

NUCLEAR PHYSICS WITH NEUTRONS

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 webpage at the university website: <https://eng.mipt.ru/programs/nuclear-physics-with-neutrons/>

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:

[Yuri Kopatch](#)

PhD

Supervisor's research interests:

- Tagged neutron method.
- Nuclear fission (neutron induced and spontaneous).
- Violation of fundamental symmetries (T- and P-violation in neutron-induced reactions).
- Neutron lifetime.

Research highlights:

Participation in several research projects can be proposed for the student:

- Using the TANGRA setup, consisting of an ING-27 tagged neutron generator and a set of gamma-ray and/or neutron detectors for elemental analysis and investigation of nuclear reactions.
- Nuclear fission studies, including research on ternary/quaternary fission, T-odd effects in fission, neutron and gamma-ray emission from fission. Collaboration with IPHC (Strasbourg) is possible.
- Participation in the CERN nTof project.

Supervisor's specific requirements:

The applicant is expected to have at least basic knowledge of nuclear physics, data analysis and nuclear electronics. Specific requirements:

- Programming skills, knowledge of programming languages, preferably C/C++.
- Experience with ROOT framework (root.cern.ch).
- Monte Carlo simulations, specifically using GEANT4 toolkit (geant4.cern.ch).
- Experience with digitizers and digital data processing.

Main publications:

- Grozdanov D. et al, Physics of Atomic Nuclei. 2020., Vol. 83, no. 3., P. 384–390.

- Chietera A. et al, The European Physical Journal A – Hadrons and Nuclei. 2018. T. 54. № 6. C. 98.
- Gagarski A et al, Physical Review C. 2016. T. 93. № 5. C. 054619.

Specializations within this programme