ARTEM KOTOV

PhD Student @ St. Petersburg State University | Junior ML Engineer

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EXPERIENCE

Engineer Researcher

Quantum Mechanics Lab @ St. Petersburg State University

Aug 2018 – Present · St. Petersburg, Russia

- Research and development of numerical algorithms for a relativistic spectrum calculation of the diatomic quasimolecules
- Performing chemical property calculation of the super-heavy elements and molecules

Teaching

St. Petersburg State University

Feb 2018 – Jun 2018 · St. Petersburg, Russia

- Theoretical and practical course on the introduction to the quantum mechanics for college students

EDUCATION / COURSES

PhD student in Physics

St. Petersburg State University

Sep 2020 – Present · St. Petersburg, Russia

MSc. in Physics

St. Petersburg State University

Sep 2018 – June 2020

BSc. in Physics

St. Petersburg State University

Sep 2014 – June 2018

Master student in Machine Learning

Higher School of Economics

Sep 2020 – Present · St. Petersburg, Russia

PUBLICATIONS

Journal articles

- A. A. Kotov *et al.* Atoms **9**, 44 (2021)
- A. A. Kotov *et al.* X-Ray Spectrometry **49**, 110 (2020)

Conferences

- (2020). *17th SPARC workshop, poster, video conference*.
- (2019). *16th SPARC workshop, poster, Jena, Germany*.
- (2019). *PNPI 53th Annual Winter School 2019, talk, St. Petersburg, Russia*.
- (2019). *10 Years of G-RISC and Beyond, talk & poster, Berlin, Germany*.

HONOURS & AWARDS

- Master degree with honours in 2020
- Received stipend for excellent study and research results during master studying
- 2nd place in «Start-Up SPbU 2018»

SKILLS

Natural Languages: English, German
Programming Languages: Fortran, Python
Tools: Git, DIRAC, Intel OneAPI, MPI, OMP
Data Science Stack: pandas, numpy, scikit-learn, scipy
Neural Network Stack: PyTorch
Operating systems: Unix, MacOS, Windows

PROJECTS IN PHYSICS

Electronic structure of heavy few-electron diatomic quasimolecules, G-RISC

- Research on the configuration interaction method in the diatomic quasimolecules
- Development of the package to perform the electronic correlation calculation on the highest accuracy up-to-date.

Energy Spectra of Diatomic Quasimolecules

- Development of the numerical program for the electronic spectra calculation of the diatomic quasimolecules based on A-DKB B-Splines.
- Research and development of the package for the interelectronic interaction energy calculation.
- Optimization of the resource consumption by program up to 40% in RAM.

Super-heavy nuclei and atoms: mass limit of nuclei and boundary of the periodic table

- Property calculation of the super-heavy molecules and atoms such as dipole moment, polarizability, optimal geometry, etc.
- Calculation via coupled-cluster approach implemented in DIRAC.

PROJECTS IN ML

Makeup & Science

- Research and development of generative-adversarial network (GAN) application to makeup generation

- (2018). *19th International Conference on Physics of Highly Charged Ions*, *poster*, *Lisbon*, *Portugal*.
- (2018). *9th International Student Conference «Science and Progress-2018»*, *talk*, *St. Petersburg*, *Russia*.
- (2017). *8th International Student Conference «Science and Progress-2017»*, *poster*, *St. Petersburg*, *Russia*.