MONDAY, AUGUST 11

All talks on Monday will be in *Eckhart 206*. Lunch and Tea will be in the tea room.

11:15 am: Parametrizing the Global Attractor of the Dynamical System Generated by the Navier-Stokes Equations (Will Abram). The Navier-Stokes equations are partial differential equations that are used to model fluid dynamics. I will show that the global attractor of the infinite-dimensional dynamical system generated by the Navier-Stokes equations can be parametrized by finitely many parameters, and thus that fluid flow can be described asymptotically with finitely many degrees of freedom.

12:00pm: Lunch.

1:00pm: Enumeration of the Homotopy Classes of Finite T_0 Spaces (Stephen Patrias and Alex Fix). In this we describe an efficient method for computing pairwise non-homotopic T_0 topological spaces as well as a computer implementation of this method. In addition to the numbers of homotopy classes from this program, we also give the asymptotic enumeration of these classes.

2:30pm: Introducing the Yoneda Lemma (Emily Riehl). We will provide a leisurely introduction to what is arguably the most useful result in category theory: the Yoneda Lemma. In some sense, this can be viewed as a vast generalization of Cayley's Theorem, which says that every group is isomorphic to a subgroup of a symmetric group, though on first glance the connection is not especially obvious. After defining what is meant by a category, a functor, and a natural transformation and giving several example of all three, we will state the two most common forms of the Yoneda lemma, show how one of these implies the other, and then explore some of their consequences.

3:30pm: Tea.

4:00pm: Dixon's Theorem: Generating the symmetric group almost surely (Elan Bechor). I sketch a proof of John Dixon's 1969 proof that as n goes to infinity, the probability that two randomly selected elements in S_n generate either A_n or S_n goes to 1. I will also go over Professor Babai's improvement in the speed with which this probability approaches 1.

4:45pm: Mathematicians are all doing the same stuff (Damir Dzhafarov). I'll give examples of several famous theorems from disjoint areas of mathematics which are actuallt logically equivalent. I'll describe more precisely what "logically equivalent" means, but the moral is: mathematicians are copying each other and they don't even know it.