SangEun **Han**

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Education

KAIST (Korea Advanced Institute of Science and Technology) — *Daejoen, S.Korea*

Doctor of Philosophy in Physics, August 2020 — *March 2013 - August 2020*

Adviosr: Prof. Eun-Gook Moon
Thesis: *Renormalization group study on Strongly correlated system*

KAIST (Korea Advanced Institute of Science and Technology) — *Daejoen, S.Korea*

Bachelor of Science, Magna Cum Laude, Feburary, 2013 — *Feburary 2010 - Feburary 2013*

Double major in Physics and Mathematical Sciences

Hankuk University of Foreign Studies — *Seoul, S.Korea*

in Department of Physics — *March 2006 - January 2008*

Academic Affiliation

Department of Physics, University of Toronto — *November 2020 - Present*

Postdoctoral Fellow

School of Computational Sciences, KIAS — *August 2020 - October 2020*

Vising Scholar

Department of Physics, KAIST — *March 2013 - August 2020*

Candidate of Integrated Master's and Ph.D Program

Honors

Awards

2018	**Outstanding Poster Award**, Workshop on Spin-orbit Coupled Topological states	*October 2018*
2018	**Pre-doctoral Fellow of Physics at KAIST**, Department of Physics, KAIST	*August 2018*
2014	**Spring Outstanding Teaching Assistant Awards**, Department of Physics, KAIST	*September 2014*
2011	**Presidential Design Award**, Fall Semester's Freshmen Design Course Award, KAIST	*Feburary 2012*

Scholarships

2014 - 2015	**Scholarship**, Center for Theoretical Physics, Institute for Basic Science	*March 2014 - May 2015*
2006 - 2008	**Scholarship**, Hankuk University of Foreign Studies	*2006 Fall - 2008 Spring*

Services

Referee — *January 2020 - Present*

of Phys. Rev. Research.

Referee — *April 2019 - Present*

of Phys. Rev. Lett.

Referee — *September 2018 - Present*

of Phys. Rev. B

Sergent — *February 2008 - January 2010*

at Military service at Army in Republic of Korea

Publication list

"Non-Landau Fermi Liquid induced by Bose Metal"

SangEun Han and Yong Baek Kim

arXiv:2102.05052 [cond-mat.str-el]

"Lattice vibration as a knob for novel quantum criticality: Emergence of supersymmetry from spin-lattice coupling"

SangEun Han, Junhyun, and Eun-Gook Moon

Phys. Rev. B **103**, 014435. arXiv:1911.01435 [cond-mat.str-el]

"Emergent Anisotropic Non-Fermi Liquid at a Topological Phase Transition in Three Dimensions"

SangEun Han, Changhee Lee, Hongki Min, and Eun-Gook Moon

Phys. Rev. Lett. **122**, 187601. arXiv:1809.10691 [cond-mat.str-el]

"Quantum Criticality with Infinite Anisotropy in Topological Phase Transitions between Dirac and Weyl Semi-metals"

SangEun Han, Gil Young Cho, and Eun-Gook Moon

Phys. Rev. B **98**, 085149. arXiv:1804.01547 [cond-mat.str-el]

"Long-range Coulomb Interaction effects on Topological Phase Transitions between Semi-metals and Insulators"

SangEun Han and Eun-Gook Moon

Phys. Rev. B **97**, 241101(R). arXiv:1802.05727 [cond-mat.str-el]

"Topological Phase Transitions in Line-nodal Superconductors"

SangEun Han, Gil Young Cho, and Eun-Gook Moon

Phys. Rev. B **95**, 094502. arXiv:1601.00975 [cond-mat.str-el]

"Explaining the Lepton Non-universality at the LHCb and CMS from an Unified Framework"

Sanjoy Biswas, Debtosh Chowdhury, **SangEun Han**, and Seung J. Lee

JHEP **02**, 142 (2015). arXiv:1409.0882 [hep-ph]

Manuscripts under preparation

"Stability of O(N) criticality with Lattice Vibrations"

SangEun Han and Eun-Gook Moon

Presentation

Oral presentation

APS March Meeting 2020 (Virtual APS March Meeting) — *Denver, USA*
Quantum criticalities with lattice vibrations — *Mar. 3, 2020*

12th BK21+ Young Physicists Workshop — *Daejeon, S. Korea*
Emergence of Supersymmetry from spin-lattice coupling — *Feb. 4, 2019*

KAIST-Weizmann Workshop on Quantum Condensed Matter Physics — *Rehovot, Israel*
Emergence of Supersymmetry from spin-lattice coupling — *Dec. 5, 2019*

2019 KPS Fall Meeting — *Gwangju, S. Korea*
Quantum criticalities with lattice vibrations — *Oct. 25, 2019*

APS March Meeting 2019 — *Boston, USA*
Emergent Anisotropic Non-Fermi Liquid — *Mar. 4, 2019*

11th BK21+ Young Physicists Workshop — *Pohang, S. Korea*
Emergent Anisotropic Non-Fermi Liquid — *Feb. 15, 2019*

2018 KPS Spring Meeting — *Daejeon, S. Korea*
Emergent Anisotropic Non-Fermi Liquid — *Apr. 26, 2018*

APS March Meeting 2018 — *Los Angeles, USA*
Long-range Coulomb Interaction effects on Topological Phase Transitions between Semi-metals and Insulators — *Mar. 7, 2018*

2017 KPS Spring Meeting — *Daejeon, S. Korea*
Topological Phase Transitions in Dirac semi-metals of distorted spinels — *Apr. 21, 2017*

APS March Meeting 2017 — *New Orleans, USA*
Topological Phase Transitions in Dirac semi-metals of distorted spinels — *Mar. 14, 2017*

Poster presentation

2020 Theory Winter School — *Tallahassee, USA*
Emergence of supersymmetry from spin-lattice coupling — *Jan. 6-10, 2020*

IBSPCS-KIAS International Workshop Frustrated Magnetism — *Daejeon, S. Korea*
Stability of Quantum Criticalities — *Oct. 14-18, 2019*

The 2nd Workshop on Spin-orbit Coupled Topological States *Pohang, S. Korea*
Stability of Quantum Criticalities *Sep. 19-21, 2019*

KIAS workshop on Topology and Correlation in quantum materials *Busan, S. Korea*
Emergent Anisotropic Non-Fermi Liquid at a Topological Phase Transition in Three Dimensions *May 29-31, 2019*

The 19th JAPAN-KOREA-TAIWAN SYMPOSIUM ON STRONGLY CORRELATED ELECTRON SYSTEMS *Tokyo, Japan*
Long-range Coulomb Interaction effects on Topological Phase Transitions between Semi-metals and Insulators / Emergent Anisotropic Non-Fermi Liquid *Jan. 11-13, 2019*

The 1st Workshop on Spin-Orbit Coupled Topological States *Pohang, S. Korea*
Long-range Coulomb Interaction effects on Topological Phase Transitions between Semi-metals and Insulators / Emergent Anisotropic Non-Fermi Liquid *Oct. 1-5, 2018*
- *Outstanding Poster Award*

Advanced School and Workshop on Correlations in Electron Systems – from Quantum Criticality to Topology - *Trieste, Italy*
Long-range Coulomb Interaction effects on Topological Phase Transitions between Semi-metals and Insulators / Emergent Anisotropic Non-Fermi Liquid *Aug. 6-17, 2018*

International Workshop on "New Paradigms in Quantum Matter 2018" *Beijing, China*
Long-range Coulomb Interaction effects on Topological Phase Transitions between Semi-metals and Insulators / Emergent Anisotropic Non-Fermi Liquid *Jun. 24-Jul. 7, 2018*

KIAS workshop on Topology and Correlation *Seoul, S. Korea*
Long-range Coulomb Interaction effects on Topological Phase Transitions between Semi-metals and Insulators *Jun. 7-8, 2018*

10th BK21+ Young Physicists Workshop *Seoul, S. Korea*
Long-range Coulomb Interaction effects on Topological Phase Transitions between Semi-metals and Insulators *Feb. 8-9, 2018*

The 19th International Conference on Recent Progress in Many-Body Theories *Pohang, S. Korea*
Long-range Coulomb Interaction effects on Topological Phase Transitions between Semi-metals and Insulators *Jun. 25-30, 2017*

2016 Quantum Materials Symposium *Incheon, S. Korea*
Topological Phase Transitions in Line-nodal Superconductors *Feb. 22-26, 2016*

Teaching experiences

Teaching Assistants in *March 2013 - December 2017*

- PH504 Graduate Quantum Mechanics 2 — September 2017 - December 2017
- PH503 Graduate Quantum Mechanics 1 — March 2017 - June 2017
- PH496 Colloquium & PH990 Seminar — September 2016 - December 2016
- PH503 Graduate Quantum Mechanics 1 — March 2016 - June 2016
- PH302 Undergraduate Quantum Mechanics 2 — September 2015 - December 2015
- PH301 Undergraduate Quantum Mechanics 1 — March 2015 - June 2015
- PH654 Quantum Field Theory 2 — March 2014 - June 2014
- PH142 General Physics 2 — September 2013 - December 2013
- PH141 General Physics 1 — March 2013 - June 2013

References

Prof. Eun-Gook Moon

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291 Daehak-ro, Yuseong-gu, Daejeon 34141, Republic of Korea
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Prof. Hongki Min

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Prof. Gil Young Cho

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