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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

NON-IMMIGRANT VISA | O-1A | **Intel Corporation**

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 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, 2 Physical Review Letter, 1 Advance Materials, 1 Communications Physics, and 9 Physical Review B)

SELECTED PUBLICATIONS

Physical Review Letters in press (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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