

Junggi Yoon

Curriculum Vitae

Asian Pacific Center for Theoretical Physics (APCTP)
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Education

Ph.D. **Brown University**, Providence, RI, USA, May 2016.
Physics (Advisor : Prof. Antal Jevicki)

B.S. **Seoul National University**, Seoul, S. Korea, 2010, *summa cum laude*.
Physics and Mathematics (double major)

Research Experience

2021–Present **JRG Leader**, ASIA PACIFIC CENTER FOR THEORETICAL PHYSICS (APCTP), Pohang, Korea.

2018–2021 **Postdoctoral Fellow**, KOREA INSTITUTE FOR ADVANCED STUDY (KIAS), Seoul, Korea.

2016–2018 **Postdoctoral Fellow**, INTERNATIONAL CENTRE FOR THEORETICAL SCIENCES (ICTS-TIFR), Bengaluru, Karnataka, India.

2011–2016 **Research Assistant**, BROWN UNIVERSITY, Providence, RI, USA.
• Topic : Doctoral dissertation
• Advisor : Prof. Antal Jevicki

Teaching Experience

Spring 2014 **Teaching Assistantship**, Brown University, Providence, RI, USA.
PHYS 0040 - Basic Physics 2

Academic Awards and Honors

2022 – 2023 Adjunct Professor, POSTECH

2022 – 2023 Associate Member, KIAS

2022 – 2026 Mid-Career Researcher Program (Consolidator) Grant, National Research Foundation of Korea (NRF) grant funded by the Korea government (MSIT)

2023 – 2025 Brain Pool Program Grant, National Research Foundation of Korea (NRF) grant funded by the Korea government (MSIT)

2023 – 2024 International Mobility Program Grant, National Research Foundation of Korea (NRF) grant funded by the Korea government (MSIT)

- 2019 – 2021 Basic Research Program (Gibon Yeongu) Grant, National Research Foundation of Korea (NRF) grant funded by the Korea government (MSIT)
- 2020 Academic Research Award, Korea Institute for Advanced Study (KIAS)
- 2016 Anthony Houghton Award for Excellence in Theoretical Physics, USA
- 2015–2016 Galkin Fellowship, Galkin Foundation, USA
- 2010–2015 Doctoral Study Abroad Program Fellowship, Korea Foundation for Advanced Studies (KFAS)
- 2010–2011 Graduate School First Year Fellowship, Brown University, USA

Research Interests

- Strongly correlated system and AdS/CFT correspondence
- Black hole information loss problem
- Non-Hermitian Hamiltonian and non-unitary system
- Exact results in irrelevant deformations of QFTs
- Quantum gravity and higher spin gravity

Publications

- 2024 P. Narayan, Euihun Joung and J. Yoon, “Gravitational Edge Mode in Asymptotically AdS₂: JT Gravity Revisited,” *JHEP* **2405** (2024) 244 [arXiv:2304.06088 \[hep-th\]](#).
- K. Lee and J. Yoon, “ $T\bar{T}$ Deformation of $\mathcal{N} = (1, 1)$ Off-Shell Supersymmetry and Partially Broken Supersymmetry,” (2024) *accepted in Phys. Rev. D* [arXiv:2306.08030 \[hep-th\]](#).
- A. Jevicki, D. Mukherjee and J. Yoon, “Emergent factorization of Hilbert space at large N and black hole,” (2024) [arXiv:2404.07862 \[hep-th\]](#).
- K. Lee, A. Sivakumar and J. Yoon, “Gravitational Edge Mode in $\mathcal{N} = 1$ Jackiw-Teitelboim Supergravity,” (2024) [arXiv:2403.17182 \[hep-th\]](#).
- 2023 P. Chen, M. Sasaki, D. Yeom and J. Yoon, “Tunneling between Multiple Histories as a Solution to the Information Loss Paradox,” *Entropy* **2023**, 25 (2023) 1663 [arXiv:2206.10251 \[gr-qc\]](#).
- S. Ryu and J. Yoon, “Unitarity of Symplectic Fermion in α -vacua with Negative Central Charge,” *Phys. Rev. Lett.* **130** (2023) 241602 [arXiv:2208.12169 \[hep-th\]](#).
- 2022 K. Alkalaev, E. Joung and J. Yoon, “Color decorations of Jackiw-Teitelboim gravity,” *JHEP* **2208** (2022) 286 [arXiv:2204.10214 \[hep-th\]](#).
- K. Alkalaev, E. Joung and J. Yoon, “Schwarzian for colored Jackiw-Teitelboim gravity,” *JHEP* **2209** (2022) 160 [arXiv:2204.09010 \[hep-th\]](#).

- B. Kang and J. Yoon, “Sign-Problem-Free Variant of Complex Sachdev-Ye-Kitaev Model,” *Phys. Rev.* **B105** (2022) 045117 [arXiv:2107.13572 \[hep-th\]](#).
- P. Chen, M. Sasaki, D. Yeom and J. Yoon, “Resolving information loss paradox with Euclidean path integral,” *Int. J. Mod. Phys.* **D1** (2022) 14 [arXiv:2205.08320 \[gr-qc\]](#).
- D. Bak, C. Kim, S. Yi and J. Yoon, “Python’s Lunches in Jackiw-Teitelboim gravity with matter,” *JHEP* **2204** (2022) 175 [arXiv:2112.04224 \[hep-th\]](#).
- A. Jevicki, X. Liu, J. Yoon and J. Zheng, “Dynamical Symmetry and the Thermofield State at Large N ,” *Universe* **2022**, 8(2) (2022) 114 [arXiv:2109.13381 \[hep-th\]](#).
- 2021 J. Yoon, “A Bound on Chaos from Stability,” *JHEP* **2111** (2021) 097 [arXiv:1905.08815 \[hep-th\]](#).
- P. Chen, M. Sasaki, D. Yeom and J. Yoon, “Solving information loss paradox via Euclidean path integral,” (2021) [arXiv:2111.01005 \[hep-th\]](#).
- K. Lee, P. Yi and J. Yoon, “ $T\bar{T}$ -deformed Fermionic Theories Revisited,” *JHEP* **2107** (2021) 217 [arXiv:2104.09529 \[hep-th\]](#).
- D. Bak, C. Kim, S. Yi and J. Yoon, “Unitarity of Entanglement and Islands in Two-Sided Janus Black Holes,” *JHEP* **2101** (2021) 155 [arXiv:2006.11717 \[hep-th\]](#).
- 2019 Y. Qi, S. Sin and J. Yoon, “Quantum Correction to Chaos in Schwarzian Theory,” *JHEP* **1911** (2019) 035 [arXiv:1906.00996 \[hep-th\]](#).
- P. Narayan, and J. Yoon, “Chaos in Three-dimensional Higher Spin Gravity,” *JHEP* **1907** (2019) 046 [arXiv:1903.08761 \[hep-th\]](#).
- V. Jahnke, K. Kim and J. Yoon, “On the Chaos Bound in Rotating Black Holes,” *JHEP* **1905** (2019) 037 [arXiv:1903.09086 \[hep-th\]](#).
- R.d.M Koch, A. Jevicki, K. Suzuki and J. Yoon, “AdS Maps and Diagrams of Bi-local Holography,” *JHEP* **1903** (2019) 133 [arXiv:1810.02332 \[hep-th\]](#).
- 2018 T. Nosaka, D. Rosa and J. Yoon, “The Thouless time for mass-deformed SYK,” *JHEP* **1809** (2018) 041 [arXiv:1804.09934 \[hep-th\]](#).
- 2017 P. Narayan and J. Yoon, “Supersymmetric SYK Model with Global Symmetry,” *JHEP* **1808** (2017) 159 [arXiv:1712.02647 \[hep-th\]](#).
- J. Yoon, “SYK Models and SYK-like Tensor Models with Global Symmetry,” *JHEP* **1710** (2017) 183 [arXiv:1707.01740 \[hep-th\]](#).
- J. Yoon, “Supersymmetric SYK Model: Bi-local Collective Superfield / Supermatrix Formulation,” *JHEP* **1710** (2017)172 [arXiv:1706.05914 \[hep-th\]](#).
- P. Narayan, J. Yoon, “SYK-like Tensor Models on the Lattice,” *JHEP* **1708** (2017) 083 [arXiv:1705.01554 \[hep-th\]](#).

- S. Chaudhuri and V. Giraldo-Rivera, A. Joseph, Loganayagam, and J. Yoon, “Abelian Tensor Models on the Lattice,” *Phys. Rev.* **D97** (2017) 086007 arXiv:1705.01930 [hep-th].
- 2016 A. Jevicki, K. Suzuki and J. Yoon, “Bi-Local Holography in the SYK Model,” *JHEP* **1607** (2016) 007 arXiv:1603.06246 [hep-th].
- A. Jevicki and J. Yoon, “ S_N Orbifolds and String Interactions,” *J. Phys.* **A49** (2016) 205401 arXiv:1511.07878 [hep-th].
- A. Jevicki and J. Yoon, “Bulk from Bi-locals in Thermo Field CFT,” *JHEP* **1602** (2016) 090 arXiv:1503.08484 [hep-th].
- 2015 R. d. M. Koch, A. Jevicki, J. P. Rodrigues and J. Yoon, “Canonical Formulation of $O(N)$ Vector/Higher Spin Correspondence,” *J. Phys.* **A48** (2015) 105403 arXiv:1408.4800 [hep-th] .
- R. d. M. Koch, A. Jevicki, J. P. Rodrigues and J. Yoon, “Holography as a Gauge Phenomenon in Higher Spin Duality,” *JHEP* **1501** (2015) 055 arXiv:1408.1255 [hep-th].
- 2014 A. Jevicki, K. Jin and J. Yoon, “ $1/N$ and loop corrections in higher spin AdS_4/CFT_3 duality,” *Phys. Rev.* **D89** (2014) 085039 arXiv:1401.3318 [hep-th].
- 2013 A. Jevicki and J. Yoon, “Field Theory of Primaries in W_N Minimal Models” *JHEP* **1311** (2013) 060 arXiv:1302.3851 [hep-th].

———— School and Workshop Organizer

- Aug 10 – 18, **Organizer, Holography 2024: Correlation and Entanglement in Quantum matter**, APCTP, Pohang, Korea.
- Aug 1 – 2, **Organizer, Amplitudes Methods for Gravity and Cosmology II**, KIAS, Seoul, Korea.
- July 29 – 31, **Organizer, QUC School on A.I. in High Energy Physics - Amplitudes**, 2024 KIAS, Seoul, Korea.
- July 16 – 18, **Organizer, Quantum Threads: Stitching Strings and Qubits**, Kyunghee University, Seoul, Korea.
- May 27 – 31, **Organizer, Entanglement, Large N and Black Hole 2024**, APCTP, 2024 Pohang, Korea.
- April 12 – 13, **Organizer, Amplitudes Methods for Gravity and Cosmology I**, 2024 Kyunghee University, Seoul, Korea.
- Jan 24 – Feb 2, 2024 **Organizer, APCTP Winter School on Fundamental Physics 2024**, APCTP, Pohang, Korea.
- Jan 9 – 16, 2024 **Organizer, 6th Mandelstam Theoretical Physics School and Workshop 2024**, Mandelstam Institute for Theoretical Physics , Johannesburg, South Africa.

- Oct 29 **Organizer, Integrability, Duality and related topics 2023**, *APCTP*,
– Nov 4, 2023 Pohang, Korea.
- Oct 27 – 28, **Organizer, Quantum Geometry and Duality**, *APCTP*, Pohang, Korea.
2023
- Aug 16 – 24, **Organizer, Holography 2023: quantum matter and spacetime**, *APCTP*,
2023 Pohang, Korea.
- Jul 9 – 14, **Organizer, Numerical Methods in Theoretical Physics 2023**, *APCTP*,
2023 Pohang, Korea.
- Jun 18 – 24, **Organizer, Gravity beyond Riemannian Paradigm**, *Club ES Jeju Resort*,
2023 Jeju, Korea.
- May 23 – 28, **Organizer, Frontiers in Theoretical Physics 2023**, *Shinhwa World*, Jeju,
2023 Korea.
- May 11 – 23, **Organizer, Entanglement, Large N and Black Hole**, *APCTP*, Pohang,
2023 Korea.
- May 9 – 11, **Organizer, Scattering Amplitudes and related topics**, *APCTP*, Pohang,
2023 Korea.
- Jan 9 – 18, **Local Organizer, Kavli Asian Winter School 2023**, *IBS*, Daejeon, Korea.
2023
- Nov 24 – 29, **Organizer, Frontiers in Theoretical Physics 2022**, *APCTP-POSTECH-*
2022 *KIAS*, Jeju, Korea.
- Oct 30 **Organizer, APCTP Focus Program on “Integrability, Duality and**
– Nov 5, 2022 **related topics”**, *APCTP*, Pohang, Korea.
- Oct 11 – 18, **Organizer, Higher Spin Gravity and its Applications**, *APCTP*, Pohang,
2022 Korea.
- Aug 22 – 26, **Organizer, Junior Research Talks**, *APCTP-Kyunghee University*, Yeosu,
2022 Korea.
- Aug 11 – 19, **Organizer, APCTP Focus Program on “Holography 2022: quantum**
2022 **matter and spacetime”**, *APCTP*, Pohang, Korea.
- May 15 – 21, **Organizer, APCTP Focus Program on “Numerical Methods in Theo-**
2022 **retical Physics”**, *APCTP*, Pohang, Korea.
- April 20 – 22, **Organizer, Pioneer symposium "Novel Perspectives in Black Hole**
2022 **Information Paradox" in 2022 KPS Spring Meeting**, *Online*, Korea.
- Jan 23 – 29, **Organizer, Advances in Theoretical Physics 2022**, *APCTP-Kyunghee*
2022 *University*, Jeju, Korea.
- Nov 7 – 13, **Organizer, Frontiers in Theoretical Physics 2021**, *APCTP-POSTECH-*
2021 *KIAS*, Jeju, Korea.
- Sep 26 **Organizer, APCTP Focus Program on Exact Results on Irrelevant**
– Oct 2, 2021 **Deformations of QFTs**, *APCTP*, Jeju, Korea.
- Jan 7 – 16, **Organizer, 25th APCTP Winter School**, *APCTP*, Pohang, Korea.
2021

- Nov 8 – 13, 2020 **Organizer, TTbar deformation and Integrability**, *APCTP*, Pohang, Korea.
- Sep 21 – 25, 2020 **Local Organizer, KIAS Autumn Symposium on String Theory**, *KIAS*, Seoul, Korea.
- Jan 30 – Feb 5, 2020 **Organizer, 24th APCTP Winter School**, *APCTP*, Pohang, Korea.
- Sep 23 – Oct 2, 2019 **Organizer, Higher Spin Gravity: Chaotic, Conformal and Algebraic Aspects**, *APCTP*, Pohang, Korea.
- Oct 23 2019 **Organizer, Pioneer symposium "Quantum Chaos: common ground for black holes, quantum many body systems and quantum information" in 2019 KPS Meeting**, *KDJ Center*, Gwangju, Korea.
- Oct 7 – 12, 2018 **Organizer, K-HEP Workshop (Korean High Energy Physics Workshop)**, *APCTP*, Pohang, Korea.

Presentations

- Apr 25, 2024 **Korean Physical Society Spring Meeting 2024**, *IBS*, Daejeon, Korea.
"Emergent Factorization of Hilbert Space at Large N and Black Hole"
- April 12, 2024 **Amplitudes Methods for Gravity and Cosmology I**, *Kyunghee University*, Seoul, Korea.
"Emergent Factorization of Hilbert Space at Large N and Black Hole"
- Dec 10, 2023 **Indian Strings Meeting 2024**, *Indian Institute of Technology, Bombay*, Mumbai, India.
"Gravitational edge mode for super-JT gravity"
- Nov 27, 2023 **Black holes: bridge between number theory and holographic quantum information**, *Newton Institute*, Cambridge, UK.
"Gravitational edge mode for super-JT gravity"
- Nov 25, 2023 **Research Summary 2023**, *UNIST*, Ulsan, Korea.
"The Hitchhiker's Guide to the Edge"
- Nov 22, 2023 **POSTECH colloquium**, *POSTECH*, Pohang, Korea.
"Black Hole and Quantum Information"
- Nov 10, 2023 **Quantum Geometry and Duality**, *GIST*, Gwangju, Korea.
"Gravitational edge mode in Super-JT gravity"
- Oct 4, 2023 **Quantum Information, Quantum Matter and Quantum Gravity**, *YITP*, Kyoto, Japan.
"Gravitational edge mode for asymptotic AdS₂"
- Oct 26, 2023 **Korean Physical Society Fall Meeting 2023**, *Convention Center*, Changwon, Korea.
"Edge mode in supersymmetric Jackiw-Teitelboim gravity"
- Sep 4, 2023 **Large-N Matrix Models and Emergent Geometry**, *ESI*, Vienna, Austria.
"Gravitational edge mode for AdS₂"

- Jul 26, 2023 **Integrability, Deformation and Chaos**, *OIST*, Okinawa, Japan.
“TTbar deformation of N=(1,1) Off-shell supersymmetry and partially broken supersymmetry”
- May 15, 2023 **Entanglement, Large N and Black Hole**, *APCTP*, Pohang, Korea.
“Gravitational edge mode for asymptotic AdS₂”
- Apr 28, 2023 **SNU-KAIST seminar**, *SNU*, Seoul, Korea.
“Gravitational edge mode in JT gravity for asymptotic AdS₂”
- Apr 19, 2023 **Korean Physical Society Spring Meeting 2023**, *IBS*, Daejeon, Korea.
“Gravitational edge mode in JT gravity for asymptotic AdS₂”
- Mar 30, 2023 **POSTECH online seminar**, *POSTECH*, Pohang, Korea.
“Lecture on SYK Model”
- Mar 9, 2023 **XIX<vPHHQP<XX**, *online*.
“Higher-derivative Fermionic Theories”
- Jan 31, 2023 **High1 Workshop on Particle**, *High1*, Jeongsun, Korea.
“Simple Quantum Mechanical Model with Higher Derivative”
- Nov 20, 2022 **Research Summary 2022**, *Jeju University*, Jeju, Korea.
“Field Redefinition in Path Integral”
- Nov 16, 2022 **East Asia Joint Workshop on Fields and Strings 2022**, *KIAS*, Seoul, Korea.
“Does negative central charge always imply non-unitarity?”
- Nov 10, 2022 **QCD and Gauge/Gravity Duality**, *APCTP*, Pohang, Korea.
“Negative Norm State and Non-unitarity in (deformation)”
- Oct 19, 2022 **Korean Physical Society Fall Meeting 2022**, *BEXCO*, Busan, Korea.
“Does negative central charge always imply non-unitarity?”
- Sep 2, 2022 **CQUEST online Seminar**, *online*, CQUEST, Korea.
“Does Negative central charge always imply non-unitarity?”
- Aug 30, 2022 **Nonperturbative and Numerical Approaches to Quantum Gravity, String Theory and Holography**, *ICTS*, Bangalore, India.
“Does Negative central charge always imply non-unitarity?”
- Aug 24, 2022 **The 15th Asia Pacific Physics Conference**, *online*, Korea.
“Colored Jackiw-Teitelboim Gravity”
- Aug 19, 2022 **APCTP Focus Program “Holography 2022: quantum matter and spacetime”**, *online*, APCTP, Korea.
“Does Negative central charge always imply non-unitarity?”
- Jul 29, 2022 **APCTP Focus Program “Strings, Branes and Gauge Theories”**, *online*, APCTP, Korea.
“ $T\bar{T}$ Deformation of SUSY Model”
- Jun 29, 2022 **KIAS Seminar**, *online*, KIAS, Korea.
“ $T\bar{T}$ Deformation and Negative Norm State”
- Jun 26, 2022 **Fields, Strings and Gravity**, *Hongdae*, KIAS, Korea.
“ $T\bar{T}$ Deformation and SUSY”

- Jun 7, 2022 **Higher Spin Gravity online-club**, *online*, Mons University, Belgium.
"Colored JT Gravity"
- May 26, 2022 **SAG/JRG Workshop – Recent Topics in String Theory**, *APCTP*, Korea.
" $T\bar{T}$ Deformation of SUSY"
- Apr 20, 2022 **2022 Korean Physical Society Spring Meeting**, *online*, Korea.
"Dynamical Symmetry and Thermofield State at Large N "
- Dec 14, 2021 **KIAS-YITP 2021 Workshop**, *YITP*, Kyoto, Japan.
"Colored JT Gravity"
- Dec 2, 2021 **New Frontiers in Quantum Field Theory and String Theory**, *KIAS*, Song-do, Korea.
"Colored JT Gravity"
- Nov 30, 2021 **Research Summary 2021: Fields and Gravity**, *IBS*, Daejeon, Korea.
"BF Gravity and its generalizations"
- Nov 8, 2021 **Frontiers in Theoretical Physics 2021**, *Jeju*, Korea.
"Collective Field Theory and SYK Model"
- Oct 21, 2021 **2021 Korean Physical Society Fall Meeting**, *online*, Korea.
"Color Decorations of Jackiw-Teitelboim Gravity"
- Oct 6, 2021 **5th APCTP Alumni Scientific Symposium**, *Jeju*, Korea.
"QFT at Finite Temperature"
- Sep 30, 2021 **APCTP Focus Program: Exact results on irrelevant deformations of QFTs**, *Jeju*, Korea.
" $T\bar{T}$ Deformed Fermionic Theories Revisited"
- Aug 26, 2021 **Strings and Fields 2021**, *Online*, Korea.
" $T\bar{T}$ Deformed Fermionic Theories Revisited"
- Aug 24, 2021 **Holography 2021: Quantum Matter, Information and Spacetime**, *Online*, Korea.
"Quantum Monte Carlo Simulation of Sachdev-Ye-Kitaev Model"
- Aug 6, 2021 **Seminar in Ewha Womans University**, *Online*, Korea.
"Quantum Extremal Surface, Island Conjecture and Replica wormhole"
- Aug 5, 2021 **2021 BK Seminar Series, Hanyang University**, *Online*, Korea.
"Quantum Monte Carlo Simulation of Sachdev-Ye-Kitaev Model"
- Jul 27, 2021 **Gauge/Gravity Duality 2021**, *CERN*, *Online*, Switzerland.
"SUSY $T\bar{T}$ Deformation and Negative Norm States"
- Jul 15, 2021 **Higher Structures in QFT and String Theory**, *Online*, Germany-Switzerland-UK.
" $T\bar{T}$ Deformed Fermionic Theories Revisited"
- June 16, 2021 **PASCOS 2021**, *online*, Korea.
" $T\bar{T}$ Deformed Fermionic Theories Revisited"
- May 4, 2021 **Seminar in Sejong University**, *online*, Korea.
" $T\bar{T}$ Deformed Fermionic Theories Revisited"
- Apr 23, 2021 **2021 Korean Physical Society Spring Meeting**, *online*, Korea.
"SUSY $T\bar{T}$ Deformation and Negative Norm States"

- Feb 24, 2021 **CTPU seminar**, *online*, IBS, Korea.
 “Unitarity of Entanglement and Islands in Two-sided Janus Black Holes”
- Dec 22, 2020 **APCTP Workshop on Theoretical Physics 2020**, *online*, APCTP, Korea.
 “Unitarity of Entanglement and Islands in Two-sided Janus Black Holes”
- Dec 7, 2020 **Seminar**, *online*, Ewha Womans University, Korea.
 “Island Conjecture, Quantum Extremal Surface and Replica Wormhole”
- Nov 28, 2020 **The 61st Workshop on Gravity and Cosmology**, *online*, APCTP, Korea.
 “Unitarity of Entanglement and Islands in Two-sided Janus Black Holes”
- Nov 19, 2020 **String theory, gravity and cosmology (SGC2020)**, *online*, SKKU, APCTP, Korea.
 “Unitarity of Entanglement and Islands in Two-sided Janus Black Holes”
- Nov 5, 2020 **2020 Korean Physical Society Fall Meeting**, *online*, Korea.
 “Quantum Simulation of SYK Models”
- Aug 27, 2020 **Quantum Matter and Quantum Information with Holography**, *online*, APCTP, Korea.
 “Entanglement Islands and Janus Black Holes”
- Aug 27, 2020 **2020 apres-LHC Physics Workshop**, *online*, APCTP, Korea.
 “Recent progress on black hole information loss problem II: Entanglement Island”
- Jul 13, 2020 **2020 Korean Physical Society Spring Meeting**, *online*, Korea.
 “Dynamics of the SYK Model coupled to External D.o.F”
- Jul 7 – 8, **Updates on Methods of Theoretical Physics**, *online*, APCTP, Korea.
 2020 Three Lectures on “Black hole Information Paradox and Recent Progress”
- Jan 16, 2020 **Mandelstam Theoretical Physics School and Workshop**, Durban, South Africa.
 “Higher Spin Black Hole and Chaos”
- Oct 24, 2019 **2019 Korean Physical Society Fall Meeting**, Gwangju, Korea.
 “Schwarzian Theory and Chaos”
- Oct 28, 2019 **East Asia Joint Workshop on Fields and Strings 2019**, NCTS, Hsinchu, Taiwan.
 “Schwarzian Theory and Chaos”
- Sep 23, 2019 **Schwarzian Theory, Chaos and Higher Spin**, APCTP, Pohang, Korea.
 “Schwarzian Theory, Chaos and Higher Spin”
- Aug 23, 2019 **Quantum Matter from the Entanglement and Holography**, APCTP, Pohang, Korea.
 “Schwarzian Theory and Chaos”
- Jul 23, 2019 **Strings, Branes and Gauge Theories 2019**, APCTP, Pohang, Korea.
 “Schwarzian Theory and Chaos”
- Jul 9, 2019 **String 2019**, Brussels, Belgium.
 “Chaos in Higher Spin Gravity”
- Jun 19, 2019 **Quantum Information and String Theory 2019**, YITP, Kyoto, Japan.
 “Chaos in 3D Higher Spin Gravity”

- Mar 22, 2019 **Higher spins and holography**, *ESI*, Vienna, Austria.
 “Chaos in 3D Higher Spin Gravity”
- Oct 25, 2018 **3 Lectures**, *Seoul National University*, Seoul, Korea.
 “Chaos in black hole and holography”
- Oct 25, 2018 **Research Summary 2019: Fields, Gravity and String Theory**, *APCTP*, Pohang, Japan.
 “Various Aspects of SYK-like Models”
- Oct 31, 2018 **Holographic Tensors**, *OISK*, Okinawa, Japan.
 “Thermofield Dynamics of SYK model”
- Oct 6, 2018 **High Energy Physics 103**, *Yonsei University*, Seoul, Korea.
 “AdS Maps and Diagrams of Bi-local Holography”
- Aug 8 – 16, 2018 **Holography and Geometry of Quantum Entanglement**, *Hanyang University*, Seoul, Korea.
 “SYK model and Tensor model”
- Jan 17–23, 2018 **The Second Mandelstam Theoretical Physics School and Workshop**, Durban, South Africa.
 “Supersymmetric Sachdev-Ye-Kitaev model with global symmetry”
- Oct 16, 2017 **Quantum Spacetime Seminar**, *TIFR*, Mumbai, India.
 “Sachdev-Ye-Kitaev model with global symmetry”
- Jul 31– Aug 2, 2017 **Bangalore Area Strings Meeting 2017**, *ICTS*, Bangalore, India.
 “SYK model with global and super symmetry”
- Jul 9–16, 2017 **New ideas on higher spin gravity and holography**, *Kyung Hee University*, Seoul, Korea.
 “Sachdev-Ye-Kitaev Model: Global and Super Symmetry”
- May 8–19, 2017 **Student Talks on Trending Topics in Theory 2017**, *CMI*, Chennai, India.
 “Fun with Drawing Melons: SYK-Like Tensor Models”
- Dec 15–21, 2016 **Indian Strings Meetings 2016**, *IISER*, Pune, India.
 “Sachdev-Ye-Kitaev Model as a Matrix-vector Model”
- Dec 15–19, 2014 **Joburg Workshop on Matrices, Holography and QCD**, *University of the Witwatersrand*, Johannesburg, S. Africa.
 “Canonical Mapping of O(N) Vector/Higher Spin Correspondence”
- Oct 3, 2014 **Humboldt/Brown Mini-Conference**, *Brown University*, RI, USA.
 “Reconstructing Higher Spin Duality”

Outreach Activity

- Mar 14, 2024 **Speaker, 2024 Pi Day**, *POSTECH*, Pohang, Korea.
 Public Talk, “Beyond black hole horizon”
- Dec 15, 2023 **Speaker, APCTP Science and Culture Arts Communication Workshop “Sobaeksan Observatory Workshop”**, *Sobaeksan Optical Astronomy Observatory*, Danyang, Korea.
 Public Talk, “Holography and Black Hole”

2023 **Compère, APCTP Outreach Program “APCTP 2022 Science Book Lecture Series”**, *APCTP*, Pohang, Korea.

2022 **Compère, APCTP Outreach Program “APCTP 2022 Science Book Lecture Series”**, *Poemun Library*, Pohang, Korea.