Hyukjoon Kwon

904-819, Gwanaksa, 599 Gwanak-ro, Gwanak-gu, Seoul, Republic of Korea
+82-10-4213-0327; bagho27@snu.ac.kr

Education

(Master's course) Seoul National University, Seoul, Republic of Korea   *Sep 2021 – Present*
> *Department of Nuclear Engineering*
> Computational Nuclear Material Laboratory (Supervisor: Takuji Oda)
> Academic Concentration: Atomistic Simulation
> Relevant Coursework: Path integral molecular dynamics, Forcefield development

(Bachelor's degree) Seoul National University, Seoul, Republic of Korea   *Mar 2015 – Aug 2021*

> *Bachelor of Economics*
> *Bachelor of Nuclear Engineering*

Researach experience

Laboratory Internship Program in Department of Nuclear Engineering   *Jul 2020 –Aug 2021*
- Invented efficient algorithms to estimate hydrogen diffusivity in metals including nuclear quantum effects

Joint Development Project of International Thermalnuclear Experimental Reactor (ITER)   *Mar 2022 – Present*
- Estimated the properties of liquid hydrogen by path integral molecular dynamics.

Joint Research with Samsung Electronics Co., Ltd.   *Jun 2022 – Present*
- Developed machine learning potentials for electronics-related metals by active learning.

Publication

(Under review in Acta Materialia)   *Sep 2022 – Present*
- (1st Author) *Accurate description of hydrogen diffusivity in bcc metals using machine-learning moment tensor potentials and path-integral methods*

Presentations

Japan-Korea Tritium Workshop   *Mar 2022*
- Title: *Application of machine learning potential to quantum diffusion of hydrogen isotopes in bcc metal: Machine Learning Path Integral Molecular Dynamics*

Academic Conference of the Korean Institute of Metals and Materials   *Apr 2022*
- Title: *Computational analysis on quantum diffusivity of hydrogen in bcc iron: Application of machine learning interatomic potential*

16th International Workshop on Hydrogen Isotopes in Fusion Reactor Materials   *Jun 2022*
- Title: *Quantum and isotope effects of hydrogen diffusivity and solubility in bcc metals*

Academic Conference of the Korea Accelerator and Plasma Research Association   *July 2022*
- Title: *Analysis on hydrogen diffusivity and solubility in Fe and W by molecular dynamics and machine learning potential model*

Awards

Quantum Information Center Awards (3rd award)
2022 Qhackathon by Ministry of Science and ICT of Korea   *Jun 2022*
- Presentation Title: *Analysis on optimal setting for quantum variational eigensolver (QVE)*
- A creative way was suggested to efficiently apply quantum computation for quantum chemistry calculation.

Technical skills

Computer programming
- Programming Languages: Fortran, C++, python
- Ability to design parallel computation algorithms

Atomistic Simulations
- Programs: LAMMPS, VASP, PIMD
- Ability to & modify open source codes (Fortran, C++).

Force Field Development
- Potential models: Embedded Atom Models (EAM), Moment Tensor Potential (MTP)
- Ability to develop machine learning potential for target systems.

Subjects of Interests

- **Quantum Physics**
- **Statistical Mechanics**
- **Materials Science and Engineering**
- **Computational Chemistry**

Military Service

Korea Army, Republic of Korea
Fire Direction Center (FDC) in Artillery Battalion   *Feb 2017 –Nov 2018*
- Honorably Discharged.