

# ASYMPTOTICAL PROPERTIES OF RANDOM STRUCTURES

Moscow Institute of Physics and Technology (National Research University)

Degree or qualification is awarded: **PhD (Candidate of Science)**

Language of study: **English**

Mode of study: **full-time**

Duration: **4 years**

Availability of free education: **yes**

Price: **375 000 RUB**

Programme curator: **Denis Ustyuzhaninov**

Tel.: **+7 (498) 713 91 70**

E-mail: [interadmission@phystech.edu](mailto:interadmission@phystech.edu)

## Entry requirements:

- Master's degree / equivalent in a related field
- B2 level of English
- Good track record of publications related to the topic of the intended research
- Strong research proposal 1,500 - 3,500 words

## Research supervisor:

[Maksim Zhukovskii](#)

PhD, DSc

## Entry requirements:

- Master's degree / equivalent in a related field
- B2 level of English
- Good track record of publications related to the topic of the intended research
- Strong research proposal 1,500 - 3,500 words

## Supervisor's research interests:

Logical limit laws, distribution of subgraphs in random graphs, percolation in graphs and random graphs, subgraph-saturation and weak saturation, logical complexity of graph properties and expressibility of first order and second order logics.

## Research highlights:

Collaboration with international researchers.

## Supervisor's specific requirements:

- PhD student should be familiar with basic notions and facts of calculus, combinatorics (in particular, graph theory), probability and stochastic processes.

## Main publications:

- M.E. Zhukovskii, On the zero-one k-law extensions, European J. of Combinatorics,60(2017):66-81.
- L.B. Ostrovsky, M.E. Zhukovskii, Monadic secondorder properties of very sparse random graphs, Annals of pure and applied logic, 2017, Vol. 168, pp. 2087-2101.
- A. Kupavskii, M. Zhukovskii, Short monadic second order sentences about sparse random graphs, SIAM J Disc Math, 2018, Vol. 32, No. 4, P. 2916-2940.
- O. Verbitsky, M. Zhukovskii, Tight bounds on the asymptotic descriptive complexity of subgraph isomorphism, ACM Transactions on Computational Logic, Volume 20, Issue 2, 2019.
- S.N. Popova, M.E. Zhukovskii, Existential monadic second order logic of undirected graphs: a disproof of the Le<sub>1</sub>

Bars conjecture, Annals of Pure and Applied Logic, 170 (2019) 505-514.

## **Specializations within this programme**