

# A U S H A N G

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## FREIE UNIVERSITÄT BERLIN Fachbereich Mathematik und Informatik

Promotionsbüro, Arnimallee 14, 14195 Berlin

# DISPUTATION

**Montag, 9. Mai 2016, 16.00 Uhr**

**Ort: FB MI, Informatik, Takustr. 9 ,Raum 005**

**Disputation über die Doktorarbeit von**

**Herrn Codrut-Miron Grosu**

**Thema der Dissertation:**

**On certain problems in extremal and additive combinatorics**

**Thema der Disputation:**

**Quasirandom Cayley graphs**

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

Abstract: A graph is called quasi-random if at a large scale, it "looks" as if it has a random edge distribution. A classic result of Chung, Graham and Wilson makes this definition precise and further shows it is equivalent to several other seemingly unrelated properties: in particular, for  $p$ -regular graphs it is equivalent to the second eigenvalue of the adjacency matrix being small.

However, the result of Chung, Graham and Wilson is valid only for graphs with constant density not depending on the number of vertices. As shown by Krivelevich and Sudakov, there are examples of sparse regular graphs with a random-like edge distribution, and for which the second eigenvalue is large.

The purpose of my talk is to present a recent result of Conlon and Zhao, which shows that at least for Cayley graphs the equivalence still holds.

This result is interesting as many of the explicit constructions of quasi-random graphs we have today are Cayley graphs. The proof recasts the problem in terms of norms of matrices and uses an inequality of Grothendieck, which we shall explain.

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. T. Szabó, PhD