1044-55-187 **Yuli B Rudyak*** (rudyak@math.ufl.edu), Department of Mathematics, University of Florida, 358 Little Hall, Gainesville, FL 32611. *On applications of the Berstein class.*

The talk is based on joint works with A. Dranishnikov, M. Katz and S. Sabourau. The Berstein class of a space X is a certain class $u \in H^1(X; I(\pi))$ where $I(\pi)$ is the augmentation ideal of the group $\pi = \pi_1(X)$. Berstein and Svarc proved that, for a space X with $\dim X = \operatorname{cat} X = n > 2$ one has $u^n \neq 0$. (Here $\operatorname{cat} X$ denotes the Lusternik–Schnirelmann category of X.) We extend this result for $n = 2$. This allows us to prove the following result: If $f : M \to N$ is a map of the degree ± 1 of closed manifolds, then $\pi_1(N)$ is free whenever $\pi_1(M)$ is. Also, we can use the Berstein class to prove that $\pi_1(M)$ is free for every closed manifold M with $\operatorname{cat} M = 2$.

More generally, we discuss relations between the category, the dimension, and the fundamental group of a space.

Some related results on systoles will also be presented. (Received September 01, 2008)