

# Polyachenko Yury

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## Education

### Moscow Institute of Physics and Technology (State University) (MIPT)

Moscow, Russia

B.S. IN APPLIED PHYSICS AND MATHEMATICS, SPECIALIZATION IN COMPUTATIONAL PHYSICS

Sep. 2017 - Present

- **Specialization:** Basics of computational condensed matter physics, Molecular dynamics, Practice of HPC, Machine learning in condensed matter physics
- **Mathematics:** Real analysis and Calculus, Differential geometry, Harmonic analysis, Complex Analysis, Analytic geometry, Linear algebra, Differential Equations, Computational Mathematics.
- **Physics:** General Physics (Mechanics, Thermodynamics and Molecular Physics, Electricity and Magnetism, Physical Optics), Theoretical Mechanics, Field Theory, Quantum Mechanics, Mathematical Physics.
- **Computer Science:** C/C++, Introduction to UNIX-based systems and multithreading, Introduction to parallel computations via MPI and CUDA.
- **GPA 4.01/4.3, top 3% of the class.**

## Experience

### Joint Institute for High Temperatures of the Russian Academy of Sciences (JIHT RAS), Laboratory of non-ideal plasma theory

Moscow, Russia

LABORATORY ASSISTANT

Sep. 2018 - Present

- Investigated behaviour of the L-J system near the boiling points via space-time correlators. Delivered a report at the MIPT conference. 2019. Academic advisor - Norman G.E. Work was supported by the Russian Science Foundation.
- Studied self-diffusion in Lennard-Jones systems using classical MD implemented in LAMMPS. Delivered a report on the obtained results at the MIPT conference. 2018. Academic advisors - Timofeev A.V. and Norman G.E.
- [Created](#) from scratch an MD simulation engine (C/C++, CUDA, OpenMP, Python, Matlab). Package was used to test and improve MKT equations. 2018.

### Moscow Institute of Physics and Technology (State University) (MIPT), Department of Computer Science

Moscow, Russia

ASSISTANT TEACHER

Sep. 2019 - Dec. 2019

- Worked as a mentor and assistant teacher on the python CS course for freshmen.
- Helped to design new [Python exercises](#) for an updated python CS course.

### Innovative Oil and Gas Technologies (IOGT), Department of methodological support for geophysical well logging

Moscow, Russia

PROGRAMMER

Feb. 2019 - May. 2019

- Created 2 Matlab standalone GUI applications aimed to automatize and standardize the process of interpretation of well-logging data.

### Moscow Institute of Physics and Technology (State University) (MIPT), Laboratory of Mechanical Systems and Processes Modeling

Moscow, Russia

INTERN

Aug. 2018 - Oct. 2018

- Modelled elastic wave propagation using ray tracing (Matlab, C/C++, OpenMP). [git](#).
- The project was used as a proof-of-concept model in the work «Development of methods of modeling processes in a human body upon application of intelligent systems of non-invasive surgery» supported by the Russian Science Foundation.

## Conferences & Summer schools

### 62<sup>st</sup> National Scientific MIPT Conference, Specialization «Fundamental bases of multi-scale atomistic simulation and modeling» // Works of the 62<sup>st</sup> National Scientific MIPT Conference. Fundamental and applied physics. 2019. pp. XXX.

Moscow, Russia

POLYACHENKO Y. A., FLEITA D. I., PISAREV V. V., NORMAN G. E. «SINGULARITY AT THE POINT OF TRANSITION FROM EQUILIBRIUM TO METASTABLE STATES OF LENNARD-JONES VAPOR AND LIQUID»

18–23 Nov. 2019

### 16<sup>th</sup> Russian Symposium FAMMS-2019 Foundations of Atomistic Multiscale Modeling and Simulation.

New Athos, Georgia

POLYACHENKO Y. A., FLEITA D. I., PISAREV V. V., NORMAN G. E. «STUDY OF LENNARD-JONES SYSTEM NEAR THE BOILING POINT VIA SPACE-TIME CORRELATORS» // PROCEEDINGS OF 16<sup>TH</sup> RUSSIAN SYMPOSIUM FAMMS-2019 FOUNDATIONS OF ATOMISTIC MULTISCALE MODELING AND SIMULATION. P. 10.

15–26 Aug. 2019

## Mathematical modeling internship at the Russian national educational center Sirius in the scientific-technological project program «Big Challenges»

Sochi, Russia

INTERN

1–24 Jul. 2019

- Helped senior-school students master Linux, bash, Python and LAMMPS
- Guided a group of senior school students in conducting a research dedicated to studying collective motion in Lennard-Jones systems.

## Summer School on Classical Molecular Dynamics for Material Science, Nanotechnology and Biophysics, SISSA

Trieste, Italy

STUDENT

10–21 Jun. 2019

- Studied and practiced basic MD simulation techniques and programming tools.
- Became acquainted with several more advanced topics such as Dimension reduction, Enhanced sampling, Polymer and Protein dynamics.

## 61<sup>st</sup> National Scientific MIPT Conference, Specialization «Fundamental bases of multi-scale atomistic simulation and modeling»

Moscow, Russia

POLYACHENKO Y.A., TIMOFEEV A.V. «DIFFUSION IN THE LENNARD-JONES SYSTEM». // WORKS OF THE 61<sup>ST</sup> NATIONAL

SCIENTIFIC MIPT CONFERENCE. FUNDAMENTAL AND APPLIED PHYSICS. 2018. PP. 165-167.

19–25 Nov. 2018

## Achievements

Aug. 2019 **Co-author**, Program « $\beta$ -GeoGaz» registered in the Russian Federal Service for Intellectual Property

Aug. 2019 **Co-author**, Program « $\alpha$ -GeoGaz» registered in the Russian Federal Service for Intellectual Property

Aug. 2019 **100% final grade**, Stanford «Machine Learning» course on Coursera

Jan. 2019 **Awardee**, National Physics Olympiad for Undergraduates «I am a professional»

Moscow, Russia

Jan. 2019 **Awardee**, National Mathematics Olympiad for Undergraduates «I am a professional»

Moscow, Russia

Nov. 2018 **2<sup>nd</sup> place**, 61<sup>st</sup> National Scientific MIPT Conference

Moscow, Russia

Jun. 2018 **Top 10 of the course (~ 1100 people)**, Scientific project competition.

MIPT

Apr. 2017 **29<sup>th</sup> place**, Russian National Physics Olympiad for high school students.

Kazan, Russia

## Skills

**Over 5000 lines** C/C++, Matlab, Python, Linux

**Had some experience with**

C/C++: OpenMP, POSIX threads, MPI, CUDA, OpenGL, VCL/Firemonkey

Python: scipy, numpy, matplotlib

Other: Wolfram Mathematica,  $\LaTeX$ , Origin

**Languages** Russian, English