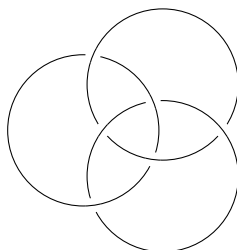# SELECTED TOPICS IN KNOT THEORY

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Figure 1. Borromean rings

A link is a union of (possibly knotted), pairwise disjoint, circles in the space. An example of a link is drawn in Figure 1. Any two of the three circles are unlinked, that is, if the third circle were absent, we could move these two circles apart as far as we please. The third circle prevents us from doing this. In mathematics, we can measure this prevention rigorously by so called Milnor invariants. The fact that the three circles cannot be separated can be translated into a statement, that some Milnor invariants of the union of the three circles is non-zero. A part of the project is devoted to study such Milnor invariants. We plan to obtain results that facilitate computations of these invariants as well as explain their nature.

The link in Figure 1 has another property, namely it is symmetric. A rotation by 120 degrees permutes the three circles, that is, preserves the link. This special property is called *periodicity*. A link that can be drawn in a symmetric way is called *periodic*. We ask which links are periodic. There are many mathematical tools to answer this question, but none of them gives a complete answer. Therefore, we want to create new tools, which can detect periodicity of links.