



## Mathematics and CS Seminar

# Extreme Eigenvalues of critical Erdős-Rényi graphs

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**Host: Laszlo Erdős**

In this talk, we present recent results on the extreme eigenvalues of the adjacency matrix of Erdős-Rényi graphs. The Erdős-Rényi graph  $G$  has  $N$  vertices and any two vertices are connected with probability  $p$ , independently of other edges.

If  $p$  is large then the adjacency matrix  $A$  of  $G$  behaves like a Wigner random matrix and has the semicircle law on  $[-2,2]$  as limiting eigenvalue density. Moreover, the extreme eigenvalues converge to  $-2$  and  $2$ , respectively.

If  $p$  is small then, however,  $A$  has many eigenvalues outside  $[-2,2]$ .

Recently, the critical value of  $p$  for this transition has been determined and a precise connection between the large degrees of  $G$  and the extreme eigenvalues of  $A$  has been established.

This is joint work with Raphael Ducatez and Antti Knowles.

**Thursday, July 11, 2019 03:30pm - 06:00pm**

IST Austria Campus Heinzl Seminar Room / Office Bldg West (I21.EG.101)



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