1018-37-245 **Vadim Kaloshin*** (kaloshin@caltech.edu), Mathematics 253-37, Caltech, Pasadena, CA 91125, and **Anton Gorodetski** (asgor@caltech.edu), Mathematics 253-37, Caltech, Pasadena, CA 91125. *How often surface diffeomorphisms have infinitely many sinks and hyperbolicity of periodic points near a homoclinic tangency.*

Consider the space of C^r diffeomorphisms (smooth invertible selfmaps) of a compact surface M (e.g. S^2 or T^2) $\mathrm{Diff}^r(M)$ with $r \geq 2$. A sink of $f : M \to M$ is a periodic point $x \in M$ which attracts all points from its neighbourhood (as in your kitchen). Points attracted to x called basin of attraction of x. In 60-th Thom conjectured that a generic diffeomorphism can not have infinitely many coexisting sinks. Indeed, each sink has an open basin of attraction, and infinitely many of those seems too much. In 70-th Newhouse constructed an open set of diffeomophisms $N \subset \mathrm{Diff}^r(M)$ such that a generic diffeomorphism in N does have infinitely many coexisting sinks. It is an amazing phenomenon, called Newhouse phenomenon. It disproves Thom's conjecture and is significant obstacle to describe ergodic properties of surface diffeomorphisms. We shall discuss this phenomenon. The main result indicates that in some sense this phenomenon has "probability zero". This is a particular case of so-called Palis conjecture. (Received March 07, 2006)