Bern-Fribourg Graduate Seminar

a seminar for Master and PhD students

Thursday 13th October, 2022: 17:15 - 18:00

Room B5, Exakte Wissenschaften, Bern

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Slice knots - knot theory in dimension 4

Abstract

Knot theory is a subarea of low-dimensional topology - the study of smooth manifolds of dimension 4 or less. Classical knots are smooth embeddings of the (oriented) circle S^1 into $\mathbb{R}^3$ or into the 3-sphere S^3, usually studied up to an equivalence relation called (ambient) isotopy. The concept of "sliceness" is a (natural) generalization in dimension 4 of the question whether certain knots are isotopic to the trivial knot (the so-called unknot). In the talk, we will define all the relevant terms and give examples of slice knots. Along the way, we will see some related important results from low-dimensional topology. For example, the study of slice knots is connected to the existence of "exotic" smooth structures on $\mathbb{R}^4$.