min-cheol.lee@intel.com | http://mincheollee.com | Linkedin | Google Scholar

Min-Cheol Lee

SOFTWARE RESEARCH ENGINEER/SCIENTIST AT INTEL CORPORATION

Ph.D. in Physics, Software engineer specializing in the research and development of the resolution enhancement technologies (RET) for the nanoscale photo-lithographic process.

Optical spectroscopy scientist and material scientist with expertise in ultrafast spectroscopy of optical and X-ray lights, and multifunctional quantum materials, including strongly correlated electron systems and topological materials.

EDUCATION

2019	PH.D IN PHYSICS	Seoul National University	Seoul, South Korea
2013	B.S IN PHYSICS	Seoul National University	Seoul, South Korea

STATUS

2023	GREEN CARD HOLDER

WORK EXPERIENCE

2022 – present

SOFTWARE RESEARCH ENGINEER/SCIENTIST | Intel Corporation, OR, USA
+ Developing and implementing models and software to perform layout correction for high resolution reproduction on wafers.
+ Applying software engineering methods, theories and research as well as data analysis in the investigation and solution of technical RET problems.

2019 – 2022

POSTDOCTORAL RESEARCHER | Los Alamos National Laboratory, NM, USA
+ Constructed experiments of ultrafast spectroscopy using femtosecond infrared (IR), terahertz (THz) from home-lab systems, as well as femtosecond X-ray pulses from X-ray free-electron laser (XFEL) facilities at SLAC-LCLS, PAL-XFEL, and SPring8-SACLA
+ Investigated non-equilibrium dynamics of optical properties and crystal structures in superconducting and topological materials

2013 – 2019

GRADUATE RESEARCH ASSISTANT | Seoul National University, South Korea
+ Constructed home lab near-infrared/terahertz pump-probe spectroscopic system
+ Constructed experiments of X-ray absorption and photoemission spectroscopy at synchrotron facilities – PAL (South Korea), NSRRC (Taiwan)
+ Investigated crystal and electronic structures coupled to magnetism in Mott insulators and superconductors (ruthenate, rhodate, iridate and pnictide)
+ Thesis title: *"Non-equilibrium Spectroscopic Studies on Coherent Phonon Oscillations in Transition Metal Compounds"*

SKILLS

PROGRAMMING

Python - building models and problem solving for photolithography, developing data pipeline, statistical data analysis and plotting | MATLAB, Origin, Igor, LabVIEW, VESTA – experimental data analysis and plotting, device control and experiment design, optical/physical simulations, crystal structure visualization and simulation

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SKILLS

SPECTROSCOPY

Ultrafast spectroscopy – pump-probe techniques with infrared (IR), terahertz (THz) and X-ray pulses | THz generation/detection by optical rectification/electro-optic sampling | X-ray absorption spectroscopy (XAS), magnetic circular/linear dichroism, X-ray diffraction (XRD), time-resolved XRD | Ultrafast optical/IR laser – optical layout design, non-linear optics | XFEL @SPring-8-SACLA (Japan), PAL-XFEL (South Korea), and SLAC-LCLS (USA)

PUBLICATIONS & PRESENTATIONS

PUBLICATIONS

26 academic publications | 8 as First Author | google scholar
(1 Nature Materials, 4 Physical Review Letter, 1 Advance Materials, 1 Communications Physics, and 9 Physical Review B)

SELECTED PUBLICATIONS

Physical Review Letters
128, 155301 (2022).

"Direct Observation of Coherent Longitudinal and Shear Acoustic Phonons in the Weyl Semimetal TaAs Using Ultrafast X-ray Diffraction", Min-Cheol Lee and R. Prasankumar *et al*.

Nature Materials
21, 62-66 (2022).

"Photocurrent-driven transient symmetry breaking in the Weyl semimetal TaAs"
N. Sirica, P. P. Orth, M. S. Scheurer, Y. M. Dai, Min-Cheol Lee, R. P. Prasankumar *et al*.

Advanced Materials
30, 1704777 (2018).

"Spectroscopic studies on metal-insulator transition mechanism in correlated materials"
S. Y. Kim and Min-Cheol Lee* *et al*., (*co-1st author)

PROFESSIONAL ACTIVITIES

Journal Referee for
Physical Review Letters, Physical Review B, Communications Physics, and *Scientific Reports*

PRESENTATIONS

8 international conferences | 1 invited talk

HONORS & AWARDS

FELLOWSHIPS

BK (Brain Korea) scholarship	Seoul National University	2013, 2018-2019
Baek-Un Fellowship	Baek-Un Scholarship Foundation	2015
GSI Fellowship	Seoul National University	2014-2015
National Science and Engineering Undergraduate Scholarship		
	Korea Student Aid Foundation	2009-2013

AWARDS

Outstanding Ph.D. Thesis Award in 2019 | Seoul National University
1st prize awarded in *2018 IBS Art in Science* |"A piece of femto-galaxy" (link)

SERVICE

Military service in Korea Army | Technical Research Personnel | 2016-2019

REFERENCES

Dr. Dhananjay Bhawe

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Dr. Rohit Prasankumar

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