

DEBANJAN CHOWDHURY

CONTACT INFORMATION

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Cornell University
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RESEARCH INTERESTS

Developing new numerical methods for solving the many-electron problem, Quantum spin-liquids, Quantum transport in non-Fermi liquids, Quantum phase transitions in strongly correlated systems, Unconventional superconductivity, Strong correlations in moiré superlattices, Quantum chaos and information scrambling in interacting systems.

EMPLOYMENT

Assistant Professor, January 2020 - onwards.
Cornell University, Ithaca NY, USA.
Gordon and Betty Moore Foundation Fellow, July 2016 - June 2019.
Massachusetts Institute of Technology (MIT), Cambridge MA, USA.

EDUCATION

Ph.D. in Physics, May 2016.
Harvard University, Cambridge MA, USA.
Advisor: Prof. Subir Sachdev
Thesis: *Interplay of broken symmetries and quantum criticality in correlated electronic systems.*

A.M. (Master of Arts) in Physics, May 2012.
Harvard University, Cambridge MA, USA.

M.Sc. (Master of Science-Integrated) in Physics, July 2005 - May 2010.
Indian Institute of Technology, Kanpur, India.

SELECTED HONORS

Alfred P. Sloan Research Fellow in Physics, 2023

NSF CAREER Award, 2023.

Gordon and Betty Moore foundation Fellowship (2016-2019), awarded by the Massachusetts Institute of Technology, USA.

Graduate Society Research Fellowship (2014-2015), awarded by the Graduate school of Arts and Sciences, Harvard University, USA.

E.M. Purcell Fellowship (2010-2011), Department of Physics, Harvard University, USA.

Feinberg Graduate School fellowship (2013), Weizmann Institute of Science, Rehovot, Israel.

Kishore Vaigyanik Protsahan Yojana (KVPY) Fellowship (2006-2010), awarded by the Department of Science & Technology - Govt. of India

1. R. Mukherjee[†], H. Guo[†], K. Lewellen, Debanjan Chowdhury, *Arresting Quantum Chaos Dynamically in Transmon Arrays*, arXiv:2405.14935 (2024).
2. H. Guo, R. Mukherjee, Debanjan Chowdhury, *Dynamical Freezing in Exactly Solvable Models of Driven Chaotic Quantum Dots*, arXiv:2405.01627 (2024).
3. X. Wang, J.F. Mendez-Valderrama, J.S. Hofmann, Debanjan Chowdhury, *Intertwined magnetism and superconductivity in isolated correlated flat bands*, arXiv:2402.09506 (2024).
4. S. Kim, M. Saad, D. Mao, A. Agarwala, Debanjan Chowdhury, *Quasicrystalline Spin Liquid*, arXiv:2402.07971 (2024).
5. J.F. Mendez-Valderrama, D. Mao, Debanjan Chowdhury, *A theory for the low-energy optical sum-rule in moiré graphene*, arXiv:2312.03819 (2023).
6. W. Zhao[†], B. Shen[†], Z. Tao[†], S. Kim, P. Knüppel, Z. Han, Y. Zhang, K. Watanabe, T. Taniguchi, Debanjan Chowdhury, J. Shan, K.F. Mak, *Emergence of ferromagnetism at the onset of moiré Kondo breakdown*, arXiv:2310.06044 (2023).
7. X. Wang, R. Moessner and Debanjan Chowdhury, *Interaction-mitigated Landau damping*, **Physical Review B** **109**, L121102 (2024). (**Letter**)
8. T.G. Kiely and Debanjan Chowdhury, *Continuous Wigner-Mott Transition at $\nu = 1/5$* , arXiv:2305.13355 (2023).
9. D. Mao and Debanjan Chowdhury, *Upper bounds on superconducting and excitonic phase-stiffness for interacting isolated narrow bands*, **Physical Review B**, **109**, 024507 (2024). (**Editors' Suggestion**)
10. Z. Yang, B. Fauque, T. Nomura, T. Shitaokoshi, S. Kim, Debanjan Chowdhury, Z. Pribulova, J. Kacmarcik, A. Pourret, G. Knebel, D. Aoki, T. Klein, D. K. Maude, C. Marcenat, Y. Kohama, *Unveiling the double-peak structure of quantum oscillations in the specific heat*, **Nature Communications** **14**, 7006 (2023).
11. J.F. Mendez-Valderrama[†], E. Tulipman[†], E. Zhakina, A.P. Mackenzie, E. Berg and Debanjan Chowdhury, *T -linear resistivity from magneto-elastic scattering: application to PdCrO_2* , **Proceedings of the National Academy of Sciences** **120** (36), e2305609120 (2023).
12. E. Zhakina, R. Daou, A. Maignan, P.H. McGuinness, M. König, H. Rosner, S. Kim, S. Khim, R. Grasset, M. Konczykowski, E. Tulipman, J.F. Mendez-Valderrama, Debanjan Chowdhury, E. Berg, and A.P. Mackenzie, *Investigation of Planckian behavior in a high-conductivity oxide: PdCrO_2* , **Proceedings of the National Academy of Sciences** **120** (36), e2307334120 (2023).

*<http://scholar.google.com/citations?user=uzOuvIIAAAAJ&hl=en>

13. S.J. Thornton, D. Liarte, P. Abbamonte, J.P. Sethna and Debanjan Chowdhury, *Jamming and unusual charge density fluctuations of strange metals*, **Nature Communications** **14**, 3919 (2023).
14. D. Mao and Debanjan Chowdhury, *Diamagnetic response and phase stiffness for interacting isolated narrow bands*, **Proceedings of the National Academy of Sciences** **120** (11), e2217816120 (2023).
15. X. Wang and Debanjan Chowdhury, *Collective density fluctuations of strange metals with critical Fermi surfaces*, **Physical Review B** **107**, 125157 (2023). (Editors' Suggestion)
16. A.J. McRoberts[†], J.F. Mendez-Valderrama[†], R. Moessner and Debanjan Chowdhury, *An intermediate scale theory for electrons coupled to frustrated local-moments*, **Physical Review B** **107**, L020402 (2023). (Letter)
17. S. Kim, A. Agarwala and Debanjan Chowdhury, *Fractionalization and topology in amorphous electronic solids*, **Physical Review Letters** **130**, 026202 (2023).
18. S. Kim, T. Senthil and Debanjan Chowdhury, *Continuous Mott transition in moiré semiconductors: role of long-wavelength inhomogeneities*, **Physical Review Letters** **130**, 066301 (2023).
19. J. Hofmann, E. Berg and Debanjan Chowdhury, *Superconductivity, charge density wave and supersolidity in flat bands with tunable quantum metric*, **Physical Review Letters** **130**, 226001 (2023).
20. S. Xie, B.D. Faeth, Y. Tang, L. Li, E. Gerber, C.T. Parzyck, Debanjan Chowdhury, Y.-H. Zhang, C. Jozwiak, A. Bostwick, E. Rotenberg, E.-A. Kim, J. Shan, K.F. Mak and K.M. Shen, *Strong interlayer interactions in bilayer and trilayer moiré superlattices*, **Science Advances** **8**, eabk1911 (2022).
21. D.B. Liarte, S. Thornton, E. Schwen, I. Cohen, Debanjan Chowdhury, and J.P. Sethna, *Universal scaling for disordered viscoelastic matter II: Collapses, global behavior and spatio-temporal properties*, arXiv:2202.13933 (2022)
22. D.B. Liarte, S. Thornton, E. Schwen, I. Cohen, Debanjan Chowdhury, and J.P. Sethna, *Universal scaling for disordered viscoelastic matter near the onset of rigidity*, **Physical Review E** **106**, L052601 (2022). (Letter)
23. S. Musser, T. Senthil and Debanjan Chowdhury, *Theory of a continuous bandwidth-tuned Wigner-Mott transition*, **Physical Review B** **106**, 155145 (2022).
24. S. Musser, Debanjan Chowdhury, P.A. Lee and T. Senthil, *Interpreting Angle Dependent Magnetoresistance in Layered Materials: Application to Cuprates*, **Physical Review B** **105**, 125105 (2022).
25. [Review] Debanjan Chowdhury, A. Georges, O. Parcollet and S. Sachdev, *Sachdev-Ye-Kitaev Models and Beyond: A Window into Non-Fermi Liquids*, **Reviews of Modern Physics** **94**, 035004 (2022).

26. J. Hofmann, Debanjan Chowdhury, S.A. Kivelson and E. Berg, *Heuristic bounds on superconductivity and how to exceed them*, **npj Quantum Materials** **7**, 83 (2022).
27. T. Li, S. Jiang, L. Li, Y. Zhang, K. Kang, J. Zhu, K. Watanabe, T. Taniguchi, Debanjan Chowdhury, L. Fu, J. Shan and K.F. Mak, *Continuous Mott transition in semiconductor moiré superlattices*, **Nature** **597**, 350 (2021).
28. C. Lewandowski, S. Nadj-Perge and Debanjan Chowdhury, *Does filling-dependent band renormalization aid pairing in twisted bilayer graphene?*, **npj Quantum Materials** **6**, 82 (2021).
29. J.F. Mendez-Valderrama and Debanjan Chowdhury, *Bad metallic transport in geometrically frustrated models*, **Physical Review B** **103**, 195111 (2021).
30. C. Lewandowski, Debanjan Chowdhury and J. Ruhman, *Pairing in magic-angle twisted bilayer graphene: role of phonon and plasmon umklapp*, **Physical Review B** **103**, 235401 (2021). (Editors' Suggestion)
31. L. Zou and Debanjan Chowdhury, *Deconfined metal-insulator transitions in quantum Hall bilayers*, **Physical Review Research** **2**, 032071(R) (2020). (Rapid Communication).
32. L. Zou and Debanjan Chowdhury, *Deconfined metallic quantum criticality: a $U(2)$ gauge theoretic approach*, **Physical Review Research** **2**, 023344 (2020).
33. J. Hofmann, E. Berg and Debanjan Chowdhury, *Superconductivity, pseudogap and phase separation in topological flat bands*, **Physical Review B** **102**, 201112(R) (2020). (Editors' Suggestion)
34. [Review] Debanjan Chowdhury and E. Berg, *The unreasonable effectiveness of Eliashberg theory for pairing of non-Fermi liquids*, **Annals of Physics** **417**, 168125 (2020). Special issue: *Dedicated to Gerasim Eliashberg*.
35. Debanjan Chowdhury and E. Berg, *Intrinsic superconducting instabilities of a solvable example of incoherent metal*, **Physical Review Research** **2**, 013301 (2020).
36. D. Mao, Debanjan Chowdhury, T. Senthil, *Slow scrambling and hidden integrability in a random rotor model*, **Physical Review B** **102**, 094306 (2020).
37. Y. Cao[†], Debanjan Chowdhury[†], D. Rodan-Legrain, O Rubies-Bigorda, K. Watanabe, T. Taniguchi, T. Senthil and P. Jarillo-Herrero, *Strange metal in magic-angle graphene with universal Planckian dissipation*, **Physical Review Letters** **124**, 076801 (2020). (Editors' Suggestion) (Featured in Physics)
- [†] These authors contributed equally.
38. T.A. Webb, M.C. Boyer, Y. Yin, Debanjan Chowdhury, Y. He, T. Kondo, T. Takeuchi, H. Ikuta, E.W. Hudson, J.E. Hoffman and M.H. Hamidian, *Density wave probes cuprate quantum phase transition*, **Physical Review X** **9**, 021021 (2019).

39. A. Zong, X. Shen, A. Kogar, L. Ye, C. Marks, Debanjan Chowdhury, T. Rohwer, B. Freelon, S. Weathersby, R. Li, J. Yang, J. Checkelsky, X. Wang and N. Gedik, *Ultrafast manipulation of mirror domain walls in a charge density wave*, **Science Advances** **4**, eaau5501 (2018).
40. Debanjan Chowdhury, Y. Werman, E. Berg and T. Senthil, *Translationally invariant non-Fermi liquid metals with critical Fermi-surfaces: Solvable models*, **Physical Review X** **8**, 031024 (2018).
41. Debanjan Chowdhury, B. Skinner and P.A. Lee, *Semiclassical theory of the tunneling anomaly in partially spin-polarized compressible quantum Hall states*, **Physical Review B** **97**, 195114 (2018).
42. A. Klein, S. Lederer, Debanjan Chowdhury, E. Berg and A.V. Chubukov, *Dynamical susceptibility of a near-critical non-conserved order parameter and B_{2g} Raman response in Fe-based superconductors*, **Physical Review B** **98**, 041101(R) (2018). (**Rapid Communication**).
43. Debanjan Chowdhury, B. Skinner and P.A. Lee, *Effect of magnetization on the tunneling anomaly in compressible quantum Hall states*, **Physical Review Letters** **120**, 266601 (2018).
44. I. Sodemann, Debanjan Chowdhury and T. Senthil, *Quantum oscillations in insulators with neutral Fermi-surfaces*, **Physical Review B** **97**, 045152 (2018).
45. A. Klein, S. Lederer, Debanjan Chowdhury, E. Berg and A.V. Chubukov, *Dynamical susceptibility near a long-wavelength critical point with a non-conserved order parameter*, **Physical Review B** **97**, 155115 (2018).
46. Debanjan Chowdhury, I. Sodemann and T. Senthil, *Mixed-valence insulators with neutral Fermi-surfaces*, **Nature Communications** **9** 1766, (2018).
47. A.A. Patel, Debanjan Chowdhury, S. Sachdev and B. Swingle, *Quantum butterfly effect in weakly interacting disordered metals*, **Physical Review X** **7**, 031047 (2017).
48. Debanjan Chowdhury and B. Swingle, *Onset of many-body chaos in the $O(N)$ model*, **Physical Review D** **96**, 065005 (2017).
49. B. Swingle and Debanjan Chowdhury, *Slow scrambling in disordered quantum systems*, **Physical Review B** **95**, 060201(R) (2017). (**Rapid Communication**) (**Editors' Suggestion**)
50. A.A. Patel and Debanjan Chowdhury, *Two dimensional spin liquids with \mathbb{Z}_2 topological order in an array of quantum wires*, **Physical Review B** **94**, 195130 (2016).
51. [Review] S. Sachdev and Debanjan Chowdhury, *The novel metallic states of the cuprates: topological Fermi liquids and strange metals*, **Progress of Theoretical and Experimental Physics** **12C102**, (2016).
Special issue: "Nambu, A foreteller of Modern Physics III".
52. A.A. Patel, Debanjan Chowdhury, A. Allais and S. Sachdev, *Confinement transition to density wave order in metallic doped spin liquids*, **Physical Review B** **93**, 165139 (2016).

53. Y. Wang, Debanjan Chowdhury and A.V. Chubukov, *Fluctuating charge order in the cuprates: spatial anisotropy and feedback from superconductivity*, **Physical Review B** **92**, 161103(R) (2015). (**Rapid Communication**)
54. Debanjan Chowdhury, J. Orenstein, S. Sachdev and T. Senthil, *Phase transition beneath the superconducting dome in $BaFe_2(As_{1-x}P_x)_2$* , **Physical Review B** **92**, 081113(R) (2015). (**Rapid Communication**)
55. [Review] Debanjan Chowdhury and S. Sachdev, *The enigma of the pseudogap phase of the cuprate superconductors*, Invited chapter in the book “Quantum criticality in condensed matter” (World Scientific, ISBN: 978-981-4704-08-3); **arXiv:1501.00002**.
56. Debanjan Chowdhury and S. Sachdev, *Higgs criticality in a two-dimensional metal*, **Physical Review B** **91**, 115123 (2015).
57. Debanjan Chowdhury and S. Sachdev, *Density-wave instabilities of fractionalized Fermi liquids*, **Physical Review B** **90**, 245136 (2014).
58. A. Allais, Debanjan Chowdhury and S. Sachdev, *Connecting high field quantum oscillations to zero-field electron spectral functions in the underdoped cuprates*, **Nature Communications** **5**, 5771 (2014).
59. Debanjan Chowdhury and S. Sachdev, *Feedback of superconducting fluctuations on charge order in the underdoped cuprates*, **Physical Review B** **90**, 134516 (2014).
60. M. Punk, Debanjan Chowdhury and S. Sachdev, *Topological excitations and the dynamic structure factor of spin-liquids on the kagome lattice*, **Nature Physics** **10**, 289-293 (2014).
61. Debanjan Chowdhury, B. Swingle, E. Berg and S. Sachdev, *Singularity of the London penetration depth at quantum critical points in superconductors*, **Physical Review Letters** **111**, 157004 (2013).
62. Debanjan Chowdhury, S. Raju, S. Sachdev, A. Singh and P. Strack, *Multipoint correlators of conformal field theories: implications for quantum critical transport*, **Physical Review B** **87**, 085138 (2013).
63. P. Mandal, Debanjan Chowdhury, S.S. Banerjee and T. Tamegai, *High sensitivity differential magneto-optical imaging with a compact Faraday modulator*, **Review of Scientific Instruments** **83**, 123906 (2012).
64. D. Bergeron, Debanjan Chowdhury, M. Punk, S. Sachdev and A.-M.S. Tremblay, *Breakdown of Fermi liquid behavior at the $(\pi, \pi) = 2\mathbf{k}_F$ spin-density wave quantum critical point: the case of electron-doped cuprates*, **Physical Review B** **86**, 155123 (2012). (**Editors’ suggestion**)
65. N.W.Goehring, P.K. Trong, J.S. Bois, Debanjan Chowdhury, E.M. Nicola, A.A. Hyman and S.W. Grill, *Polarization of PAR proteins by advective triggering of a pattern forming system*, **Science** **334**, 6059, 1137-1141 (2011). (**Editors’ choice**)
Highlighted in the

- **Dispatch** article in Current Biology **22**, 2, R58-61 (2012)

- **Preview** article in *Developmental Cell* **21**, 6, 981-982 (2011)

66. Debanjan Chowdhury, E. Berg and S. Sachdev, *Nematic order in the vicinity of a vortex in superconducting FeSe*, **Physical Review B** **84**, 205113 (2011).
67. N.W. Goehring, Debanjan Chowdhury, S.W. Grill, A.A. Hyman, *FRAP analysis of membrane-associated proteins: lateral diffusion and membrane-cytoplasmic exchange*, **Biophysical Journal** **99**, 8, 2443-2452 (2010).
68. Debanjan Chowdhury and M.C. Cross, *Synchronization of oscillators with long-range power law interactions*, **Physical Review E** **82**, 016205 (2010).
69. Debanjan Chowdhury, U. Divakaran and A. Dutta, *Adiabatic dynamics in passage across quantum critical lines and gapless phases*. **Physical Review E** **81**, 012101 (2010).
70. A. Garai, Debanjan Chowdhury, D. Chowdhury and T.V. Ramakrishnan, *Stochastic kinetics of ribosomes: single motor properties and collective behavior*. **Physical Review E** **80**, 011908 (2009).
Also selected for the July 15, 2009 issue of *Virtual Journal of Biological Physics Research*.
71. Debanjan Chowdhury, *Searching for targets on a model DNA: Effects of intersegment hopping, detachment and reattachment*, **International Journal of Modern Physics C (IJMPC)** **20**, 6, 817 (2009).

TEACHING

Phys 3727: <i>Advanced Electricity & Magnetism</i> (Undergraduate level)	Fall 2023
Phys 7636: <i>Solid-State Physics II</i> (Graduate level)	Spring 2023, 2024
Phys 2218: <i>Physics III: Waves & Thermal Physics</i> (Undergraduate level)	Spring 2022
Phys 4230: <i>Statistical Thermodynamics</i> (Undergraduate level)	Fall 2021
Phys 6574: <i>Applications of Quantum Mechanics II</i> (Graduate level)	Spring 2021
Phys 7687: <i>Strongly Correlated Phases of Quantum Matter</i> (Graduate level)	Fall 2020
Phys 4490: <i>Independent Study in Physics</i> (Advising a sophomore on an original research project)	Fall 2020
Phys 2208: <i>Fundamentals of Physics II</i> , Supporting staff (Undergraduate level)	Spring 2020

INVITED TALKS

- KITP workshop on *Correlated gapless quantum matter*, Kavli Institute for Theoretical Physics, UC Santa Barbara, May 9, 2024
- Condensed Matter Physics seminar, Harvard University, April 4, 2024
- Pro-QM seminar, Columbia University, March 20, 2024
- APS March Meeting — Minneapolis, Focus session on 2D Materials, March 7, 2024

ICTS program on *Stability of quantum matter in and out of equilibrium at various scales*, Bengaluru, January 15, 2024

KIAS-IBS-PCS Workshop on *Correlation, & Topology in Quantum Matter*, Seoul, December 19, 2023

Workshop on *Recent advances in superconductivity: Theory and Experiment*, University of Florida, Gainesville, December 14, 2023

Quantum matter seminar, University of Toronto, November 1, 2023

Google Quantum AI group, Santa Barbara, September 22, 2023

KITP conference on *Electronic correlations beyond the quasiparticle paradigm*, Kavli Institute for Theoretical Physics, UC Santa Barbara, September 19, 2023

KITP workshop on *Quantum materials with and without quasiparticles*, Kavli Institute for Theoretical Physics, UC Santa Barbara, September 7, 2023

Theory seminar, Laboratoire de Physique et Modélisation des Milieux Condensés, Grenoble, June 16, 2023

Quantum matter seminar, University of Waterloo, April 12, 2023.

CMTC JLDS seminar, Condensed matter theory center, University of Maryland College Park, April 4, 2023.

CM-AMO seminar, University of Michigan Ann Arbor, March 28, 2023.

CAMP seminar, Pennsylvania State University State College, March 13, 2023.

Condensed matter seminar, Indian Institute of Technology Kanpur, January 11, 2023.

Physics Colloquium, Indian Institute of Technology Kanpur, January 10, 2023.

SRITP conference on *A Quantum Many-body Handshake: Theory and Simulation meet Experiment*, Weizmann Institute of Science, Rehovot, December 11, 2022.

Physics Colloquium, Bar-Ilan University, December 5, 2022.

Chez Pierre seminar, MIT, November 14, 2022.

Condensed Matter Physics seminar, Harvard University, November 10, 2022.

Theory seminar, University of Oslo, September 21, 2022.

QDev seminar, Niels Bohr Institute, University of Copenhagen, September 19, 2022.

ICTP conference on *Strongly correlated matter: From quantum criticality to flat bands*, Trieste, August 26, 2022.

CT.QMAT-22 conference on *Complexity and topology in quantum matter*, Würzburg, July 27, 2022.

Condensed Matter seminar, Max-Planck-Institut für Physik Komplexer Systeme, Dresden, July 19,

2022.

Condensed matter seminar [†], Ohio State University, April 11, 2022.

Condensed Matter seminar [†], UC San Diego, February 16, 2022.

QMAT-21 conference, Tata Institute of Fundamental Research [†], December 10, 2021.

Condensed Matter Theory tutorial+seminar [†], Caltech, October 28, 2021.

Physics Colloquium [†], The City College of New York, September 29, 2021.

SPICE workshop on *Coherent order and transport in spin active systems: Interplay between magnetism and superconductivity* [†], Johannes Gutenberg Universität, Mainz, Germany, November 18, 2020.

CMSA Quantum Matter seminar [†], Harvard University, July 9, 2020.

Matter and Radiation seminar [†], University of Stavanger, June 3, 2020.

ICTS meeting on *Novel phases of quantum matter*, International Center for Theoretical Sciences, Bangalore, December 23, 2019.

Condensed Matter Theory seminar, Karlsruhe Institute of Technology, Karlsruhe, October 21, 2019.

Condensed Matter Theory seminar, Ludwig-Maximilians Universität, Munich, October 18, 2019.

Condensed Matter Theory seminar, Technische Universität, Munich, October 16, 2019.

Condensed Matter Theory seminar, Technische Universität, Dresden, October 4, 2019.

Lectures at International Max-Planck Research School (IMPRS) organized by Max-Planck-Institut für Physik Komplexer Systeme, Karpacz, September 2 - 4, 2019.

Condensed Matter seminar, Max-Planck-Institut für Physik Komplexer Systeme, Dresden, August 29, 2019.

SFB Colloquium, Institute for theoretical Physics, University of Cologne, August 26, 2019.

Condensed Matter seminar, Bar-Ilan University, Ramat-Gan, July 7, 2019.

Condensed Matter seminar, Weizmann Institute of Science, Rehovot, July 3, 2019.

Theoretical Physics seminar, Yale University, April 1, 2019.

Physics Colloquium, Iowa State University, Ames, March 27, 2019.

Physics Colloquium, University of Texas, Austin, February 28, 2019.

LASSP seminar, Cornell University, Ithaca, February 19, 2019.

Physics Colloquium, New York University, New York, February 13, 2019.

[†]Delivered via zoom

Seminar, Center for Computational Quantum Physics (CCQ), Flatiron Institute, New York, February 12, 2019.

Condensed Matter seminar, University of Pennsylvania, Philadelphia, February 6, 2019.

Physics Colloquium, Ohio State University, Columbus, January 31, 2019.

KITP Rapid Response workshop on *Correlations in Moire flat bands*, Kavli Institute for Theoretical Physics, UC Santa Barbara, January 22, 2019.

Condensed Matter, Atomic and Molecular Physics seminar, Pennsylvania State University, State College, January 16, 2019.

Condensed Matter Theory seminar, CMTC, University of Maryland, College Park, October 23, 2018.

MPS conference on *Ultra Quantum Matter II*, Simons Foundation, New York, August 22, 2018.

Kadanoff seminar, Kadanoff Center for Theoretical Physics, University of Chicago, May 22, 2018.

Condensed Matter Physics seminar, Brown University, Providence, February 6, 2018.

Condensed Matter seminar, National high magnetic field laboratory, Tallahassee, October 13, 2017.

Condensed Matter Theory seminar, Ludwig-Maximilians Universität, Munich, September 7, 2017.

Condensed Matter Theory seminar, Technische Universität, Dresden, September 5, 2017.

Condensed Matter Theory seminar, Technische Universität, Munich, August 28, 2017.

KITP workshop on *Intertwined order and fluctuations in quantum materials*, Kavli Institute for Theoretical Physics, UC Santa Barbara, July 27, 2017.

Condensed Matter Theory seminar, MIT, Cambridge, April 28, 2017.

Condensed Matter Physics seminar, Caltech, Pasadena, April 12, 2017.

Condensed Matter Theory seminar, CMTC, University of Maryland, College Park, March 7, 2016.

Condensed Matter Theory seminar, ICMT, University of Illinois, Urbana-Champaign, December 1, 2015.

Condensed Matter Theory seminar, MIT, Cambridge, November 5, 2015.

Condensed Matter Physics seminar, Kavli Institute for Theoretical Physics, UC Santa Barbara, October 28, 2015.

Condensed Matter Physics seminar, Caltech, Pasadena, October 26, 2015.

Strongly Correlated Theory seminar, LASSP, Cornell University, Ithaca, October 15, 2015.

Quantum Design conference, Max-Planck-Institut für Physik Komplexer Systeme, Dresden, July 22, 2015.

Condensed Matter Theory seminar, Max-Planck-Institut für Physik Komplexer Systeme, Dresden,

July 9, 2015.

Solid State Theory seminar, Ludwig-Maximilians Universität, Munich, June 25, 2015.

Fermions-2015 conference, Ruprecht Karls Universität, Heidelberg, April 20, 2015.

Center for Condensed Matter Theory seminar, Indian Institute of Science, Bangalore, January 9, 2015.

ICTS seminar, International Center for Theoretical Sciences, Bangalore, January 8, 2015.

Theoretical Physics seminar, Indian Association for the Cultivation of Science, Kolkata, December 29, 2014.

Condensed Matter Theory seminar, MIT, Cambridge, November 18, 2014.

Gordon Research Seminar - Correlated Electron Systems, Mt. Holyoke College, South Hadley, June 22, 2014.

Condensed Matter Physics seminar, Indian Institute of Technology Kanpur, January 15, 2014.

Condensed Matter Physics seminar, Weizmann Institute of Science, Rehovot, December 25, 2013.

Scientific departmental conference-Weizmann Institute of Science, Ma'alot Tarshiha, December 18, 2013.

OTHER ACTIVITIES AT CORNELL Member, Executive Committee, Kavli Institute at Cornell, September 2022 - onwards

Member, Graduate Admissions Committee, July 2021 - onwards

Member, Cornell Center for Materials Research, NSF MRSEC, March 2021 - onwards

Member, Climate, Equity, Diversity & Inclusion committee, July 2020 - July 2022.

Member, Physics colloquium committee, July 2020 - June 2021

LASSP & AEP seminar committee, Spring 2022

EXTERNAL FUNDING

NSF CAREER: *Theories of Gapless Quantum Matter Beyond Quasiparticles* (USD \$607,668) 04/23-03/28

Alfred P. Sloan Research Fellowship (USD \$75,000) : 09/23 - 08/25

US-Israel Binational Science Foundation (BSF): *Simulating exotic magnetism and superconductivity in hybrid quantum materials* (USD \$188,800; Co-PI: Prof. J. Ruhman, Bar-Ilan University) 10/21-09/25

NSF-XSEDE/ACCESS: *Quantum Monte Carlo studies of strongly correlated phases and superconductivity in moiré materials and beyond* (approx 9 million core hours) 03/21 - 09/23

PROFESSIONAL ACTIVITIES

Referee for : Nature, Science, Nature Physics, Nature Communications, Nature Quantum Materials, Physical Review Letters (PRL), Physical Review X (PRX), Physical Review B (PRB), SciPost,

Scientific Reports, Europhysics Letters (EPL), Journal of Statistical Mechanics: Theory and Experiment, The European Physical Journal B (EPJB), National Science Foundation(NSF), Department of Energy (DoE), Isaac Newton Trust.

Co-Chair, Gordon Research Seminar, Correlated Electron Systems, June 25 - 26, 2022.

Co-organizer, Recent developments in strongly correlated quantum matter, NORDITA, June 16 - July 2, 2022.