

Abstract

Oberwolfach Workshop:

Morphisms in Low Dimensions

Dates:

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Organizers:

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In many areas of pure mathematics, it is a mantra that in order to understand an object, one tries to understand its automorphism group. This point of view has taken a while to percolate through to low-dimensional topology - typically most work has been directed towards classifying the *objects* of the category of interest (for example smooth or topological 4-manifolds, 3-manifolds, knots, or embedded surfaces). Furthermore, in the case that a low-dimensional invariant is functorial (Floer homologies and Khovanov-type homologies for example), most applications of the invariant have tended to make use of the values taken by the invariant on objects and not on morphisms.

Nevertheless, in very recent years, there has been something of a change. To pick two notable examples: Watanabe's work on embedding calculus has shown us how diffeomorphisms of the 4-sphere may be studied, and Zemke's work has used the functoriality of Floer homology to derive powerful new obstructions to ribbon concordance. A common theme in these works is the emphasis on *functoriality* of the invariants, rather than simply computation, and a renewed interest in understanding diffeomorphism groups of a manifold rather than single isotopy groups. In this workshop, we propose to bring together experts on these interrelated topics with the aim of improving community understanding of recent developments in low-dimensional topology and promote new advances in the study of global properties of 4-manifolds.