

Prof. Dr. Stefan Ringe

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Curriculum Vitae

Education

- 06/2013–
05/2017 **Ph.D. in Computational Chemistry**, *Technical University Munich (Germany)*
Prof. Dr. Karsten Reuter, “*Summa Cum Laude*”
- 10/2010–
03/2013 **M.Sc. in Chemistry**, *Georg-August University Göttingen (Germany)*
“*With Honors*”
- 10/2007–
09/2010 **B.Sc. in Chemistry**, *Georg-August University Göttingen (Germany)*
“*With Honors*”

Professional Experience

- 9/2024–
present **Associate Professor**, *Korea University (Rep. of Korea)*
Department of Chemistry
- 02/2022–
8/2024 **Assistant Professor**, *Korea University (Rep. of Korea)*
Department of Chemistry
- 02/2022–
present **Research Fellow**, *Institute for Basic Science (IBS) (Rep. of Korea)*
Center for Molecular Spectroscopy and Dynamics
- 02/2020–
02/2022 **Assistant Professor**, *DGIST (Rep. of Korea)*
Department of Energy Science & Engineering
- 02/2019–
02/2020 **Postdoctoral Research Scholar**, *KAIST (Rep. of Korea)*
Prof. Dr. Hyungjun Kim
- 07/2017–
01/2019 **Postdoctoral Research Scholar**, *Stanford University (USA)*
Prof. Dr. Jens Nørskov

Research Interests

- **Computational Design for Sustainable Energy Conversion:** CO₂ reduction, water oxidation (oxygen evolution reaction – OER) and reduction (hydrogen evolution reaction – HER), oxygen reduction reaction (fuel cell), NO reduction. . . .
- **Electrified Solid-Liquid Interface Engineering:** Solid-liquid interface electrification and its influence on electrochemical reaction kinetics.
- **Machine Learning:** Development of *ab initio*-based machine learning techniques for modeling molecular dynamics at electrified solid-liquid interfaces and high-throughput screening of electrocatalysts.
- **Multi-scale Modeling of Electrochemical Systems:** Mass transport, buffer reactions, electrolyte design, porous electrodes.

Awards

- 2023-2024 **Fellowship of the Cluster of Excellence Sustainable and Energy-Efficient Aviation (SE2A)**, SE2A/TU Braunschweig, Braunschweig (Germany)
- 2019 **Award for Outstanding Oral Presentation**, 130th Physical Chemistry Summer Symposium, Busan (Rep. of Korea)
- 2016 **DAAD scholarship (Kongressreise)**, 67th Annual Meeting of the ISE, The Hague (Netherlands)
- 2014 **Selection for Global Young Scientist Summit**, *Singapore National University of Singapore* (Singapore)
- 2013 **Award for Outstanding Graduation**, *Georg-August University Göttingen* (Germany), awarded by chemistry department
- 2012 **Award for Outstanding Teaching**, *Georg-August University Göttingen* (Germany), awarded by students
- 2010,2011,2012 **Scholarship of Lower Saxony**
- 2010 **Otto Wallach Award**, *Georg-August University Göttingen* (Germany), best B.Sc. degree in chemistry
- 2007 **GDCh Award**, *Halepaghen-Gymnasium Buxtehude*, best graduation in chemistry (German Society of Chemistry)

Teaching and Mentoring Experience

- 2022– **Mentoring/Supervision**, *Korea University* (Rep. of Korea), Master students (4), Integrated/PhD students (5), Postdocs (3)
- 2020–2022 **Mentoring/Supervision**, *DGIST* (Rep. of Korea), Master students (2, 2 graduated)
- 2014–2020 **Mentoring/Supervision**, *Technical University Munich* (Germany), Master students (4), PhD students (2)

- 2020– **Lecturer**, *Technical University Munich (Germany)*,
General chemistry, Thermodynamics (basic and advanced courses), Quantum chemistry, Computational chemistry (basic and advanced courses), AI and chemistry
- 10/2013– **Tutor**, *Technical University Munich (Germany)*,
09/2016 Mathematics, computational & theoretical chemistry, molecular simulations, thermodynamics, numerical methods, spectroscopy

Scientific Achievements

- Activities**
- 10/2024 Organization committee of the *L06-Electrocatalysis at the Interface 2* symposium at ECS PRiME, Hawaii, USA
 - 7/2024 Organization committee of the *Computational Materials and Data Science for Nanotechnology* symposium at Nano Korea 2025, Ilsan, Rep. of Korea
 - 4/2023 Organizer of the BK21 Germany-Korea On-Site Plenary Discussion on Computational Electrochemistry, Korea University, Rep. of Korea
 - 03/2024-present International student affairs coordinator of the College of Science, Korea University
 - 11/2022 Organizer of the BK21 online symposium on *International Symposium on Chemical Applications of Machine Learning*, Korea University, Rep. of Korea
- Selected invited talks**
- 06/2024 USTC School on Electrochemistry (online) [Lecture 1](#), [Lecture 2](#), [Lecture 3](#)
 - 04/2024 [87th Annual Conference of the DPG and DPG Spring Meeting, Berlin](#) (Germany)
 - 03/2024 Data-driven materials modeling, Ewha University, Seoul (Rep. of Korea)
 - 01/2024 [Lorentz Center Workshop on Atomistic Modelling of Solid-Liquid Interfaces in Electrocatalysis](#)
 - 06/2023 [Canadian Chemistry Conference and Exhibition, Vancouver](#) (Canada)
 - 03/2023 1st Y-KAST International Conference, Jeju Shinhwa World, Jeju (Rep. of Korea)
 - 02/2023 [SIAM Conference on Computational Science and Engineering \(CSE23\), RAI Congress Centre, Amsterdam](#) (Netherlands)
 - 02/2023 [Virtual Winterschool on Computational Chemistry](#) (online)
 - 11/2020 6th International Conference on Electronic Materials and Nanotechnology for Green Environment (ENGE), Jeju (Rep. of Korea)
 - 09/2020 2020 Pacific Rim Meeting of electrochemical and solid state science (PRIME), Online
 - 07/2018 [FHI-aims Developer & User Meeting](#), *Technical University Munich* (Germany)
- Paper reviews** Over 30 peer reviews/year for various SCI journals, such as *Nature Catal.*, *Nature Energy*, *Angew. Chem. Int. Ed.*, *Joule*, *Adv. Energy Mater.*, *Nature Comm.*, etc.

Selected publications († = The authors contributed equally to this work; * = Corresponding author.)

- 1 B. Jeong†*, H. G. Abbas†, B. P. Klein†, G. Bae, A. R. Velmurugan, C. H. Choi, G. Kim, D. Kim, K.-J. Kim, B. J. Cha, Y. D. Kim, F. Jaouen, R. J. Maurer*, S. Ringe*, *CO cryo-sorption as a surface-sensitive spectroscopic probe of the active site density of single-atom catalysts*, *Angew. Chem. Int. Ed Engl.* **2025**, 64, e202420673, DOI: [10.1002/anie.202420673](https://doi.org/10.1002/anie.202420673).
- 2 M. Park, S. Cho, J. Yang, V. W.-H. Lau, K. H. Kim, J. H. Park*, S. Ringe*, Y.-M. Kang*, *Heterogeneous Catalyst as a Functional Substrate Governing the Shape of Electrochemical Precipitates in Oxygen-Fueled Rechargeable Batteries*, *J. Am. Chem. Soc.* **2023**, 145, 15425–15434, DOI: [10.1021/jacs.3c03619](https://doi.org/10.1021/jacs.3c03619).
- 3 S. Ringe, *The importance of a charge transfer descriptor for screening potential CO₂ reduction electrocatalysts*, *Nat. Commun.* **2023**, 14, 2598, DOI: [10.1038/s41467-023-37929-4](https://doi.org/10.1038/s41467-023-37929-4).
- 4 S. Hong†, H. G. Abbas†, K. Jang†, K. K. Patra, B. Kim, B.-U. Choi, H. Song, K.-S. Lee, P.-P. Choi, S. Ringe*, J. Oh*, *Tuning the C1 /C2 Selectivity of Electrochemical CO₂ Reduction on Cu-CeO₂ Nanorods by Oxidation State Control*, *Adv. Mater.* **2023**, 35, e2208996, DOI: [10.1002/adma.202208996](https://doi.org/10.1002/adma.202208996).
- 5 S. Ringe†*, N. G. Hörmann†, H. Oberhofer, K. Reuter*, *Implicit Solvation Methods for Catalysis at Electrified Interfaces*, *Chem. Rev.* **2022**, 122, 10777–10820, DOI: [10.1021/acs.chemrev.1c00675](https://doi.org/10.1021/acs.chemrev.1c00675).
- 6 D. H. Kim†, S. Ringe†, H. Kim, S. Kim, B. Kim, G. Bae, H.-S. Oh, F. Jaouen, W. Kim*, H. Kim*, C. H. Choi*, *Selective electrochemical reduction of nitric oxide to hydroxylamine by atomically dispersed iron catalyst*, *Nat. Commun.* **2021**, 12, 1–11, DOI: [10.1038/s41467-021-22147-7](https://doi.org/10.1038/s41467-021-22147-7).
- 7 S. Ringe†*, C. G. Morales-Guio†, L. D. Chen, M. Fields, T. F. Jaramillo, C. Hahn, K. Chan*, *Double layer charging driven carbon dioxide adsorption limits the rate of electrochemical carbon dioxide reduction on Gold*, *Nat. Commun.* **2020**, 11, 1–11, DOI: [10.1038/s41467-019-13777-z](https://doi.org/10.1038/s41467-019-13777-z).
- 8 C. Xia†, S. Back†, S. Ringe†, K. Jiang, F. Chen, X. Sun, S. Siahrostami*, K. Chan*, H. Wang*, *Confined local oxygen gas promotes electrochemical water oxidation to hydrogen peroxide*, *Nature Catalysis* **2020**, DOI: [10.1038/s41929-019-0402-8](https://doi.org/10.1038/s41929-019-0402-8).
- 9 S. Ringe†*, E. L. Clark†, J. Resasco, A. Walton, B. Seger, A. T. Bell, K. Chan*, *Understanding cation effects in electrochemical CO₂ reduction*, *Energy Environ. Sci.* **2019**, 12, 3001–3014, DOI: [10.1039/C9EE01341E](https://doi.org/10.1039/C9EE01341E).
- 10 S. Ringe, H. Oberhofer*, C. Hille, S. Matera, K. Reuter, *Function-Space-Based Solution Scheme for the Size-Modified Poisson-Boltzmann Equation in Full-Potential DFT*, *J. Chem. Theory Comput.* **2016**, 12, 4052–4066, DOI: [10.1021/acs.jctc.6b00435](https://doi.org/10.1021/acs.jctc.6b00435).