

Young Woo Choi

Assistant Professor

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Education

Ph.D. in Physics

Mar 2016 – Feb 2021

Department of Physics, Yonsei University, Seoul, Korea
(Advisor: Prof. Hyoung Joon Choi)

B.S. in Physics

Mar 2010 – Feb 2016

Department of Physics, Yonsei University, Seoul, Korea
(Mandatory military service from Oct 2012 to Jul 2014)

Experience

Assistant Professor

Sep 2024 – present

Department of Physics, Sogang University, Seoul, Korea

Postdoctoral Researcher

Jun 2021 – Aug 2024

Department of Physics, University of California, Berkeley, CA, USA
(Advisor: Prof. Marvin L. Cohen)

Postdoctoral Researcher

Mar 2021 – May 2021

Department of Physics, Yonsei University, Seoul, Korea
(Advisor: Prof. Hyoung Joon Choi)

Research Interests

- **Emergent phenomena in correlated and low-dimensional quantum materials**
 - Superconductivity, charge-density waves, quasiparticles and collective excitations
- **Design of novel quantum materials and nanostructures**
 - Moire superlattices, 1D single chains, molecular nanomachines, and 2D heterostructures
- **Development of first-principles electronic-structure methods**
 - Density functional theory, many-body perturbation theory, machine-learning-based compression

Research Highlights

- 17 peer-reviewed publications, including 3 in Physical Review Letters, 6 in ACS Nano, and 1 in Advanced Materials.
- Google Scholar metrics: 477 citations; h-index 9. (Jun 2026)

Full Publications

[17] Byunghyun Kim[†], Ayoung Yuk[†], Yunyeong Chang[†], Dongsin Kim[†], Daesung Park, **Young Woo Choi***, Miyoung Kim*, Moon Sung Kang*, and Hyobin Yoo*, Dislocation Networks in Marginally Twisted Bilayer MoS₂, [ACS Materials Letters](#) **8**, 1382 (2026).

[16] Byeongin Lee, Junho Bang, Sayan Banerjee, João Augusto Sobral, **Young Woo Choi**, Claudia Felser, Mathias S. Scheurer, Jian-Feng Ge, and Doohee Cho,

- Anomalous impurity-induced charge modulations in black phosphorus,
[Physical Review B 113, L041105 \(2026\)](#).
- [15] Yongjae Cho, Sushanta Pal, Stephen J. Buffat, Hao-Yu Lan, **Young Woo Choi**, Dmitry Y. Zemlyanov, Connor Devitt, Sunil A. Bhave, Zhihong Chen, and Joerg Appenzeller,
Extension p-Doping of Carbon Nanotube Transistors through Nitric Oxides Annealing,
[ACS Nano 19, 39014 \(2025\)](#).
- [14] **Young Woo Choi**[†], Yangjin Lee[†], Kwanpyo Kim, Alex Zettl, and Marvin L. Cohen,
Atomic and Electronic Structures of 1D Phosphorus Nanoring and Nanohelix,
[ACS Nano 19, 12155 \(2025\)](#). († Equal contributions)
- [13] **Young Woo Choi**, Jisoon Ihm, and Marvin L. Cohen,
Pairing interaction from three-dimensional acoustic plasmon demon modes in Sr₂RuO₄,
[Physical Review B 110, 155127 \(2024\)](#).
- [12] Yangjin Lee[†], **Young Woo Choi**[†], Linxuan Li, Wu Zhou, Marvin L. Cohen, Kwanpyo Kim, and Alex Zettl,
SiX₂ (X=S, Se) Single Chains and (Si-Ge)₂ Quaternary Alloys,
[ACS Nano 18, 17882 \(2024\)](#). († Equal contributions)
- [11] Jeehong Park[†], Soonsang Huh[†], **Young Woo Choi**[†], Donghee Kang, Minsoo Kim, Donghan Kim, Soohyung Park, Hyoung Joon Choi, Changyoung Kim, and Yeonjin Yi,
Visualizing the low-energy electronic structure of prototypical hybrid halide perovskite through clear band measurements,
[ACS Nano 18, 7570 \(2024\)](#). († Equal contributions)
- [10] Yangjin Lee[†], **Young Woo Choi**[†], Kihyun Lee, Chengyu Song, Peter Ercius, Marvin L. Cohen, Kwanpyo Kim, and Alex Zettl,
One-dimensional Magnetic MX₃ Single-Chains (M=Cr, V and X=Cl, Br, I),
[Advanced Materials 35, 2307942 \(2023\)](#). († Equal contributions)
- [9] Soo Yeon Lim[†], Han-gyu Kim[†], **Young Woo Choi**[†], Takashi Taniguchi, Kenji Watanabe, Hyoung Joon Choi, and Hyeonsik Cheong,
Modulation of phonons and excitons due to moiré potentials in twisted-bilayer of WSe₂/MoSe₂,
[ACS Nano 17, 13938 \(2023\)](#). († Equal contributions)
- [8] Yangjin Lee[†], **Young Woo Choi**[†], Kihyun Lee, Chengyu Song, Peter Ercius, Marvin L. Cohen, Kwanpyo Kim, and Alex Zettl,
Tuning the Sharing Modes and Composition in a Tetrahedral GeX₂ (X = S, Se) System via One-Dimensional Confinement,
[ACS Nano 17, 8734 \(2023\)](#). († Equal contributions)
- [7] Jangwon Kim[†], Youjin Lee[†], **Young Woo Choi**[†], Taek Sun Jung, Suhan Son, Jonghyeon Kim, Hyoung Joon Choi, Je-Geun Park, and Jae Hoon Kim,
Terahertz spectroscopy and DFT analysis of phonon dynamics of the layered van der Waals semiconductor Nb₃X₈ (X = Cl, I),
[ACS Omega 8, 14190 \(2023\)](#). († Equal contributions)
- [6] **Young Woo Choi** and Marvin L. Cohen,
Resonantly Enhanced Electromigration Forces for Adsorbates on Graphene,
[Physical Review Letters 129, 206801 \(2022\)](#).
- [5] **Young Woo Choi** and Hyoung Joon Choi,
Dichotomy of Electron-Phonon Coupling in Graphene Moiré Flat Bands,
[Physical Review Letters 127, 167001 \(2021\)](#).
- [4] **Young Woo Choi** and Hyoung Joon Choi,
Anisotropic Pseudospin Tunneling in Two-Dimensional Black Phosphorus Junctions,
[2D Materials 8, 035024 \(2021\)](#).

- [3] **Young Woo Choi** and Hyoung Joon Choi,
Intrinsic band gap and electrically tunable flat bands in twisted double bilayer graphene,
[Physical Review B **100**, 201402\(R\) \(2019\)](#).
- [2] **Young Woo Choi** and Hyoung Joon Choi,
Role of Electric Fields on Enhanced Electron Correlation in Surface-Doped FeSe,
[Physical Review Letters **122**, 046401 \(2019\)](#).
- [1] **Young Woo Choi** and Hyoung Joon Choi,
Strong electron-phonon coupling, electron-hole asymmetry, and nonadiabaticity in magic-angle twisted bilayer graphene,
[Physical Review B **98**, 241412\(R\) \(2018\)](#).

Research Grants

- Sogang G-LAMP Research Grant, Sogang University, 2024–present (overall program: KRW 5B/year, approx. USD 3.3M/year, for six years; Choi allocation: ~KRW 160M/year, approx. USD 106k/year)
- Post-doctoral Training Grants, National Research Foundation of Korea, 2023 (KRW 45M/year; approx. USD 30k/year)
- Global Ph.D. Fellowship, National Research Foundation of Korea, 2017–2021 (KRW 30M/year; approx. USD 20k/year)

Teaching Experience

Machine Learning Applications in Physics	Spring 2026, Spring 2025
Computational Physics	Fall 2025
General Physics I	Spring 2026, Spring 2025
General Physics II	Fall 2025
Statistical Physics	Fall 2024