1073-57-1 **Tim Cochran** and **Shelly Harvey***, Department of Mathematics, MS #136, Rice University, 6100 Main St., Houston, TX 77005, and **Peter Horn**. *4-Dimensional Equivalence Relations on Knots.*

A knot is an embedded circle in $\mathbb{R}^3$. It is slice if it is the intersection of a 2-dimensional sphere in $\mathbb{R}^4$ with the standard $\mathbb{R}^3 \subset \mathbb{R}^4$. Initially, it was thought that all knots were slice. In the 60's, Murasugi and Fox-Milnor proved that many knots are not slice. Using the notion of sliceness, one can define an equivalence relation on knots called concordance. Moreover, the set of equivalence classes of knots forms an abelian group called the knot concordance group. This group plays an important role in the study of 3- and 4-dimensional manifolds. In this talk, we will give a historical overview of knot concordance and also describe some of our new work on the knot concordance group as described below.

We will define a new filtration of the knot concordance group, called the n-positive filtration. This is a refinement of the n-solvable filtration defined by Cochran-Orr-Teichner in the late 90's. We show that, unlike the n-solvable filtration, the n-positive filtration restricts to give a non-trivial filtration on an important subgroup of the knot concordance group called the group of topologically slice knots. The methods we use are Heegaard-Floer $d$-invariants and Casson-Gordon signature invariants. (Received July 27, 2011)