

Postdoctoral Fellow in Advanced Energy Materials (Defects in Solar Energy Materials)

[HSE University](#)

[School of Electronic Engineering, MIEM](#)

Moscow, Russia

The School of Electronic Engineering (MIEM, HSE University) in Moscow, Russia, invites applications for postdoctoral research positions in the field of **Advanced Energy Materials**.

Defects in Solar Energy Materials

Combine density functional theory (DFT) calculations and machine learning (ML) methods to investigate the defects in solar cell materials. Simulate the defect structure evolution with the ML force field for longer trajectories to find rare events. Identify the impact of these events on photo-generated carrier recombination with DFT and quantum dynamics theory. The correlation between structural distortion and recombination dynamics is further analyzed with the ML models. This project is supposed to help understand and design advanced energy materials for solar cell, photocatalytic, and photoelectrochemical applications. For further reading see: Wei Li, Yalan She, Andrey S. Vasenko, Oleg V. Prezhdo. Ab initio nonadiabatic molecular dynamics of charge carriers in metal halide perovskites // *Nanoscale*. 2021. Vol. 13. No.23.P.10239-10265.

About HSE University

The Higher School of Economics (HSE University) is a young, dynamic and fast-growing Russian research university. Over the past 30 years, HSE University has become a leader in Russian education, while also being recognized globally.

For instance, we were the first state-run university in Russia to begin recruiting on the international academic market. We aim at being a university with a highly attuned approach to training new professionals. Therefore, we are eager to hire people with real experience, as well as basic and applied knowledge. Committed to high-quality research, HSE University now has more than 100 research institutes and centers and over 50 international research laboratories collaborating with international specialists from all over the world.

Requirements

The general requirements for the postdoctoral fellowship positions are the following:

- Candidates must hold a **recent PhD** in the field of Quantum chemistry, Energy Science and Engineering, Condensed matter theoretical physics or related areas which was awarded over the last **5 years** or received before starting work at HSE in a relevant field by an internationally recognized university and has been assessed by external reviewers as having the potential to pursue research that is publishable in leading peer-reviewed journals;

- Candidates should have a **strong background** in density functional theory (DFT) simulations using VASP and Quantum Espresso codes and the ability to work in a team;
- **Fluent English** is an obligatory condition as research and other activities are conducted in English. Knowledge of Russian is not required;
- Relevant experience in nonadiabatic molecular dynamics and machine learning methods will be an asset although not required.

The position involves:

- working under the direct supervision of [Prof. Andrey Vasenko](#);
- participants are encouraged to pursue their own research along with working on School of Electronic Engineering research projects such as:
 - o Photoinduced dynamics in novel nanoscale systems;
 - o Chemical interactions in charge and energy transfer at nanoscale interfaces.
- writing research papers for international peer-reviewed journals in co-authorship with Prof. Andrey Vasenko and other members of the School of Electronic Engineering (MIEM, HSE University);
- participation in the events of the School of Electronic Engineering and other contribution to the School of Electronic Engineering development;
- public presentations of candidate's own research to the academic community;
- some teaching is encouraged, though not required.

Conditions

Appointments are made for one year. Postdoctoral fellows have high opportunity of renewal of the contract (no more than two times) in case of outstanding performance.

HSE University offers postdoctoral fellows a competitive salary, the standard medical insurance plan, a working space equipped with a computer and free Internet access at the University.

- The School of Electronic Engineering in MIEM HSE offers access to HSE University cHARISMa supercomputer that operates at a peak computing rate of 2 petaFLOPS and possibility of using VASP codes.

Application Process

Applications must be submitted online. Please provide a CV, a statement of research interest and a recent research paper submitted via the online application form. At least two letters of recommendation should be sent directly to the International Faculty Recruitment Office at fellowship@hse.ru before the application deadline. Please note that direct applications to the hiring department may not be reviewed.

Read more about the application process [here](#).

The deadline for the applications is January 31, 2022.

[Apply now](#)

For more information:

- about Postdoctoral Fellowship -[Frequently Asked Questions](#);
- about HSE university –[official web-site](#);
- about the School of Electronic Engineering– official web-site of [the School of Electronic Engineering](#);
- about international specialists' life in Moscow -[International Faculty Support](#).

If you have any additional questions, feel free to contact the International Faculty Recruitment Office at fellowship@hse.ru