

QUANTUM GRAVITY AND COSMOLOGY

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:

Duration: **4 years**

Availability of free education: **yes**

Price: **375 000 RUB**

Programme webpage at the university website: <https://eng.mipt.ru/programs/quantum-gravity-and-cosmology/>

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:

[Andrei Barvinsky](#)

PhD, DSc

Supervisor's research interests:

Mathematical methods of quantum field theory and quantum gravity, quantum cosmology and physics of the early quantum Universe, inflation theory, dark energy problem.

Research highlights:

Synthesis of mathematical methods and applications in physics of the very early Universe and relativistic cosmology.

Supervisor's specific requirements:

- Basic knowledge of quantum field theory.
- Foundations of general relativity.
- Basic methods of mathematical physics.

Main publications:

- A.O. Barvinsky, D. Blas, M. Herrero-Valea, S.M. Sibiryakov, and C.F. Steinwachs, Renormalization of Hořava gravity, Phys. Rev. D 93, 064022.
- A.O. Barvinsky, A. Yu. Kamenshchik, C. Kiefer, A.A. Starobinsky and C. Steinwachs, Asymptotic freedom in inflationary cosmology with a non-minimally coupled Higgs field, JCAP 12(2009)003.
- A.O. Barvinsky, A. Yu. Kamenshchik, C. Kiefer, A.A. Starobinsky and C. Steinwachs, Higgs boson, renormalization group, and naturalness in cosmology, EPJC 72 (2012) 2219.

Specializations within this programme