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Title: A functorial approach to classifying manifolds

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Session: Category Theory, Algebraic Topology, K-Theory

The aim of this talk is to show how basic concepts of category theory can be used in the classification of smooth manifolds.

We consider smooth simply-connected n -manifolds M with $([n/2]-1)$ -skeleton a given CW-complex K and $H_{[n/2]}(M) = 0$. These manifolds form a finitely generated abelian group $\Theta_n(K)$, and it can be shown that Θ_n is a functor from the category of CW-complexes to groups. Computation of $\Theta_n(K)$ relies on (among other things) a generalization of Haefliger's exact sequence involving groups of links, which also turns out to be natural in K . As an example I will present the computation of $\Theta_8(K)$ in the case when K is a wedge of 2-spheres. If time permits I will also talk about the role of $\Theta_n(K)$ in the classification of a larger class of manifolds.