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Tim D Cochran* (cochran@rice.edu), MS-136 Math. department, PO Box 1892, Houston, TX 77251-1892. *Knots, 4-dimensions and fractals.*

A knot is an embedded circle in \mathbb{R}^3 . It is called a *slice knot* if it is the intersection of an embedded S^2 in \mathbb{R}^4 with $\mathbb{R}^3 \subset \mathbb{R}^4$. Using this notion, one can define an equivalence relation on knots called *concordance*. Moreover, the set of equivalence classes 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 new work as described below.

We will define a new filtration of the knot concordance group (joint with Harvey and Horn), called the *bipolar filtration*. This is a refinement of the *solvable filtration* defined by Cochran-Orr-Teichner in the late 90's. Unlike the solvable filtration, the bipolar filtration restricts to give a non-trivial filtration on an important subgroup of the knot concordance group called the group of *topologically slice* knots.

Finally, we discuss how this group of concordance classes can be viewed as a *fractal space*. (Received September 03, 2012)