

Ali Mollabashi (Theoretical Physicist)

School of Quantum Physics and Matter, Institute for Research in Fundamental Sciences (IPM)
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Curriculum Vitae

Employment:

- 10/2023 - Assistant Professor,
Institute for Research in Fundamental Sciences (IPM), Tehran, Iran
- 11/2020 - 9/2023 Postdoctoral Fellow,
Yukawa Institute for Theoretical Physics, Kyoto, Japan,
- 8/2018 - 11/2020 Alexander von Humboldt Fellow,
Max-Planck-Institute for Physics, Munich, Germany
- 5/2015 - 4/2018 Postdoctoral Associate,
School of Physics, IPM, Tehran, Iran,

Education:

- 9/2010 - 4/2015 **Ph.D. in High Energy Physics**, IPM, Tehran, Iran,
- 9/2007 - 1/2010 **M.Sc. in Physics**, Sharif University of Technology, Tehran, Iran
- 9/2002 - 8/2007 **B.Sc. in Physics**, Shahid Beheshti University, Tehran, Iran

Awards:

- 2023 Martyr Shahriari Prize, Iran National Elites Foundation
- 2022 ICTP regular associate (2023-2028)
- 2019/2020/2023/2025 Invited as a young scientist to Lindau Nobel Laureates Meeting
- 2017 Alexander von Humboldt postdoc research fellowship (2018-2020)
- 2016/2018/2019 Simons Foundation's "It from Qubit" grant for long term workshops

Professional Services:

- 2026 National School on Quantum Information Science, IPM
- 2024 Workshop on Dynamics and Scrambling of Quantum Information, IPM
- 2023 School & Workshop of Quantum Information & Quantum Gravity, IPM
- 2016, 2017 School of Physics Open Day
- 2015, 2016 IPM (first and second) Workshop on xAct, School of Physics, IPM
- 2016 Recent Trends in String Theory and Related Topics, School of Physics, IPM

reviewer for: Journal of High Energy Physics, Physical Review (A, B, D, E, Letters, X, X Quantum, Research), SciPost Physics, European Physical Journal C, Physics Letters B, Modern Physics Letters A, Physics Conference of Iran, (Iran) National Conference on Particles and Fields

Selected Publications:

- [1] J. Harper, A. Mollabashi, T. Takayanagi and K. Tasuki, “Multientropy and the dihedral measures at quantum critical points,” [Phys. Rev. Res. **7**, no.4, 043194 \(2025\)](#).
- [2] A. Mollabashi and S. Rahimi-Keshari, “Information Scrambling in Bosonic Gaussian Dynamics,” [Phys. Rev. E, **112**, 034213 \(2025\)](#).
- [3] K. Doi, J. Harper, A. Mollabashi, T. Takayanagi and Y. Taki, “Pseudo Entropy in dS/CFT and Time-like Entanglement Entropy,” [Phys. Rev. Lett. **130** \(2023\), 031601](#)
- [4] R. Mozaffar and A. Mollabashi, “On the Time Scaling of Entanglement in Integrable Scale-Invariant Theories,” [Phys. Rev. Res., **4**, L022010 \(2022\)](#),
- [5] A. Mollabashi, N. Shiba, T. Takayanagi, K. Tamaoka and Z. Wei, “Aspects of Pseudo Entropy in Field Theories,” [Phys. Rev. Res., **3**, 033254 \(2021\)](#),
- [6] A. Mollabashi, N. Shiba, T. Takayanagi, K. Tamaoka and Z. Wei, “Pseudo Entropy in Free Quantum Field Theories,” [Phys. Rev. Lett., **126**, 081601 \(2021\)](#),
- [7] J. Cotler, M. R. M. Mozaffar, A. Mollabashi and A. Naseh, “Entanglement Renormalization for Weakly Interacting Fields,” [Phys. Rev. D **99**, no. 8, 085005 \(2019\)](#),
- [8] M. R. M. Mozaffar and A. Mollabashi, “Entanglement in Lifshitz-type Quantum Field Theories,” [JHEP **1707**, 120 \(2017\)](#),
- [9] A. Mollabashi, M. Nozaki, S. Ryu, and T. Takayanagi, “Holographic Geometry of cMERA for Quantum Quenches and Finite Temperature”, [JHEP **1304**, 098](#),

Selected Invited Talks:

- “Does Scrambling of Quantum Information Imply Quantum Chaos?”, Sharif University of Technology, 12 Nov., 2024.
- “Information Scrambling in Bosonic Harmonic Models”, 13th (online) Crete Regional Meeting in String Theory, Orthodox Academy of Crete, 2 July, 2024.
- “Time-like Entanglement Entropy”, Yanqi Lake Beijing Institute of Mathematical Sciences and Applications (BIMSA), Tsinghua University, Beijing, June 22, 2023.
- “Time-like Entanglement Entropy”, Kavli Institute for Theoretical Sciences, UCAS, Beijing, June 21, 2023.
- “Time scaling of entanglement in integrable scale-invariant theories,” Frontiers of Holographic Duality-4, Steklov Mathematical Institute, Moscow, 14 Dec. 2022 (online).
- “Entanglement in Lifshitz Harmonic Lattice Models”, Francqui Symposium on Wavefunctions and Entanglement in Quantum Field Theory, University Foundation, Brussels 18 Oct. 2019
- “Entanglement in Lifshitz Field Theories”, 10th Crete Regional Meeting in String Theory, Orthodox Academy of Crete, Kolymbari, 17 Sep. 2019
- “Propagation of Entanglement in Lifshitz Field Quantum Theories”, Institute for Theoretical Physics, TU Vienna, 1 Aug. 2019

- “Universal Scaling in Fast Quenches Near Lifshitz-Like Fixed Points”, Workshop on Quantum Information and String Theory 2019, YITP, Kyoto, 5 June 2019
- “Perturbative cMERA RG Circuits for Scalar Theory”, Workshop on Tensor Networks from Simulation to Holography II, John von Neumann-Institute for Computing, DESY, Zeuthen, 4 Mar. 2019
- “Entanglement Renormalization for Weakly Interacting Fields”, Max Planck Institute of Quantum Optics, Garching, 14 Nov. 2018
- “What can we learn from entanglement in field theories”, Arnold-Sommerfeld Center for Theoretical Physics, Ludwig Maximilian University, Munich, 24 Oct. 2018
- “Propagation of Entanglement in Lifshitz QFTs”, ‘GQFI Workshop II’, Albert Einstein Institute, Potsdam, 2 Oct. 2018
- “RG Circuits for Weakly Interacting Theories”, ‘Workshop on AQFT, Modular Techniques, and Rényi Entropy’, Albert Einstein Institute, Potsdam, 2 March 2018
- “Field Space Entanglement: Scalar Fields”, Nordic Institute for Theoretical Physics, Stockholm, 19 Sept. 2016
- “Field Space Entanglement: Scalar Fields”, University of Geneva, Geneva, 15 Sept. 2016