

Yujin Park

Curriculum Vitae

EDUCATION

- Korea Advanced Institute of Science and Technology (KAIST), Daejeon, South Korea** 2019~2023
- M.S. and Ph.D. in Chemistry, Advisor: Prof. Jeong Young Park
 - Thesis title: Investigation of Plasmonic Hot-Carrier Flow Based on Spatial and Temporal-Resolution Analysis in Metal/Semiconductor Structures
- Korea Advanced Institute of Science and Technology (KAIST), Daejeon, South Korea** 2017~2019
- M.S. in Graduate School of EEWS, Advisor: Prof. Jeong Young Park
 - Thesis title: Enhanced Hot Electron Generation on MAPbI₃ Modified Plasmonic Nanodiode
- Hongik University, Seoul, South Korea** 2013~2017
- B.S. in Materials Science and Engineering

RESEARCH CAREER

- University of Texas at Austin, Austin, USA** 2023~present
- Postdoctoral Fellow in Chemical Engineering, Advisor: Prof. Delia J. Milliron

RESEARCH INTERESTS

KEYWORDS: Plasmonics, Energy Conversion, Metamaterials, Colloidal Nanocrystals, Assemblies

- Understanding Light-Matter Interactions on Plasmonic Nanomaterials
- Understanding Electronic Excitation during Energy Dissipation and Conversion at Extreme Spatial and Temporal Limits

RESEARCH EXPERIENCES

- University of Texas at Austin, Austin, USA**
- Postdoctoral Fellow* / McKetta Department of Chemical Engineering 2023~present
- **PI:** Prof. Delia J. Milliron
 - Colloidal Metal Oxide Assemblies for Plasmonic Hyperbolic Metamaterials
 - Collective Plasmon Resonance Behavior in Hierarchically Doped Plasmonic Nanocrystal Metamaterials
- Korea Advanced Institute of Science and Technology (KAIST), Daejeon, South Korea**
- M.S. & Ph.D.* / Graduate School of EEWS & Department of Chemistry 2017~2023
- **PI:** Prof. Jeong Young Park
 - Understanding the Correlation between Hot-Carrier Flux and Lifetime on Perovskite Plasmonic Metal Structure: from Macroscopic Detection to Nanoscopic Analysis
- Hongik University, Seoul, South Korea**
- Undergraduate Research Assistant* / Department of Materials Science and Engineering 2015~2017
- **PI:** Prof. Byoungnam Park
 - Research on the Effect of Transport and Energetic Level Engineering on Photo-electrochemical Properties.
- Industry-university Research Internship* / Department of Materials Science and Engineering Summer 2015
- **PI:** Prof. Byoungnam Park
 - Research on the Electrical and Optical Properties of Spin-Coated Perovskite Films.
- Korea Foundation for the Advancement of Science & Creativity**
- Undergraduate Research Program* 2015~2016
- **PI:** Prof. Byoungnam Park
 - Research on the Electrical and Optical Properties of Vapor-Deposited Perovskite Films.

PUBLICATIONS

(First-author list)

1. **Yujin Park**, Un Jeong Kim*, and Moonsang Lee* "Reversal photoconductivity in Si nanowire-based P3HT Ferroelectric phototransistor" (*In preparation*)
2. Hyunhwa Lee,† **Yujin Park**,‡ Sanghee Nah, Mincheol Kang, Moonsang Lee,* and Jeong Young Park* "Reconfiguring Hot-Hole Flux via Polarity Modulation of p-GaN in Plasmonic Schottky Architectures" (†Equal contribution) (*Submitted*)
3. **Yujin Park**, Jihyang Park, Yeonghoon Jin, Yujin Roh, Hyunhwa Lee, Kyoungsik Yu, Moonsang Lee,* and Jeong Young Park* "Simultaneous Harvesting of Bipolar Plasmonic Hot Carriers for Superior Photoconductivity in Ag Nanoprism-Coupled Lateral Si *p-n* Junction" (*under revision*)
4. Jihyang Park,† **Yujin Park**,‡ Kyoung Su Lee, Un Jeong Kim,* Eun Kyu Kim,* and Moonsang Lee* "Pushing the Limits of Photoconductivity via Hot Electrons in Deep Trap States in Plasmonic Architectures" (†Equal contribution) *Nano Letters* (*In press*) (2024), IF=9.6
5. **Yujin Park**,‡ Jungkweon Choi,‡ Daehan Kim,‡ Jungmin Kim, Yujin Roh, Hyunhwa Lee, Dae Won Cho, Byungha Shin,* Hyotcherl Ihee,* and Jeong Young Park* "Engineering Perovskite Bandgap for Control of Hot-Electron Dynamics in Plasmonic Nanodiodes" (†Equal contribution) *Solar RRL*, 2400433 (2024), IF=6
6. Hyunhwa Lee,† **Yujin Park**,‡ Kyoungjae Song, and Jeong Young Park* "Surface Plasmon-Induced Hot Carriers: Generation, Detection, and Applications" *Accounts of Chemical Research*, 55, 3727-3737 (2022) (†Equal contribution), IF=24.466
7. **Yujin Park**,‡ Jungkweon Choi,‡ Mincheol Kang, Hyunhwa Lee, Hyotcherl Ihee,* and Jeong Young Park* "Relaxation Dynamics of Enhanced Hot-Electron Flow on Perovskite Coupled Plasmonic Silver Schottky Nanodiode" *The Journal of Physical Chemistry C*, 124, 2575-2582 (2021) (†Equal contribution), IF=4.126
8. **Yujin Park**, Jungkweon Choi, Changhwan Lee, An-Na Cho, Dae Won Cho, Nam-Gyu Park, Hyotcherl Ihee,* and Jeong Young Park* "Elongated Lifetime and Enhanced Flux of Hot Electrons on Perovskite Plasmonic Nanodiode" *Nano Letters*, 19, 5489-5495 (2019), IF=11.238
9. **Yujin Park**, and Byoungnam Park* "Interfacial Energy Band Bending and Carrier Trapping at the Vacuum-Deposited MAPbI₃ Perovskite/Gate Dielectric Interface", *Results in Physics*, 11, 302-305 (2018), IF=3.042
10. **Yujin Park**, and Byoungnam Park* "Effect of Ligand Exchange on Photocurrent Enhancement in Cadmium Selenide (CdSe) Quantum Dot Water Splitting Cells", *Results in Physics*, 11, 162-165 (2018), IF=3.042

(Co-author list)

11. Yujin Roh, Yeonghoon Jin, Beomjoon jeon, **Yujin Park**, Kyoungsik Yu, and Jeong Young Park* "Revealing the Loss Mechanism of Chemically-Induced Hot Electron Transport" *Nano Letters* 24, 3490 (2024), IF=9.6
12. Hyunhwa Lee,† Passarut Boonmongkolras,‡ Seongmoon Jun, Daehan Kim, **Yujin Park**, Jaehyuk Ko, Yong-Hoon Cho, Byungha Shin,* and Jeong Young Park* "In Situ Observation of Photo-Induced Halide Segregation in Mixed Halide Perovskite" *ACS Applied Materials & Interfaces* 6, 1565 (2023), IF=6.959
13. Si Woo Lee, Hyunhwa Lee, **Yujin Park**, Heeyoung Kim, Gabor A. Somorjai,* and Jeong Young Park* "Surface Chemistry of Hot Electron and Metal-Oxide Interfaces" *Surface Science Reports* 76, 100532 (2021), IF=12.267
14. Mincheol Kang, **Yujin Park**, Hyunhwa Lee, Changhwan Lee, and Jeong Young Park* "Manipulation of Hot Electron Flow on Plasmonic Nanodiodes Fabricated by Nanosphere Lithography" *Nanotechnology* 32, 225203 (2021), IF=3.874

15. Changhwan Lee, **Yujin Park**, and Jeong Young Park* "Hot Electrons Generated by Intraband and Interband Transition Detected Using a Plasmonic Cu/TiO₂ Nanodiode" *RSC Advances*, 9, 18371-18376 (2019), IF=3.119
16. Changhwan Lee, Young Keun Lee, **Yujin Park**, and Jeong Young Park* "Polarization Effect of Hot Electrons in Tandem-Structured Plasmonic Nanodiode" *ACS Photonics*, 5, 3499-3506 (2018), IF=6.864
17. Seongeun Cho, Youngjun Kim, Minkyong Kim, Jin-A Kim, Kihyun Kim, **Yujin Park**, Soojin Han, Chang-Yeol Han, Jong-Hoon Kim, Jun Yeon Hwang, Jun-Young Park, Eugene Kim, Heesun Yang, and Byoungnam Park* "Quantized Interfacial Properties at Lead Sulfide/Zn_{1-x}Mg_xO Energy Harvesting Assembly: Formation of Nanocrystal Solid Solution", *Solar Energy Materials and Solar Cells*, 164, 156-164 (2017), IF=5.018
18. Seongeun Cho, Youngjun Kim, **Yujin Park**, Miri Choi, Jun-young Park, Jihoon Lee, Sungyoung Park, Mincheol Chang, Jiung Cho, Insik In, and Byoungnam Park* "Tunable Exciton Dissociation and Luminescence Quantum Yield in a Quasi-Ordered Regioregular Polythiophene", *The Journal of Physical Chemistry C*, 120, 26119-26128 (2016), IF=4.536

PRESENTATIONS

(International conferences)

1. **Yujin Park**, Jungkweon Choi, Mincheol Kang, Hyunhwa Lee, Hyotcherl Ihee,* and Jeong Young Park* "Enhanced Hot Electron Lifetime and Flux on a Perovskite Modified Plasmonic Nanodiode", *NANO KOREA 2022 Symposium*, Goyang, Korea (Poster presentation)
2. **Yujin Park**, Jungkweon Choi, Mincheol Kang, Hyunhwa Lee, Hyotcherl Ihee,* and Jeong Young Park* "Elongated Lifetime and Enhanced Flux of Photo-induced Hot Electrons on a Perovskite Modified Plasmonic Nanodiode", *2022 The 13th International Workshop on Oxide Surfaces: IWOX-XIII*, Pyeongchang, Korea (Poster presentation)
3. **Yujin Park**, Jungkweon Choi, Mincheol Kang, Hyunhwa Lee, Hyotcherl Ihee,* and Jeong Young Park* "Elongated Lifetime and Amplified Flux of Photo-induced Hot electrons on a Perovskite Modified Plasmonic Nanodiode", *2021 11th Asian Photochemistry Conference*, Online (Oral presentation)
4. **Yujin Park**, Jungkweon Choi, Changhwan Lee, An-Na Cho, Dae Won Cho, Nam-Gyu Park, Hyotcherl Ihee,* Jeong Young Park* "Amplified Hot Electron Flow on Perovskite Modified Plasmonic Au-TiO₂ Nanodiode", *2019 ACS Fall National Meeting & Exposition CHEMISTRY & WATER*, San Diego, USA (Poster presentation)
5. **Yujin Park**, Jungkweon Choi, Hyotcherl Ihee,* and Jeong Young Park* "Elongated lifetime and enhanced flux of hot electron on perovskite modified plasmonic nanodiode", *2019 5th International Conference on Ultrafast Structural Dynamics*, Daejeon, Korea (Poster presentation)

(Domestic conferences)

6. **Yujin Park**, and Jeong Young Park* "Manipulating Hot electron Lifetime and Flux by Controlling Perovskite Bandgap on a Perovskite Plasmonic Nanodiode", *2022 130th General Meeting of the Korean Chemistry Society*, Gyeongju, Korea (Poster presentation)
7. **Yujin Park**, Jungkweon Choi, Hyotcherl Ihee,* and Jeong Young Park* "Prolonged Lifetime and Enhanced Flow of Hot electrons on a Perovskite Combined Plasmonic Nanodiode" *2021 128th General Meeting of the Korean Chemistry Society*, Busan, Korea (Poster presentation)
8. **Yujin Park**, Seongeun Cho, and Byoungnam Park* "Electrical and Optical Properties of Vapor-Deposited Perovskite Films", *2015 Fall Conference of the Korean Institute of Metals and Materials*, Daejeon, Korea (Poster presentation)

HONORS & AWARDS

- **POSCO TJ Park Science Fellowship** 2021~2023
2021 Cheong-Am Science Fellowship from POSCO TJ Park Foundation

- **Best BKCS Poster Award** Oct. 2022
2022 130th General Meeting of the Korean Chemical Society
- **Best Undergraduate Dissertation Award** Jan. 2017
Department of Materials Science and Engineering, Hongik University
- **Research Assistant Scholarships** 2015~2017
Department of Materials Science and Engineering, Hongik University

SKILLS

- **Characterization** 2021~2024
: Atomic Force Microscopy (AFM), Time-resolved pump-probe spectroscopy, Synchrotron Infrared (IR) spectroscopy, Monochromated STEM-EELS
- **Computational Skills**
: Finite-Difference Time-Domain (FDTD) Simulation (Photonics, Lumerical)

OUTREACH ACTIVITY

- Welch Summer Scholar Program June 2024
Mentoring Texas high school students in a five-week in-lab chemical science research program

COLLABORATORS

- Prof. Hyotcherl Ihee, Chemistry, KAIST
- Prof. Moonsang Lee, MSE, Inha University
- Prof. Byungha Shin, MSE, KAIST
- Prof. Kyoungsik Yu, EE, KAIST
- Prof. Thomas M. Truskett, ChE, UT Austin