VIRTUAL KNOT THEORY

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**
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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:
Vassily Manturov
PhD, DSc

Supervisor's research interests:

- Knot theory, in particular, virtual knot theory.
- Study of topology and dynamics, in particular, by means of topological invariants valued in groups G{n}^{k}.
- Studying framed regular 4-graphs, in particular, graph minor theory.
- Combinatorial group theory.
- Chromatic numbers of spaces and lattices.
- Steiner networks.
- Self-interlocking structures.

Research highlights:

- Organized a series of Russian-Chinese conferences on knot theory (annual, since 2014).
- My application was the unique winner of Russia-Korea joint RFBR grant (2019).
- Winner Russia-China RFBR grants.
- Participant in a mega grant for the third time(presently in Novosibirsk State University; head oflaboratory Louis H. Kauffman). Author of 7 monographs.
- Gave lectures in Chinese in Tsinghua and otheruniversities of China; possess 13 other languagesincluding French, German, Spanish etc.
- Holding a seminar in the Moscow State Universitysince 2000, holding a seminar in Tsinghua, Yauinstitute, Mathematical Colloquium of BMSTU.
- One "Kruzhok" (student's seminar), (all four seminarsrun weekly online).
- Managing Editor of "Journal of Knot Theory and ItsRamifications".
- Three Ph.D. students defended in 2013,2014,2018including one from Republic of Korea (now workingin Russia).
- Professor of the Russian Academy of Sciences.

Supervisor's specific requirements:

- Standard university algebra and topology courses,elements of knot theory; programming in
- Mathematics preferable.

Main publications:

- V.O. Manturov, I.M. Nikonov, “On Braids andGroups G{n}^{k}”, Journal of Knot Theory and Its Ramifications, 24:10 (2015), 16 pp.
- V.O. Manturov, D.A. Fedoseev, I.M. Nikonov, S. Kim “Invariants and Pictures: Low-dimensional Topology and Combinatorial Group Theory” Series on Knots and Everything: Volume 66 May 2020 Pages: 388.
- V.O. Manturov “Parity in knot theory” Sbornik: Mathematics (2010), 201(5):693.

Specializations within this programme