

Sukhyeon Ka

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[Biphotonics Engineering Lab](#)

RESEARCH INTERESTS

Optical simulation, Optical super-resolution microscopy, Surface plasmon, Meta structure

EDUCATION

Yonsei University, Seoul, Korea March 2022 - Present
Ph.D. Candidate in School of Electrical and Electronic Engineering
(*Thesis Advisor: Prof. Donghyun Kim*)

Yonsei University, Seoul, Korea March 2015 - February 2022
B.S. in Dept. of Physics
Early admission

HONORS & SCHOLARSHIPS

Scholarships

- **Samsung Display Industry-Academy Scholarship** (2025 - Present)
- **Yonsei Honors Scholarship** (2015 - 2024)
(admission with highest distinction and Merit-based)
- **National Science and Technology Scholarship** (Spring 2015, 2016)
- Academy Research Fellowship

Academic Awards

- Yonsei Univ. 2019, 2020 Academic Achievement Award (Fall 2019, 2020)

EXPERIENCE

SPIE Student Chapter Yonsei University, March 2026 - Present
President

Optica Student Chapter Yonsei University, March 2026 - Present
President

PUBLICATIONS

1. Hajun Yoo, Kwanhwi Ko, **Sukhyeon Ka**, Gwiyeong Moon, Hyunwoong Lee, Seongmin Im, Peng Xi, and Donghyun Kim, "Near-isotropic Super-Resolution Microscopy with Axial Interference Speckle Illumination," *Nature Communications* (IF : 15.7), 16, Article number: 9274, October 20, 2025.
2. Kyungnam Kang, Hajun Yoo, Hyunwoong Lee, **Sukhyeon Ka**, Jaeyun Kim, Myungchan An, Young Gu Kim, DuckJong Suh, Sunghan Kim, Jungho Kim, and Donghyun Kim, "Metasurface-integrated organic light-emitting diodes: analysis of spectral effects on theoretical and experimental performance," *Laser & Photonics Reviews* (IF : 10.0), 19(10) , 2402132, February 19 (web), May 22 (print), 2025.
3. Hyunwoong Lee, Seongmin Im, Kyungnam Kang, **Sukhyeon Ka**, and Donghyun Kim, "Curved Plasmonic Devices for Flexibility: Modeling, Fabrication, and Characterization," *IEEE Journal of Selected Topics in Quantum Electronics* (IF : 4.3), 30(3), Article Sequence Number: 4600108, December 20, 2023 (Date of publication), May 1, 2024 (Issue publication)

4. Jongha Lee, Gwiyeong Moon, **Sukhyeon Ka**, Kar-Ann Toh, and Donghyun Kim, "Deep Learning Approach for the Localization and Analysis of Surface Plasmon Scattering," *Sensors* (IF : 3.4), 23(19), 8100, September 27, 2023. (invited paper)
5. Hajun Yoo, Hyunwoong Lee, Seongmin Im, **Sukhyeon Ka**, Gwiyeong Moon, Kyungnam Kang, and Donghyun Kim, "Switching on Versatility: Recent Advances in Switchable Plasmonic Nanostructures," *Small Science* (IF : 11.1), 3(10), 2300048, September 10, 2023. (invited Review)
6. **Sukhyeon Ka**, Hajun Yoo, and Donghyun Kim, "Random Structured Plasmonic Near-Field Illumination for Enhanced Surface Imaging," *2025 International Conference on Electronics, Information, and Communication (ICEIC)*, February 18, 2025. (Conference proceedings)
7. Hajun Yoo, Kwanhwi Ko, **Sukhyeon Ka**, Gwiyeong Moon, Hyunwoong Lee, Seongmin Im, Peng Xi, and Donghyun Kim, "Three-dimensional near-isotropic super-resolution imaging via axial interference speckle illumination," *Proceedings of SPIE*, Volume 12858, Volume 13867, Nanoscale Imaging, Sensing, and Actuation for Biomedical Applications XXIII, 1386702, March 5, 2026. (Conference proceedings)
8. Hajun Yoo, Kwanhwi Ko, **Sukhyeon Ka**, Hyunwoong Lee, Seongmin Im, and Donghyun Kim, "Nanoscale fluctuation-enhanced axial localization microscopy integrated with metallic structure-assisted fluidic chips," *Proceedings of SPIE*, Volume 12858, Nanoscale Imaging, Sensing, and Actuation for Biomedical Applications XXI, 1285807, March 13, 2024. (Conference proceedings)

PATENTS

1. Kwan Hwi Ko, Hajun Yoo, Inseop Byeon, **Sukhyeon Ka**, Donghyun Kim, "Optical Device using Dielectrophoresis," Korea #10-2025-0062308 (filed 2025.05.14)
2. Hajun Yoo, Hongki Lee, Gwang Myeong Seo, Inseop Byeon, **Sukhyeon Ka**, Kwan Hwi Ko, Sungmin Im, Gwiyeong Moon, Hyunwoong Lee, Jong Hwan Sung, Donghyun Kim, "Optofluidic Biochip for Controlling Fluid based on Optics and Methods of Manufacturing and Fluid Control Thereof," Korea #10-2022-0089660 (filed 2022.07.20). International Application #PCT/KR2022/010934, International Filing Date: 26.07.2022).

CONFERENCE PRESENTATIONS (presenter*)

1. [Oral Presentation] **Sukhyeon Ka***, Hajun Yoo, and Donghyun Kim, "Plasmonic Near-Field Randomization for Improved Surface Imaging," in Image Reconstruction & Analysis MO-AF1-PAR-D, Focus on Microscopy 2025 (April 13-16, 2025 in Taipei-Taiwan), April 14, 2025.
2. **Sukhyeon Ka***, Hajun Yoo, Minghao Wang, Kwanhwi Ko, Sara Ait Abderahmane, and Donghyun Kim, "High Resolution Live Cell Surface Imaging via Random Illumination Based Nanospeckle Microscopy," 0141, SPIE Advanced Biophotonics Conference 2025 (SPIE ABC 2025, October 29 - November 1, 2025), Sono Bell Jeju, Korea, October 31.
3. **Sukhyeon Ka***, Hajun Yoo, MingHao Wang, KwanHwi Ko, and Donghyun Kim, "Nanospeckle Illumination Microscopy with Randomized Light Pattern," MP-V-Photonics, Optics and Photonics Congress(OPC 2025), July 6-9, ICC, Jeju, 2025.
4. **Sukhyeon Ka***, Hajun Yoo, Hyunwoong Lee, and Donghyun Kim, "Fabrication of Lattice Nanoislands for Improved Transmission in the Near-Infrared," Paper Number: 14-1341, Session Code: P3, Presentation Code: P3-151, CLEO Pacific Rim 2024, August 4-9, Songdo Convensia, Incheon, August 8, 2024.

5. Hongki Lee, Songmin Im, **Sukhyeon Ka***, Jooyoung Kim, Jaekwon Lee, Kar-Ann Toh, and Donghyun Kim, "*Measurement of Leakage Radiation from Random Nanoislands for Machine Learning-Based Prediction*," Paper Number: 08-1401, Session Code: P2, Presentation Code: P2-055, CLEO Pacific Rim 2024, August 4-9, Songdo Convensia, Incheon, August 7, 2024.
6. **Sukhyeon Ka***, Hajun Yoo, and Donghyun Kim, "*Random Plasmonic Near-field Illumination for Super-resolved Surface Imaging*," MP-VI.04, Optics and Photonics Congress 2024, July 7-10, ICC, Jeju, July 8, 2024.
7. **Sukhyeon Ka***, Hajun Yoo, Hyunwoong Lee, and Donghyun Kim, "*Advanced Biosensing Platform with Lattice Nanoislands in the NIR Window*," Paper No.: P00065, Topic: 04. Nanobiophotonics, SPIE ABC 2023, November 1 – 4, 2023, Hamdeok Sonobelle, Jeju, November 4, 2023.
8. **Sukhyeon Ka***, Hajun Yoo, Hyunwoong Lee, and Donghyun Kim, "*Direct writing based disordered lattice nanoislands for biosensing platform with NIR enhanced transmittance*," TP-VI-03, Optics and Photonics Congress 2023, 27-30 August, 2023, ICC, Jeju, August 29, 2023.

TEACHING EXPERIENCES

Teacher's Certificate

- **Secondary School Teacher** (Grade II, Physics)

Graduate Students Teaching Assistant (TA)

- Advanced Biomedical Optics (EE, graduate) (Spring 2026)
- Biomedical Engineering Experiments (EE, Undergraduate) (Fall 2025)
- Physical electronics (EE, Undergraduate) (Spring 2025)
- Electromagnetic Wave Theory I (EE, Undergraduate) (Fall 2023)
- Electronics Laboratory I (EE, Undergraduate) (Fall 2022)

SKILLS & NEWS

Skills

- FEM, FDTD, RCWA Electromagnetic wave simulation (Lumerical, Rsoft (fullwave, diffractmod), MATLAB, COMSOL)
- E-beam lithography, E-beam&Thermal evaporation, Atomic Layer Deposition
- Nanoscale measurements (AFM)
- Optical system installation (Optical imaging setup, LabView)
- Image and raw data processing (MATLAB, C, ImageJ, Python)
- Military service in South Korea (2017.08.14 - 2019.07.21)

News

- BPEL co-organized the 2025 China-Korea Bilateral Forum on Advanced Optical Microscopy and Sensing, Peking University on September 12/13, 2025.
Sukhyeon Ka: High Resolution Live Cell Surface Imaging via Random Illumination Based Nanospeckle Microscopy
- Nishizaka Lab for collaboration from January 19 to February 3, 2025.