

Research

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Research

KUMAGAI, Takashi

Associate Professor

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Research Group List

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E-Mail : kuma_at_ims.ac.jp (Please replace the "_at_" with @)

Location: Myodaiji

Affiliation laboratory > [KUMAGAI Group](#)Lab WebSite: <https://kumagai.ims.ac.jp/>

Department

Center for Mesoscopic Sciences, Division of Broadband Multiscale Analysis

Biography

2006 B.S. Ritsumeikan University

2011 Ph.D. Kyoto University

2008 JSPS Research Fellow, Kyoto University

2011 JSPS Research Fellow, Fritz-Haber Institute

2013 Group leader, Fritz-Haber Institute

2020 Associate Professor, Institute for Molecular Science (additional post) (-2021.3)

2020 Guest Professor, Hokkaido University

2021 Associate Professor, Institute for Molecular Science

Associate Professor, The Graduate University for Advanced Studies

Awards

2013 Inoue Research Award for Young Scientists

2014 Morino Award for Molecular Science

2016 Gerhard Ertl Young Investigator Award

2020 Gaede Prize

2020 Young Scientists' Prize for the Commendation for Science and Technology by the Minister of Education, Culture, Sports, Science and Technology

2020 Heinrich Rohrer Medal

Main research themes

Open a new frontier of nano-science using state-of-the-art scanning probe microscopy

Keywords Scanning probe microscopy, Nanoscale optical spectroscopy, Plasmonics, Single-molecule chemistry, Hydrogen dynamics, Molecular electronics

 [Annual Review : PDF](#)

Selected Publications

1. S. Liu, A. Hammud, I. Hamada, M. Wolf, M. Müller, T. Kumagai, Nanoscale coherent phonon spectroscopy. *Sci. Adv.* **8**, eabq5682 (2022).
2. B. Cirera, M. Wolf, T. Kumagai, Joule Heating in Single-Molecule Point Contacts Studied by Tip-Enhanced Raman Spectroscopy. *ACS Nano* **16**, 16443 (2022).
3. S. Liu, M. Wolf, T. Kumagai, Nanoscale Heating of an Ultrathin Oxide Film Studied by Tip-Enhanced Raman Spectroscopy. *Phys. Rev. Lett.* **128**, 206803 (2022).
4. B. Cirera, Y. Litman, C. Lin, A. Akkoush, A. Hammud, M. Wolf, M. Rossi, T. Kumagai, Charge Transfer-Mediated Dramatic Enhancement of Raman Scattering upon Molecular Point Contact Formation. *Nano Lett.* **22**, 2170 (2022).
5. S. Liu, B. Cirera, Y. Sun, I. Hamada, M. Müller, A. Hammud, M. Wolf, T. Kumagai, Dramatic enhancement of tip-enhanced Raman scattering mediated by atomic point contact formation. *Nano Lett.* **20**, 5879 (2020).
6. S. Liu, M. Müller, Y. Sun, I. Hamada, A. Hammud, M. Wolf, T. Kumagai, Resolving the Correlation between Tip-Enhanced Resonance Raman Scattering and Local Electronic States with 1 nm Resolution. *Nano Lett.* **19**, 5725–5731 (2019).
7. H. Böckmann, S. Liu, M. Müller, A. Hammud, M. Wolf, T. Kumagai, Near-Field Manipulation in a Scanning Tunneling Microscope Junction with Plasmonic Fabry-Pérot Tips. *Nano Lett.* **19**, 3597–3602 (2019).
8. H. Böckmann, S. Gawinkowski, J. Waluk, M.B. Raschke, M. Wolf, T. Kumagai, Near-Field Enhanced Photochemistry of Single Molecules in a Scanning Tunneling Microscope Junction. *Nano Lett.* **18**, 152–157 (2018).
9. S. Liu, M. Wolf, T. Kumagai, Plasmon-Assisted Resonant Electron Tunneling in a Scanning Tunneling Microscope Junction. *Phys. Rev. Lett.* **121**, 226802 (2018).
10. M. Koch, M. Pagan, M. Persson, S. Gawinkowski, J. Waluk, T. Kumagai, Direct Observation of Double Hydrogen Transfer via Quantum Tunneling in a Single Porphycene Molecule on a Ag(110) Surface. *J. Am. Chem. Soc.* **139**, 12681–12687 (2017).
11. J. N. Ladenthin, T. Frederiksen, M. Persson, J. C. Sharp, S. Gawinkowski, J. Waluk, T. Kumagai, Force-induced tautomerization in a single molecule. *Nature Chemistry* **8**, 935–940 (2016).
12. T. Kumagai, F. Hanke, S. Gawinkowski, J. Sharp, K. Kotsis, J. Waluk, M. Persson, L. Grill, Controlling intramolecular hydrogen transfer in a porphycene molecule with single atoms or molecules located nearby. *Nature Chemistry* **6**, 41–46 (2014).
13. T. Kumagai, A. Shiotari, H. Okuyama, S. Hatta, T. Aruga, I. Hamada, T. Frederiksen, H. Ueba, Hydrogen relay reactions in real space. *Nature Materials* **11**, 167–172 (2012).

› Awards & Honors

› International collaboration

Links

