

Seifert Surfaces and Knots

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13.30 - 24/01/2018

Università di Milano-Bicocca

Building U5 - Room 3014

Knot theory studies “simple” objects: knots, which are not much more than a circle embedded in a fixed three-dimensional topological variety (usually \mathbb{R}^3 or S^3). Although its objects seem, as said “simple”, a good honest classification of knots is very far to be achieved. In order to study knots, mathematicians have introduced knot invariants, which are mathematical objects (numbers, groups, polynomials,...) attached to a knot which are -more or less, depending on the invariant- useful in order to distinguish one knot from the other.

Interesting object associated to knots are Seifert surfaces, i.e. compact connected orientable surfaces in the topological 3-fold which have the knot as boundary. These surfaces “are not” knot invariants but are a nice tool in order to study knots and to construct knots invariants. Moreover they are as well useful in unexpected situations. In the talk I will define knots and Seifert surfaces and give an algorithm which can be used to produce a Seifert surface for a given knot. Then, if time permits, I will talk briefly about some applications of Seifert surfaces.

Keywords:

topology • knots • Seifert surfaces • invariants • classification

“Obvious” is the most dangerous word in mathematics.

- Eric Temple Bell