

# SEUNGMAN CHOI

Technical Researcher in Mechanical Engineering Research Institute

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## RESEARCH INTERESTS & SKILLS

### AREA OF INTERESTS

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**Nonlinear optics and spectroscopy, optoelectronics for ultra-precision engineering and metrology using femtosecond pulse laser.**

Detailed ongoing research topics include:

- Interpretation of light-matter interaction, e.g. high harmonic generation and surface plasmon polariton.
- development of robust EUV light source with high photon flux.
- High-precision & ultrafast metrology via time-resolved EUV spectroscopy and coherent diffraction imaging.

### RESEARCH SKILLS

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- **Experimental Technique:** Photo/soft lithography, focused-ion beam (FIB), scanning electron microscopy (SEM), atomic force microscopy (AFM), ultra-high vacuum system, 3D printer, etc.
- **Programming/software skills:** Python, LabVIEW, ANSYS Lumerical, ANSYS Mechanical, COMSOL Multiphysics, Solidworks, etc.

## PUBLICATIONS

### JOURNALS & PATENT

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- [1] **(In Preparation) “Opticsless Control of Extreme Ultraviolet Beam based on High Harmonic Generation from Solids.”**  
B. Kim\*, S. Choi\*, Y. W. Kim, Y.-J. Kim and S.-W. Kim,  
\*equally contributed to this work.
- [2] **(In Preparation) “Soft Step Emulsification for Actively-tunable Droplet.”**  
S. Choi, N. Tottori, T. Nisisako
- [3] **“Compensation of Laser Propagation Effects within Solids for High Harmonic Generation of Extreme Ultraviolet Radiation.”**  
Y.W. Kim\*, B. Kim\*, S. Choi\*, H. K. Nam, H. Kim, Y.-J. Kim and S.-W. Kim,  
\*equally contributed to this work.  
*Optics & Laser Technology*, 2022, [145: 107507](#).
- [4] **“Development of Bipolar Electrostatic Chuck Module Having Array of Beam Assembly Using Lithography Technique”**  
S. Choi, K. Wakabayashi, S. Saito  
*Journal of Micromechanics and Microengineering*, 2018, [28.12: 125011](#).
- [5] **“Micro Step-emulsification Device”**  
T. Nisisako, S. Choi and N. Tottori  
Application num.: 2018-036016, Patent num.: [2019-150748](#), JP.

## INTERNATIONAL PROCEEDINGS

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- [1] **“High Harmonic Generation from Bulk Crystals using Tailored Driving Femtosecond Laser Pulse”**  
S. Choi, Y.W. Kim, B. Kim, H.K. Nam, Y.-J. Kim and S.-W. Kim  
*2020 International Symposium on Precision Engineering and Sustainable Manufacturing (PRESM 2020)*, Online Symposium, Nov. 15-18, 2020.
- [2] **“Mechanically and Directionally Tunable Soft Step Emulsification”**  
S. Choi, N. Tottori and T. Nisisako  
*The 22<sup>nd</sup> International Conference on Miniaturized Systems for Chemistry and Life Sciences (MicroTAS2018)*, Kaohsiung, TW, Nov. 11-15, 2018.
- [3] **“Development of Bipolar Electrostatic Chuck Module Having Array of Beam Assembly Using Lithography Technique”**  
S. Choi, K. Wakabayashi and S. Saito  
*2017 Materials Research Society Fall meeting (MRS 2017)*, Boston, MA, USA, Nov. 26-Dec 1, 2017.
- [4] **“A Soft and Disposable Step-emulsification Device for Generating Monodisperse Emulsions and Particles”**  
S. Choi, N. Tottori, R. Zhang and T. Nisisako  
*The 7th International Conference of Asian Society for Precision Engineering and Nanotechnology (ASPEN 2017)*, Seoul, Korea, Nov. 14-17, 2017.

## GRANTS & AWARDS

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- [1] **Excellence Award** Feb 2019  
*Korean Scientists and Engineers Association in Japan (KSEAJ)*, JP.
- [2] **ITO Educational Foundation Scholarship** (JPY 180,000 per month) Apr 2017 – Mar 2019  
*ITO Foundation for International Education Exchange*, JP.
- [3] **Foreign Tour Business Grant** (JPY 197,000 once) Aug 2018  
*The Precise Measurement Technology Promotion Foundation (PMTP-F)*, JP.
- [4] **MutoEiji Award** Mar 2017  
**Academic Excellence Award in mechanical engineering department**  
*The Japan Society for Design Engineering (JSDE)*, JP.
- [5] **Korea-Japan Join Government Scholarship** (JPY 130,000 per month) Apr 2013 – Mar 2017  
*Korea and Japan Government*, KR&JP.

## EDUCATIONAL BACKGROUND

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- **M.S. in Mechanical Engineering** Apr 2017 – Mar 2019  
 Tokyo Institute of Technology, Tokyo, Japan  
 Thesis: Elastically deformable soft step emulsification for actively-tunable droplet.  
 Advisor: Prof. Takasi Nisisako
- **B.S. in Mechanical and Intelligent Systems Engineering** Apr 2013 – Mar 2017  
 Tokyo Institute of Technology, Tokyo, Japan (GPA 3.69/4.00)  
**magna Cum Laude in 4 years (Top 10%)**  
 Thesis: Development of bipolar electrostatic chuck module having array of beam assembly using lithography technique.  
 Advisor: Prof. Shigeki Saito
- **Preparatory Education (Korea-Japan Joint Government Scholarship Program)** Apr 2012 – Mar 2013  
 Kyunghee University and Tokyo Institute of Technology  
 Study about Japanese, basic physics and mathematics for 6 months at each institute.