Ruslan Mallaev

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Education

Moscow Institute of Physics and Technology (MIPT) September 2020 - Present
Landau School of Physics and Research
B.S. Degree program: Applied mathematics and physics
Basic department: Computational physics of condensed matter and living systems

Current degree: 4th year student
General GPA: 3.73/4.0 (8.5/10 - top 10% of the course)
Courses completed:

- Technical disciplines: Quantum mechanics, Physics of soft matter, Solid state physics, Computational Condensed Matter Physics, Computational Mathematics, Applied Statistics, Probability theory, Analytical Geometry, Theory of functions of a complex variable, General Physics: Mechanics, Molecular Physics, Electricity and Magnetism, Optics, Quantum physics; Mathematical Analysis, Linear Algebra, Field theory (math), Analytical mechanics, Field theory, Differential Equations, Equations of mathematical physics, Tensor networks and their applications
- Laboratory workshops: Computational statistical physics, Fundamentals of modern physics, Molecular Dynamics, General Physics
- Programming: Advanced C++ Programming (3 semesters), Machine learning in condensed matter physics, Applied Statistics, Introduction to Supercomputer Simulation, Programming using Python, Numerical Simulation of Physical Processes (C++/Python)

Work experience

Laboratory of biomolecular modeling, Shemyakin–Ovchinnikov Institute of bioorganic chemistry RAS October 2021 - Present
Supervisor: *Anton Polyansky*, PhD

- Investigation of the role of transmembrane domains in activation of single-pass membrane receptors
- Modeling and analysis of conformational dynamics and dynamic coupling in bimolecular ensembles
- Understanding of allosteric communication in biomolecules using information theory

TerraQuantum April 2022 - Present

- Computational solution of differential equations using tensor networks in the scientific problems in soft matter and quantum chemistry

Center for Pedagogical Excellence October 2020 - August 2022

- Worked as a teacher of a high-level physics course for high school students
- Worked as a methodologist in compiling a program for schoolchildren in Olympiad physics

Volunteer work July 2021 - Present

- In August 2021, I went as a volunteer on a geological expedition to the Ukok plateau (Altai) with a group of geographers from St. Petersburg State University under the leadership of Professor Dmitry Ganyushkin
- Since April 2022, I have been a Data-Scientist in a scientific work devoted to the study of case histories of those who have recovered from COVID-19

Conference presentations

III Student Biochemical Forum March 2023
– Talk presented in Moscow, Russia

65th All-Russian Scientific Conference MIPT April 2023
– Talk presented in Moscow, Russia

Extracurricular courses

Neural Networks and Deep Learning 2020
– 5 week long online course (5-hours/week) by DeepLearning.AI at Coursera.org
SQL for data science 2021
– 4 week long online course (5-hours/week) by UC Davis at Coursera.org
Introduction to Git and GitHub 2021
– 4 week long online course (4-hours/week) by Google at Coursera.org
Numerical Simulation of Physical Processes (C++/Python) 2021
– 4 months course (4-hours/week) at Moscow Institute of Physics and Technology
Selected questions of algebra and number theory 2021
– 4 months course (2-hours/week) at Moscow Institute of Physics and Technology
Physics of soft matter 2022
– 4 months course (4-hours/week) at Moscow Institute of Physics and Technololgy
Applied Statistics 2022
– 4 months course (6-hours/week) at Moscow Institute of Physics and Technology
Mathematical methods in the kinetic theory of gases and plasmas 2021-2022
– 9 months course (2-hours/week) at Moscow Institute of Physics and Technology
Biostatistics 2022
– 4 months course (4-hours/week) at Moscow Institute of Physics and Technology
Tensor networks and their applications 2022
– 4 months course (4-hours/week) at Moscow Institute of Physics and Technology

Personal skills

Molecular modeling	MD, GROMACS, PARENT, VMD, PyMOL, OVITO, APBS
Languages	English (B1), French (A2), Russian (native)
Software	C++ (STL, GSL, Boost, etc.), Python (numpy, scipy, pytorch, etc.), Bash, tt.py, Wolfram Mathematica, Git, LaTeX, SQL

Other interests

Sports	Advanced jiu-jitsu wrestler and air rifle shooter, member of MIPT rugby team
Social activities	Head of the group, member of student trade union committee
Hobbies	Travelling, reading, mentoring kids, playing the accordion