Chang Woo Kim, Ph.D.

Associate Professor, Department of Chemistry, Chonnam National University
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(as of July 17, 2026)

EDUCATION

Pohang University of Science and Technology (POSTECH) *Mar. 2008 – Feb. 2012*
B.S. in Chemistry with Honors

Pohang University of Science and Technology (POSTECH) *Sep. 2012 – Aug. 2018*
Ph.D. in Computational Physical Chemistry (Advisor: Prof. Young Min Rhee)

ACADEMIC CAREER AND PUBLIC SERVICE

Alternative Service for Military Duty *Sep. 2015 – Aug. 2018*
Technical Research Personnel for Republic of Korea Army

Korea Advanced Institute of Science and Technology (KAIST) *Sep. 2018 – Aug. 2019*
Postdoctoral Researcher (Advisor: Prof. Young Min Rhee)

University of Rochester *Sep. 2019 – Aug. 2021*
Postdoctoral Researcher (Advisor: Prof. Ignacio Franco)

Chonnam National University
Assistant Professor *Sep. 2021 – Aug. 2025*
Associate Professor *Sep. 2025 –*

RESEARCH INTEREST

- Quantum dynamics of complex chemical systems.
- Quantum algorithms for quantum dynamics.
- Machine learning-based force fields and its applications to chemical reactions.
- Advanced molecular dynamics techniques for analyzing enzymatic activities.

PUBLICATIONS

20. Gustin, I.; Kim, C.W.*; Franco, I. "General Framework for Quantifying Dissipation Pathways in Open Quantum Systems. III. Off-Diagonal Subsystem-Bath Couplings," *J. Chem. Phys.* **2026**, *164*, 034105.

19. Gustin, I.; Kim, C.W.; Franco, I.* "Dissipation Pathways in a Photosynthetic Complex," *J. Phys. Chem. Lett.* **2025**, *16*, 13093–13101.

18. 김창우; 김현우. "계산과학에서 양자 시뮬레이션의 활용," *물리학과 첨단기술* **2025**, *34* (6), 19–22.

17. Kim, C.W.*; Franco, I. "General Framework for Quantifying Dissipation Pathways in Open Quantum Systems. II. Numerical Validation and the Role of Non-Markovianity," *J. Chem. Phys.* **2024**, *160*, 214112.

16. Kim, C.W.*; Franco, I. "General Framework for Quantifying Dissipation Pathways in Open Quantum Systems. I. Theoretical Formulation," *J. Chem. Phys.* **2024**, *160*, 214111.

15. Gustin, I.; Kim, C.W.; McCamant, D.W.; Franco, I.* "Mapping Electronic Decoherence Pathways in Molecules," *Proc. Natl. Acad. Sci. U. S. A.* **2023**, *120*, e2309987120.

14. Singh, N.; Noh, G.H.; Mubarok, H.; Kim, C.W.; Lee, M.H.*; Lee, J.* "Synthesis and Photophysical Studies on Cyclometalated Iridium Complexes Containing Various Monodentate Phenyl-Azole Ancillary Ligands," *Polyhedron* **2022**, *227*, 116096.

13. Kim, C.W.* "Extracting Bath Information from Open-Quantum-System Dynamics with the Hierarchical Equations-of-Motion Method," *Phys. Rev. A* **2022**, *106*, 042223.

12. Kim, C.W.*; Nichol, J.M.; Jordan, A.N.; Franco, I.* "Analog Quantum Simulation of Open Quantum System Dynamics Based on Quantum Dots and Microelectronic Circuits," *PRX Quantum* **2022**, *3*, 040308.

11. Ki, H.; Jo, J.; Kim, Y.; Kim, T.W.; Kim, C.; Kim, Y.; Kim, C.W.; Muniyappan, S.; Lee, S.J.; Kim, Y.; Kim, H.M.; Yang, Y.; Rhee, Y.M.; Ihee, H.* "Uncovering the Conformational Distribution of a Small Protein with Nanoparticle-Aided Cryo-Electron Microscopy Sampling," *J. Phys. Chem. Lett.* **2021**, *12*, 6565–6573.

10. Kim, C.W.; Franco, I.* "Theory of Dissipation Pathways in Open Quantum Systems," *J. Chem. Phys.* **2021**, *154*, 084109.

9. Oh, I.; Lee, H.; Kim, T.W.; Kim, C.W.; Jun, S.; Kim, C.; Choi, E.H; Rhee, Y.M.*; Kim, J.*; Jang, W.-D.*; Ihee, H.* "Enhancement of Energy Transfer Efficiency Induced by Donor-to-Donor Energy Transfer in Multi-Chromophore Light-Harvesting Assembly: Role of Structural Heterogeneity," *Adv. Sci.* **2020**, *7*, 2001623.

8. Kim, T.W.; Lee, S.J.; Jo, J.; Kim, J.G.; Ki, H.S.; Kim, C.W.; Cho, K.; Choi, J.; Lee, J.H.; Narayanan, T.; Wulff, M.; Rhee, Y.M.*; Ihee, H.* "Protein Folding from Heterogeneous Unfolded States Revealed by Time Resolved X-ray Solution Scattering," *Proc. Natl. Acad. Sci. U. S. A.* **2020**, *117*, 14996-15005.

7. Kim, C.W.; Rhee, Y.M.* "Toward Monitoring the Dissipative Vibrational Energy Flows in Open Quantum Systems by Mixed Quantum-Classical Simulations," *J. Chem. Phys.* **2020**, *152*, 244109.

6. Kim, C.W.; Lee, W.-G.; Kim, I.; Rhee, Y.M.* "Effect of Underdamped Vibration on Excitation Energy Transfer: Direct Comparison between Two Different Partitioning Schemes," *J. Phys. Chem. A* **2019**, *123*, 1186–1197.

5. Kim, C.W.; Choi, B.S.; Rhee, Y.M.* "Excited State Energy Fluctuations in the Fenna-Matthews-Olson Complex from Molecular Dynamics Simulations with Interpolated Chromophore Potentials," *Phys. Chem. Chem. Phys.* **2018**, *20*, 3310–3319.

4. Kim, C.W.; Rhee, Y.M.* "Constructing an Interpolated Potential Energy Surface of a Large Molecule: A Case Study with Bacteriochlorophyll *a* Model in the Fenna-Matthews-Olson Complex," *J. Chem. Theory Comput.* **2016**, *12*, 5235–5246.

3. Kim, C.W.; Park, J.W.; Rhee, Y.M.* "Effect of Chromophore Potential Model on the Description of Exciton-Phonon Interactions," *J. Phys. Chem. Lett.* **2015**, *6*, 2875–2880.

2. Kim, O.; Kim, S.Y.; Ahn, H.; Kim, C.W.; Rhee, Y.M.*; Park, M.J.* "Phase Behavior and Conductivity of Sulfonated Block Copolymers Containing Heterocyclic Diazole-Based Ionic Liquids," *Macromolecules* **2012**, *45*, 8702–8713.

1. Park, S.W.; Kim, C.W.; Lee, J.H.; Shim, G.; Kim, K.S.* "Comparison of Arsenic Acid with Phosphoric Acid in the Interaction with a Water Molecule and an Alkali/Alkaline-Earth Metal Cation," *J. Phys. Chem. A* **2011**, *115*, 11355–11361.

ORAL PRESENTATIONS AND INVITED CONFERENCE TALKS

- Sep. 9–13, 2026. The East Asian Workshop on Chemical Dynamics (EAWCD), Hiroshima University, Hiroshima, Japan (expected).
- Jun. 15–19, 2026. New Advances in Theoretical and Computational Molecular Sciences for Complex and Quantum Processes (TMCQ 2026), KIAS, Seoul, South Korea.
- Dec. 16, 2025. Meeting of the Gwangju-Jeonnam Division of Korean Physical Society, Chosun University, Gwangju, South Korea.
- Nov. 28, 2025. The 62nd Meeting of the Korean Society for Imaging Science and Technology, Chonnam National University, Gwangju, South Korea.
- Aug. 25, 2025. Inaugural Meeting of the Korean Spin Chemistry Society, Sungkyunkwan University, Suwon, South Korea.
- Apr. 21–25, 2025. The 11th Conference of the Asia Pacific Association of Theoretical and Computational Chemists (APATCC-11), KICC, Kobe, Japan.
- Jun. 23–26, 2024. Summer Meeting of the Physical Chemistry Division of the Korean Chemical Society, Busan, South Korea.
- Apr. 21–23, 2024. Annual Meeting of the Quantum Information Society of Korea, BPEX, Busan, South Korea.
- Feb. 19–23, 2023. The 10th Conference of the Asia Pacific Association of Theoretical and Computational Chemists (APATCC-10), ICISE, Quy Nhon, Vietnam.
- Jun. 6–10, 2022. TSRC - Quantum Frontiers in Molecular Science, Telluride, USA.

- Nov. 9, 2021. Winter Meeting of the Physical Chemistry Division of the Korean Chemical Society, Ewha Woman's University, Seoul, South Korea.
- Jan. 9–12, 2019. The 4th China-Japan-Korea Workshop on Theoretical & Computational Chemistry (CJK-WTCC4), Nanjing University, Nanjing, China.
- Oct. 17–19, 2018. The 122nd Korean Chemical Society General Meeting, EXCO, Daegu, South Korea.
- Apr. 20–22, 2016. The 117th Korean Chemical Society General Meeting, KINTEX, Ilsan, South Korea.

SERVICE FOR PEER-REVIEWED JOURNALS

- Journal of Korean Chemical Society.
- Bulletin of Korean Chemical Society.
- Journal of Chemical Physics.
- The Journal of Physical Chemistry B.
- The Journal of Physical Chemistry Letters.

HONORS AND AWARDS

- Teaching Excellence Award, Chonnam National University. *2024*
- Global Ph.D. Fellowship, National Research Foundation of Korea. *2013–2015*
- Kim Wook Merit Scholarship, Department of Chemistry, POSTECH. *2009*