A U S H A N G

FREIE UNIVERSITÄT BERLIN
Fachbereich Mathematik und Informatik

Promotionsbüro, Arnimallee 14, 14195 Berlin

D I S P U T A T I O N

Montag, 5. Dezember 2022, 15:00 Uhr

Ort: Seminarraum 032
(Fachbereich Mathematik und Informatik, Arnimallee 6, 14195 Berlin)

Disputation über die Doktorarbeit von

Frau Simona Stanislavova Boyadzhiyska

Thema der Dissertation:
Minimal Ramsey graphs, orthogonal Latin squares, and hyperplane coverings

Thema der Disputation:
The extremal number of surfaces

Die Arbeit wurde unter der Betreuung von **Prof. Dr. T. Szabó** durchgeführt.

Abstract: How many edges can an n-vertex graph have if it does not contain a fixed graph H as a subgraph? This is a classic problem in extremal graph theory, dating back to the work of Mantel in the early 20th century. The answer is known as the \emph{extremal number} of H. The study of extremal numbers of graphs, and subsequently also of hypergraphs, has received considerable attention from researchers over the past century. In this talk, we will explore this extremal problem in the setting of 3-uniform hypergraphs, forbidding a \emph{family} of topologically defined hypergraphs.

A 3-uniform hypergraph H can be viewed as a simplicial complex whose faces are given by all subsets $X\subseteq V(H)$ such that X is fully contained in some hyperedge of H. We say that H is \emph{homeomorphic} to a given topological space T if the simplicial complex associated to H is homeomorphic to T. In the 1970s, Brown, Erd\H{o}s, and S\'os studied the largest number of edges in an n-vertex 3-uniform hypergraph not containing a subhypergraph homeomorphic to the 2-sphere, and determined the answer up to a constant factor. A natural next step is to consider the corresponding question for other surfaces. We will present two recent
results, due to Kupavskii, Polyanskii, Tomon, and Zakharov and Sankar, resolving this problem for any closed surface up to a constant factor.

Die Disputation besteht aus dem o. g. Vortrag, danach der Vorstellung der Dissertation einschließlich jeweils anschließenden Aussprachen.

Interessierte werden hiermit herzlich eingeladen

Der Vorsitzende der Promotionskommission
Prof. Dr. T. Szabó