

Geometry and dynamics of $Out(F_N)$

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The group $Out(F_N)$ is an enigmatic and fascinating cousin of the mapping class group of a compact surface. We will discuss two spaces admitting natural $Out(F_N)$ -actions. The *Culler-Vogtmann Outer space* cv_N , introduced by Culler and Vogtmann in 1986, is a free group analog of the Teichmüller space of a hyperbolic surface. The space $Curr(F_N)$ of *geodesic currents* on F_N consists of certain kinds of F_N -invariant measures that generalize the notion of the conjugacy class of an element of F_N . The interaction between the spaces cv_N and $Curr(F_N)$ is given by an $Out(F_N)$ -invariant *geometric intersection form*. We will discuss some homological, geometric and dynamical information about $Out(F_N)$ coming from studying the Outer space and the space of geodesic currents. Time permitting, I'll try to say something about recent developments regarding hyperbolicity of two free group analogs of the curve complex. The course assumes relatively minimal background, but the audience is expected to be familiar with the basics of covering theory and the notion of the fundamental group.