



## ABOUT ME

Student of Skolkovo Institute of Science and Technology, theorist and programmer, graduated from MSU with honors in 2021. Currently, my scientific work is connected with the application of reinforcement learning in material science tasks.

**Date of birth:** 16 December 1999

**Place of Birth:** Zheleznogorsk-Ilimskiy, Russia

**Nationality:** Russian

## CONTACT ME

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## AWARDS AND ACHIEVEMENTS

- Fellow of the Foundation for the Development of Theoretical Physics and Mathematics "BASIS" (2021-2022)
- Certificate of attendance online VASP workshop with the title Moving ions with VASP (September 2022)
- "Best team" award at the Innovation workshop-2022, Skoltech (October 2021)
- Certificates of completion of "Coursera" courses: "Mathematics and Python for data analysis", "Training on labeled data" (November 2021)

# ELENA TRUKHAN

## EMPLOYMENT

### Work experience

**May 2021 - January 2022: laboratory assistant** (Lomonosov State University, Faculty of Physics)

- studying interactions of chains of nanoparticles in the anapole state with pulsed radiation

**2021 - 2022: freelance writer** (Internet edition "N+1")

- contributing the following materials

- <https://nplus1.ru/blog/2021/11/15/tire-wear>
- <https://nplus1.ru/material/2022/02/21/burning-and-heating>
- <https://homo-science.ru/post/pochemu-s-solntsa-duet-veter>

**April 2018 - October 2018: SMM manager** (Press Service of the All-Russia Science Festival "NAUKA 0+")

- management of the Festival's social media pages  
- preparing press releases for the press Service of MSU  
- management of social media of the Global Forum on Convergent Technologies in Sochi (2018)

### Participation in grants

**2021: grant #21-12-00151** from Russia Science Foundation (RSF) "Dark modes and dynamic resonance effects in nanophononics" (2021 - 2022)

### Teaching experience

**2018 - present: Private lessons** in physics and mathematics for schoolchildren

## WORKING EXPERTISE

**2022-present: Programmer** at the startup "KidneyAI: Computer Vision Software for Enhancing the Analysis of Human Kidney Tissue Images by Locating and Calculating Bowman's Capsules"

- implementation of computer vision to create the neural network that makes Image-segmentation and locate Bowman Capsules.

**2021-present: Application of reinforcement learning** to accelerate ionic optimization in structure relaxation (Skolkovo, Computational Materials Discovery Laboratory)

- creating the neural network that can predict first the most efficient steps of ionic relaxation based on the properties of a given structure

**2018 - 2021: Optimization of near-filed amplification** in resonant light scattering by nanoparticles (Lomonosov State University, Faculty of Physics, Laboratory of Nonlinear, Nonequilibrium and Complex Systems)

- The winner of the All-Russian competition of youth projects among individuals "Rosmolodezh. Grants season 2» provided by Federal Agency for Youth Affairs (Rosmolodyozh) for summer school in Zheleznogorsk-Ilimsky (October, 2022)

## INTERESTS

**Scientific:** solid state physics, condensed matter, computational materials science, crystal physics, machine learning, deep learning, reinforcement learning.

**Other interests:** literature, journalism, hiking, tourism.

## SKILLS

### Languages

English, Russian (native)

### Computing

Python (pandas, numpy, Sklearn, matplotlib, ASE, pytorch, etc.), Matlab, C++, Wolfram Mathematica, VASP, Origin.

### Soft skills

Good presentation skills, leadership, open-mindedness, teamwork, well developed time management

- searching for the parameters of a system of a spherically symmetric particle with a complex permittivity, at which fields of the maximum possible concentration will be observed in the minimum possible region

**2017 - 2018:** *Magneto-optical trap characterization (Lomonosov State University, Faculty of Physics, Quantum optical technologies laboratory)*

- derivation of the formula for calculating the temperature of a magneto-optical trap from the experimental data obtained with the "release and recapture" method.

## PUBLICATIONS AND CONFERENCES

### Conferences

**2021:** *Lomonosov student conference, Moscow, Russia*

**2022:** *Lomonosov student conference, Moscow, Russia*

### Publications and abstracts for the conferences

- Trukhan E., Tribelsky M.I., Optimization of near-filed amplification in resonant light scattering by nanoparticles, Materials of the 28th International Scientific Conference for Undergraduate and Graduate Students and Young Scientists «LOMONOSOV», abstracts, ISBN 978-5-317-06593-5 (2021)

- Trukhan E., Tribelsky M.I., Optimization of near-filed amplification in resonant light scattering by core-shell nanoparticles, Materials of the 29th International Scientific Conference for Undergraduate and Graduate Students and Young Scientists «LOMONOSOV», abstracts, p. 336-337, ISBN 978-5-8279-0220-1 (2022)

## EDUCATION

### 2022 - present: Skolkovo Institute of Science and Technology, Materials Science Department

*MSc in field of science and technology 22.04.01 Material Science and Technology of Materials*

### 2021 - 2022: Department of Physics of Polymers and Crystals, Faculty of Physics, Lomonosov Moscow State University, Russia

*MSc in Physics, Profile (specialization) of training "Physics of functional nanomaterials" (not completed)*

### 2017 - 2021: Faculty of Physics, Lomonosov Moscow State University, Russia

*Bachelor in Physics (First Class Hons.)*

Subject of the qualifying work: "Optimization of near-filed amplification in resonant light scattering by nanoparticles", supervised by Dr. Prof. Tribelsky M.I.

## VOLUNTEERING

**2022:** *Summer school "SHTO: school of technical discoveries"*  
Chief organizer, teacher of mathematics, curriculum designer.