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 a MD simulation engine (C/C++, CUDA, OpenMP, Python, Matlab). 2018. git/molecules.

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's research — *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/waves
- 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.

Extracurricular Activity

Took Stanford «Machine Learning» course on Coursera

Got 100% score — *Aug. 2019*

Summer School on Classical Molecular Dynamics for Material Science, Nanotechnology and Biophysics, SISSA — *Italy*

Student — *10-21 Jun. 2019*

- Had lectures and practice on basic MD simulation techniques and programming tools.
- Got a glimpse of several more advanced topics such as Dimension reduction, Enhanced sampling, Polymer and Protein dynamics.

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

Achievements

Participant, 16th Russian Symposium FAMMS-2019 Foundations of Atomistic Multiscale Modeling and Simulation.

Aug. 2019 — *Polyachenko Y. A., Fleita D. Iu., Pisarev V. V., Norman G. E. «Study of Lennard-Jones system near the boiling point via space-time correlators» // Proceedings of 16th Russian Symposium FAMMS-2019 Foundations of Atomistic Multiscale Modeling and Simulation. P. 10.* — *New Athos, Georgia*

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

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

25 Nov. 2018 — **2nd place**, 61st National Scientific MIPT Conference, Specialization «Fundamental bases of multi-scale atomistic simulation and modeling»
Polyachenko Y.A., Timofeev A.V. Diffusion in the Lennard-Jones system. // Works of the 61st National Scientific MIPT Conference. Fundamental and applied physics. 2018. pp. 165-167. — *Moscow, Russia*

Jun. 2018 — **Top 10 of the course (∼ 1100 people),** Scientific project competition. MD simulation package was created and used to test and improve MKT equations. — *MIPT*

Apr. 2017 — **29th 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