

Curriculum Vitae (as of 30th Sep. 2021)

Hiroshi Imada

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EDUCATION

Tokyo Institute of Technology, Ph.D	Condensed Matter Physics	2010
Tokyo, Japan		
Tokyo Institute of Technology, MS	Condensed Matter Physics	2006
Tokyo, Japan		
Tokyo Institute of Technology, BS	Physics	2004
Tokyo, Japan		

DISSERTATION

“Atom-resolved scanning tunneling luminescence of surface structures”
(Advisors: Professor Naoki Yamamoto, Professor Kunio Takayanagi)

PROFESSIONAL POSITIONS

- Postdoctoral researcher, Surface and Interface Science Laboratory, RIKEN, Japan, May 2010 to March 2017.
- Research scientist, Surface and Interface Science Laboratory, RIKEN, Japan, Apr. 2017 to Present.
- Senior Research scientist, Surface and Interface Science Laboratory, RIKEN, Japan, Apr. 2020 to Present.
- Adjunct Associate Professor, Department of Applied Chemistry, Kyushu University, Japan, Apr. 2018 to Present
- PRESTO Researcher, JST, Japan, Oct. 2018 to Present

AWARD AND HONORS

- The 8th RIKEN Research Incentive Award (Mar. 2017).
- Young Researcher Award, The Surface Science Society Japan (May, 2017).
- RIKEN BAIHO Award (Jun. 2018)
- Nanoprobe technology award, Gakushin 167 committee Japan (Jul. 2018)
- The 13rd Young Scientist Award of the Physical Society of Japan, The Physical Society of Japan (Mar. 2019)
- JVSS Journal award, The Japan Society of Vacuum and Surface Science (Oct. 2019)
- The Young Scientists' Award, MEXT Japan, (Apr. 2021)

SCIENTIFIC PUBLICATIONS (Original papers)

- “Visualization of Frontier Molecular Orbital Separation of a Single Thermally Activated Delayed Fluorescence Emitter by STM”
I. Zoh, M. Imai-Imada, J. Bae, H. Imada, Y. Tsuchiya, C. Adachi, Y. Kim*
J. Phys. Chem. Lett. 12 (2021) 7512–7518
- **Main publication 1**
“Single-molecule laser nanospectroscopy with micro–electron volt energy resolution”
H. Imada*, M. Imai-Imada, K. Miwa, H. Yamane, T. Iwasa, Y. Tanaka, N. Toriumi, K. Kimura, N. Yokoshi, A. Muranaka, M. Uchiyama, T. Taketsugu, Y. K. Kato, H. Ishihara, Y. Kim*.
Science, 373 (2021) 95-98.
as a co-corresponding author
- “Chemical Identification and Bond Control of π -Skeletons in a Coupling Reaction”
C. Zhang, R. B. Jaculbia, Y. Tanaka, E. Kazuma, H. Imada, N. Hayazawa, A. Muranaka, M. Uchiyama, Y. Kim*.
J. Am. Chem. Soc., 143 (2021) 9461-9467.
- “Terahertz-Field-Driven Scanning Tunneling Luminescence Spectroscopy”
K. Kimura, Y. Morinaga, H. Imada*, I. Katayama*, K. Asakawa, K. Yoshioka, Y. Kim*, J. Takeda*.
ACS Photonics, 8 (2021) 982–987.
as a co-corresponding author
- **Main publication 2**
“Single molecule resonance Raman effect in a plasmonic nanocavity”
R. Jaculbia, H. Imada*, K. Miwa, T. Iwasa, M. Takenaka, B. Yang, E. Kazuma, N. Hayazawa*, T. Taketsugu, Y. Kim*
Nature Nanotechnology, 15 (2020) 105–110.
as a co-corresponding author
- “Self-assembly growth of an upright molecular precursor with a rigid framework”
S. Chaunchaiyakul, C. Zhang, H. Imada, E. Kazuma, F. Ishiwari, Y. Shoji, T. Fukushima, Y. Kim
J. Phys. Chem. C, 123 (2019) 31272–31278.
- **Main publication 3**
“Selective triplet exciton formation in a single molecule”
K. Kimura, K. Miwa, H. Imada*, M. Imai-Imada, S. Kawahara, J. Takeya, M. Kawai, M. Galperin*, Y. Kim*
Nature 570 (2019) 210-213.
as a co-corresponding author
- “Organic molecular tuning of many-body interaction energies in air-suspended carbon nanotubes”
S. Tanaka, K. Otsuka, K. Kimura, A. Ishii, H. Imada, Y. Kim, Y. K. Kato
J. Phys. Chem. C 123 (2019) 5776-5781.
- “Many-body states description of single-molecule electroluminescence driven by scanning tunneling microscope”
K. Miwa, H. Imada, M. Imai-Imada, K. Kimura, M. Galperin, Y. Kim
Nano Lett. 19 (2019) 2803-2811.
- “Energy-level alignment of a single molecule on ultrathin insulating film”
M. Imai-Imada, H. Imada, K. Miwa, J. Jung, T. K. Shimizu, M. Kawai, Y. Kim
Phys. Rev. B 98 (2018) 201403(R), 1-6.
- **Main publication 4**
“Single-molecule investigation of energy dynamics in a coupled plasmon-exciton system”
H. Imada, K. Miwa, M. Imai-Imada, S. Kawahara, K. Kimura and Y. Kim

Phys. Rev. Lett. 119 (2017) 013901

• **Main publication 5**

“Real-space investigation of energy transfer in heterogeneous molecular dimers”

H. Imada, K. Miwa, M. Imai-Imada, S. Kawahara, K. Kimura and Y. Kim

Nature 538 (2016) 364-367.

- “Effects of molecule-insulator interaction on geometric property of a single phthalocyanine molecule adsorbed on an ultrathin NaCl film”
K. Miwa, H. Imada, S. Kawahara, and Y. Kim
Phys. Rev. B 93 (2016) 165419, 1-8.
- “Direct visualization of surface phase of oxygen molecules physisorbed on Ag(111) surface: A two-dimensional quantum spin system”
S. Yamamoto, Y. Yoshida, H. Imada, Y. Kim, and Y. Hasegawa
Phys. Rev. B 93 (2016) 081408(R).
- “Atomic-scale luminescence measurement and theoretical analysis unveiling electron energy dissipation at a *p*-type GaAs(110) surface”
H. Imada, K. Miwa, J. Jung, T. K. Shimizu, N. Yamamoto, and Y. Kim
Nanotechnology 26 (2015) 365402. [Selected as Nanotechnology Select]
- “Nonequilibrium Green's function theory of scanning tunneling microscope-induced light emission from molecule covered metal surfaces: effects of coupling between exciton and plasmon modes”
K. Miwa, H. Imada, M. Sakaue, H. Kasai, Y. Kim
e-J. Surf. Sci. Nanotech. 13 (2015) 385-390.
- “Supramolecular assembly through interactions between molecular dipoles and alkali metal ions”
T. K. Shimizu, J. Jung, H. Imada, Y. Kim
Angew. Chem. Int. Ed. 53 (2014) 13729-13733
- “Adsorption-induced stability reversal of photochromic diarylethene on metal surfaces”
T. K. Shimizu, J. Jung, H. Imada, Y. Kim
Chem. Commun. 49 (2013) 8710-8712.
- “Atom-Resolved Luminescence of Si(111)-7×7 Induced by Scanning Tunneling Microscopy”
H. Imada, M. Ohta, N. Yamamoto
Appl. Phys. Express 3 (2010) 045701.

Invited Talks (international conference)

- “Precise investigation of the resonance state of a single molecule in a plasmonic nanocavity”
Pacifichem 2021, Dec. 16-21 (2021)
- “Single molecule investigation of energy absorption, emission, and transfer dynamics with a scanning tunneling microscope”
Nano Korea 2017, Gyeonggi-do, Korea, 11th-14th July (2017).
- “Spectroscopic investigation of single molecule energy dynamics with a scanning tunneling microscope”
NANOPIA 2017, Gyeongsangnam-do, Korea, 8th-10th November (2017).
- “STM study of exciton creation and annihilation in a single molecule”
The 81st Okazaki Conference, Okazaki, Dec. 2-4 (2019)
- “Plasmon-exciton coupling at an STM junction: fundamental and applications for spatially-resolved single-molecule spectroscopy”
27th International Colloquium on Scanning Probe Microscopy (ICSPM27), Izu, Dec. 5-7 (2019)

RESEARCH INTERESTS

- Scanning probe microscopy
- Energy dynamics and conversion
- Quantum coherence in nano-systems
- Heterogeneous systems
- Nano spectroscopy
- Single-molecule/atom optical manipulation
- Absorption/emission/Raman/ultrafast spectroscopy