Berlin Mathematics Research Center MATH+

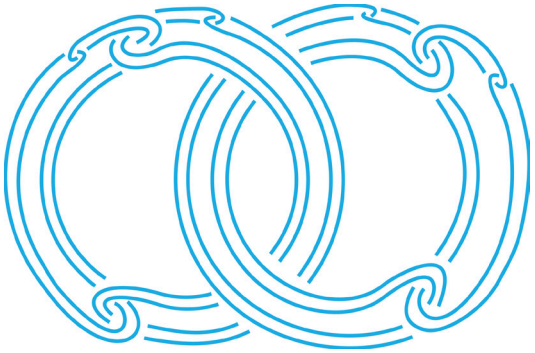
Berlin Mathematical School BMS

MATH+ Friday Colloquium

Friday 15 July 2022 at 14:15

TU Berlin, EW-Gebäude (Physics Building), Room EW 201

Tea & Cookies starting at 13:00!



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Arunima Ray

(MPI Bonn)

Embedding surfaces in 4-manifolds

Manifolds are fundamental objects in topology since they locally model Euclidean space. Within a given ambient manifold, we are often interested in finding embedded submanifolds, which would then enable cutting and pasting operations, such as surgery. The study of surfaces in 4-dimensional manifolds has led to breakthroughs such as Freedman's proof of the 4-dimensional Poincaré conjecture. Important open questions on 4-manifolds can also be reduced to the question of finding certain embedded surfaces.

The talk will consider the following question: when is a given map of a surface to a 4-manifold homotopic to an embedding?

Arunima Ray will give a survey of related results, including the celebrated work of Freedman and Quinn, and culminating in a general surface embedding theorem, arising in joint work with Daniel Kasprowski, Mark Powell, and Peter Teichner.

Arunima Ray is a Lise Meitner research group leader at the Max Planck Institute for Mathematics in Bonn. Her main research interests are in knot theory and the study of 3- and 4-dimensional spaces. She is also interested in pedagogy, as well as equity and inclusion in mathematics.