

A weekly seminar on Ramanujan graphs in Hausdorff Institute

We are organizing an introductory seminar on *Ramanujan graphs* in HIM Junior Trimester Program on Algebra and Number Theory. The plan is to make this seminar accessible to interested graduate students and junior researchers in the area of Number Theory, Representation Theory and Algebraic Geometry. We would love to see many graduate students and postdoctoral fellows from the diverse branches of mathematics in our seminar. We are going to start in the first week of January with studying some chapters of

Discrete Groups, Expanding Graphs and Invariant Measures, by Lubotzky. later on, we will study some papers on the subject. We will decide about these papers, considering the participants' interests.

Ramanujan graphs are regular graphs whose spectral gaps are optimal. Such graphs are very good spectral expanders. The eigenvalues of the adjacency matrices of these graphs are the eigenvalues of the Hecke operators acting on certain automorphic forms. The construction of Ramanujan graphs are often algebraic and need many heavy number-theoretic techniques. We are particularly interested in Explicit construction of new families of Ramanujan graphs using the theory of automorphic forms.

Our first meeting will take place at 10:30 on Wednesday, 6 Jan 2010, in Hausdorff Institute. There we will give an introduction to the subject and will decide about the day and time of our regular weekly meeting. Meanwhile, all interested participants are encouraged to contact us or talk to us in person. This will help us with preparation of the first lectures, as well as organizing the schedule for the whole trimester. Our email addresses are

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