

Grigory Shutov

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DOB: the 7th of December, 1997

Curriculum Vitae

Work Experience

- Jan. 2021 – present **Laboratory assistant**, *Skoltech*, Computational Materials Discovery Laboratory, **Supervisor**: Prof. Oganov A. R.. Investigation of modern methods for materials prediction, e.g. Generative adversarial networks.
- Nov. 2020 – present **Laboratory assistant**, *VNIIA*, Center for Basic and Applied Research, **Supervisor**: Ph.D. Kruglov I.A. Implementation of machine learning methods in solving PDE, i.e. fluid dynamics problems.
- Sep. 2019 – Oct. 2020 **Laboratory assistant**, *MIPT*, Computational Materials Discovery Laboratory, **Supervisor**: Ph.D. Kruglov I.A. Searched for superconducting La-Mg-H ternary polyhydrides using evolutionary algorithm USPEX. Studied their dynamical and electronic properties with DFT implemented in VASP. Calculated their critical temperature by methods of DFPT implemented in Quantum Espresso.
- Nov. 2014 – Apr. 2016 **Laboratory assistant**, *Institute for Physics of Microstructures RAS*, **Supervisor**: Ph.D. Churin S.A. Synthesized superconducting YBaCuO. Studied their crystal structure and superconducting properties in dependence of synthesis conditions and alloying.

Education

- 2020–2022 (anticipated) **Skolkovo Institute of Science and Technology**, *Materials Science, Computational Materials Science*, M.Sc. in Materials Science.
Relevant coursework:
Experimental Materials Science: Experimental methods of materials research, Applied materials and design, Materials chemistry
Computational Materials Science: DFT, Molecular dynamics, Cathode materials modelling, Computational study of molecules
Theoretical Physics: Quantum mechanics, Quantum field theory
Computer Science: Machine learning
Entrepreneurship & Innovation: Technology entrepreneurship
- 2017–2020 **Moscow Institute of Physics and Technology**, *School of Electronics, Photonics and Molecular Physics, Department of Molecular and Chemical Physics*, B.Sc. at Applied Mathematics and Physics.
Relevant coursework:
Mathematics: Calculus, Linear algebra, Analytic geometry, Differential equations, Probability theory, Complex analysis
Physics: General physics, Analytical mechanics, Quantum mechanics, Field theory, Chemical physics
Physics (specialized): Physics of low-temperature plasma, Chemical physics, Physics of nanoparticles
Computer Science: Computational mathematics, Programming (Python, C++, Java), Programming methods in modeling physical processes
Material Science: Supercomputer materials modelling, Molecular dynamics, Modelling methods in Molecular physics
Other subjects: Chemistry, Physical methods of substances research, Supercomputer molecular modeling

Honors & Awards

- 2020 **Participant of XXXV International Conference on Equations of State for Matter**, *Elbrus, Russia*.
Topic: Stable ternary superconducting hydrides in La-Mg-H system
- 2016 **Winner of "Rosatom" Science Olympiad by Moscow Engineering and Physics Institute**.
Branch: Physics and Mathematics
- 2016 **Participant of Intel International Science and Engineering Fair**, *Phoenix, Arizona*.
Project subject: "Superconductors as a way to obtain the high-powered magnetic fields"
- 2015 **Prize-winner of Russian Outbreak in Science and Technology Science and Engineering Fair**.
Project subject: "Growing and researching the properties of YBaCuO superconducting rings"

Scientific Interests

- Theoretical Solid-state physics, DFT, DFPT, superconductivity, Eliashberg theory
- Computer Science Evolutionary algorithms, parallel programming, high-performance computations, deep learning, generative adversarial networks, computational mathematics
- Applied Superconductive materials

Computer Skills

- Computational Chemistry VASP, USPEX, Quantum Espresso, Gaussian, MOPAC, LAMMPS, Python-SSCHA
- Python Materials analysis: Pymatgen, SeekPath, ASE, Phonopy, sumo
Data analysis and visualization: NumPy, Matplotlib, SciPy, Pandas
Parallel programming: Mpi4py

Machine learning: PyTorch

C++ Object-oriented programming, parallel programming

Mathematica Computational mathematics, data analysis and visualization

Matlab Data analysis, materials analysis

JavaScript Web design

Other Linux cluster user, LaTeX

Laboratory Skills

Physics NMR and EPR, FTIR, XRD

Chemistry Ceramics manufacturing, analytical chemistry

Languages

English Upper-Intermediate

Russian Native speaker

German Pre-Intermediate