



# POLYACHENKO Yury

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## Education

### Moscow Institute of Physics and Technology (National Research University) (MIPT)

Moscow, Russia

B.S. IN APPLIED PHYSICS AND MATHEMATICS,

Sep. 2017 - Present

SPECIALIZATION IN COMPUTATIONAL CONDENSED MATTER PHYSICS AND BIOPHYSICS

- **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, Mathematical Physics (aka Partial Differential Equations).
- **Physics:** General Physics (Mechanics, Thermodynamics and Molecular Physics, Electricity and Magnetism, Physical Optics), Theoretical Mechanics, Field Theory, Quantum Mechanics.
- **Computer Science:** C/C++, Introduction to UNIX-based systems and multithreading, Introduction to parallel computations via MPI and CUDA.
- **GPA 4.97/5 (9.11/10), top 3% of the class.**

## Experience

### Joint Institute for High Temperatures of the Russian Academy of Sciences (JIHT RAS),

Moscow, Russia

#### Laboratory of non-ideal plasma theory

LABORATORY ASSISTANT

Sep. 2018 - Present

- Investigated behaviour of the Lennard-Jones system near the boiling points via space-time correlators. Delivered reports at several conferences. 2019. Academic advisor - Norman G.E.. Project 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 Kinetic Molecular Theory equations. 2018.

### Moscow Institute of Physics and Technology (National Research University) (MIPT),

Moscow, Russia

#### Department of Computer Science

TEACHING ASSISTANT

Sep. 2019 - Dec. 2019

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

### Innovative Oil and Gas Technologies (IOGT),

Moscow, Russia

#### Department of methodological support for geophysical well logging

PROGRAMMER

Feb. 2019 - May. 2019

- Created 2 Matlab standalone GUI applications aimed at automatization and standardization of the process of interpretation of well-logging data.

### Moscow Institute of Physics and Technology (National Research University) (MIPT),

Moscow, Russia

#### Laboratory of Mechanical Systems and Processes Modeling

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

### XXXV International Conference on Equations of State for Matter

Kabardino-Balkaria, Russia

POLYACHENKO Y. A., FLEITA D. I.U., PISAREV V. V., NORMAN G. E. «EQUILIBRIUM – METASTABLE SINGULARITY IN THE

LENNARD-JONES SYSTEM» // ABSTRACTS OF THE XXXV INTERNATIONAL CONFERENCE ON EQUATIONS OF STATE FOR MATTER.

1-6 Mar. 2020

2020. P. 247.

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

Moscow, Russia

POLYACHENKO Y. A., FLEITA D. I.U., PISAREV V. V., NORMAN G. E. «SINGULARITY AT THE POINT OF TRANSITION FROM EQUILIBRIUM TO METASTABLE STATES OF LENNARD-JONES VAPOR AND LIQUID» // WORKS OF THE 62<sup>ST</sup> NATIONAL SCIENTIFIC MIPT CONFERENCE. FUNDAMENTAL AND APPLIED PHYSICS. 2019. PP. 216-217.

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.U., 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

30 Jun. – 26 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

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[Jan.2019 – Aug.2020] **Recipient**, Scholarship for excellence in studies

Feb. 2020 **Elected**, EPFL summer research program (canceled due to COVID)

Lausanne, Switzerland

Feb. 2020 **Elected**, Wolfram summer school (moved to online due to COVID)

Boston, USA

Feb. 2020 **Elected**, HZB summer student program (canceled due to COVID)

Berlin, Germany

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 class (~ 1100 people)**, Scientific project competition.

MIPT

Aug. 2017 **President scholarship (for 4 and possibly 6 years)**, For multiple school achievements.

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

Kazan, Russia

## Skills

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**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, sklearn, jupyter

Other: Git, Wolfram Mathematica,  $\LaTeX$ , Origin

**Human languages** Russian (Native), English (B2 – C1)