

# DEVELOPMENT OF FINITE DIFFERENCE SCHEMES AND NUMERICAL SIMULATION OF NEUTRONS OR RADIATION TRANSPORT PROCESSES UNDER CONDITION OF STRONG INTERACTION WITH MATTER

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)

## **Research supervisor:**

[Elena Aristova](#)

PhD, DSc

## **Supervisor's research interests:**

Modelling of physical processes in active zones of fast reactors or thermonuclear targets is conjugated with numerical solving of high order transport equation. High dimensionality of this equation and dependence of its coefficients on state of matter leads to necessity of effective dimensionality reduction. Methods for numerical solving both high and low order transport equations are developing and applying in physical and technical problems.

## **Supervisor's specific requirements:**

- Course of functional analysis.
- Full courses of general and theoretical physics.
- High programming skills in the C++ or Fortran.
- Knowledge of parallel algorithms.

## **Main publications:**

- Aristova E.N., Rogov B.V. Bicomcompact scheme for the multidimensional stationary linear transport equation // Applied Numerical Mathematics, v. 93, p.3-14, July 2015.
- Rozanov V.B., Aristova E.N. et al. Interaction of laser radiation with a low-density structured absorber // Journal of Experimental and Theoretical Physics, 2016, Vol. 122, No 2, pp. 256-276.
- Aristova E.N., Baydin D.F., et al. Core Design of Long Life-Cycle Fast Reactors Operating Without Reactivity Margin // International congress on advances in nuclear power plants, Proceedings of ICAPP'12, June 24-28, 2012, Chicago, USA, paper 12255, Curran Associates, Inc., (2012), pp.1064-1071.
- Aristova E.N., Simulation of radiation transport in channel on the basis of quasi-diffusion method // Transport Theory and Statistical Physics, v.37 (05-07), p. 483-503, 2008.

## **Specializations within this programme**