ARTEM KOTOV

PhD Student @ St. Petersburg State University

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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 chemistry 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

ACHIEVEMENTS

- 2nd place in «Start-Up SPbU 2018»

SKILLS

Natural Languages: German, English
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

EDUCATION / COURSES

PhD student

St. Petersburg State University

Sept 2020 – Present St. Petersburg, Russia

MSc. in Physics

St. Petersburg State University

Sept 2018 – June 2020

BSc. in Physics

St. Petersburg State University

Sept 2014 – June 2018

Master student in Machine Learning

Higher School of Economics

Sep 2020 – Present St. Petersburg, Russia

HONOURS & AWARDS

- Master degree with honours in 2020
- Received stipend for excellent study and research results during master studying

PROJECTS

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

- Research on the configuration interaction method to the electronic correlation calculation in the diatomic quasimolecules
- Development of the computational package to perform the electronic correlation calculation on the highest accuracy up-to-datebased on the A-DKB B-Spline program.

Energy Spectra of Diatomic Quasimolecules

- Development and modification of the numerical program for the electronic spectra calculation of the diatomic quasimolecules
- Research and development of the 1st-order quantum electrodynamics contribution of the inter-electronic interaction energy
- Optimization of the resource consumption by program

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: Program for Atomic and Molecular Direct Iterative Relativistic All-electron Calculations

Makeup & Science

- Research and development of generative-adversarial network (GAN) application to makeup generation
- Vectorization (makeup2vec) of the existing makeups made by real makeup artist

PUBLICATIONS

Journal Articles

- Kotov, A. A. et al. (2019). “Ground-State Energy of Uranium Diatomic Quasimolecules with One and Two Electrons.” In: *X-Ray Spectrometry* 49 (1), p. 110.

Conferences

- “Energy Spectra of Heavy Diatomic Homonuclear Quasimolecules” (2020). In: *17th SPARC workshop, poster, video conference*.
- “Ground and excited states energy of heavy diatomic homonuclear quasimolecules” (2019). In: *PNPI 53th Annual Winter School 2019, talk, St. Petersburg, Russia*.
- “Ground-State Energies of Heavy Diatomic Homonuclear Quasimolecules” (2019). In: *16th SPARC workshop, poster, Jena, Germany*.
- “Ground-state Energy of Heavy Diatomic Homonuclear Quasimolecules” (2019). In: *10 Years of G-RISC and Beyond, talk & poster, Berlin, Germany*.
- “Ground-state energy of heavy diatomic homonuclear quasimolecules” (2018). In: *9th International Student Conference «Science and Progress-2018», talk, St. Petersburg, Russia*.
- “Ground-State Energy of Uranium Diatomic Quasimolecules with One and Two Electrons.” (2018). In: *19th International Conference on Physics of Highly Charged Ions, poster, Lisbon, Portugal*.
- “Ground-state energy of heavy diatomic homonuclear quasimolecules” (2017). In: *8th International Student Conference «Science and Progress-2017», poster, St. Petersburg, Russia*.