Let  $R$  be a set of relations on a finite set  $A$ . The characterizations above are useful for addressing such questions as:

If  $R$  consists of equivalence relations, then under what conditions is there an algebra with universe  $A$  whose congruences are precisely the relations in  $R$ ? Or

If  $R$  consists of binary relations, then under what conditions is there an algebra with universe  $A$  whose binary compatible relations are precisely the relations in  $R$ ? Or more generally

If all of the relations in  $R$  satisfy some property  $P$ , then under what conditions is there an algebra with universe  $A$  whose compatible relations satisfying  $P$  are precisely the relations in  $R$ ?

We will survey some results answering problems such as these for various properties  $P$ . (Received August 23, 2004)