

# **PHILIP PHILLIPS**

## **Address**

Department of Physics  
University of Illinois at Urbana-Champaign  
1110 West Green Street  
Urbana, IL 61801-3080

## **Personal**

Born June 28, 1958 in Scarborough, Tobago, West Indies  
Naturalized U.S. Citizen: October 30, 1981, Seattle, WA.

## **I. EDUCATION**

BS-Walla Walla College 1979  
PhD-University of Washington 1982  
Miller Fellow at University of California, Berkeley 1982 - 1984

## **II. PERSONAL HISTORY AND PROFESSIONAL EXPERIENCE**

### **List of Academic Positions since Final Degree**

August 2000 - Present, Professor of Physics, Department of Physics  
University of Illinois, Urbana, Illinois

August 1993 - 1999, Associate Professor, Department of Physics  
University of Illinois, Urbana, Illinois

1990-July 1993 Associate Professor, Department of Chemistry  
Massachusetts Institute of Technology, Cambridge, Massachusetts

1984-1990 Assistant Professor of Chemistry  
Massachusetts Institute of Technology, Cambridge, Massachusetts

Fall, 1988, Visiting Fellow  
Balliol College, Oxford University

Spring, 1987, Visiting Professor,  
Michigan State University, East Lansing, Michigan

1979-1981 Graduate Research Assistant,  
University of Washington

## **Honors, Recognitions, and Outstanding Achievements**

2020 Fellow of the American Academy of Arts and Sciences

2015 John S. Guggenheim Fellow

2012 Fellow of the American Association for the Advancement of Science

2009-2011 NSF American Competitiveness and Innovation Fellow

2005 College of Engineering Bliss Faculty Scholar

2004 University Scholar

2002 American Physical Society Fellow

2000 Bouchet Award, APS.

1998 Fellow, Center for Advanced Study, Univ. of Illinois at Urbana-Champaign.

1998 Senior Xerox Award for Faculty Research, College of Engineering, Univ. of Illinois at Urbana-Champaign.

1981-1984 Miller Postdoctoral Fellowship, Univ. of California, Berkeley, CA.

1981-1982 Danforth-Compton Predoctoral Fellowship University of Washington, Seattle

## **Review Panels (e.g., for Governmental Agencies, Educational Institutions)**

Editor for Reviews of Modern Physics, 2022-present

Board of Reviewing Editors for Science, 2021-present

Advisory Board for the American Association for the Advancement of Science 2013-2016

Gordon Research Conference Board, 2007-2013

External review panel for MRL, Cornell University, 2010.

KITP Advisory Board 2009-2013

Chairman, Nominating Committee for the APS, 2006-2008

Committee on Committees for the APS, 2002-2004

Executive Councilor for the APS, 2002-2004

General Councilor for the APS, 2000-2002

Nanotechnology Panel for the White House Office of Science and Tech. Policy, 1999

Frontiers of Science Organizing Committee, Natl. Academy of Science, 1998, 1999.

NSF Post-Doctoral Review Panel, 1992.

## **Research Area**

Theoretical condensed matter physics with an emphasis on strong correlations, exactly solvable models for Mottness and non-perturbative approaches including gauge-gravity duality.

## **III. PUBLICATIONS AND CREATIVE WORKS**

### **Books authored or Co-Authored (in print or accepted)**

1. Phillips, P., "Advanced Solid State Physics," Westview Press (Boulder, Co.), 2003 398 pgs.
2. Phillips, P., "Advanced Solid State Physics, Second Edition," Cambridge University Press, 2012, 402 pgs.

### **Edited Volumes**

1. Proceedings of the Mottness and Quantum Criticality Workshop, Annals of Physics, 321 (7), (2006).
2. Phillips, Philip. "Normal State of the Copper Oxide High-Temperature Superconductors." Philosophical Transactions of the Royal Society (A) Mathematical Physical and Engineering Sciences 369, p. 1572-1573 (2011)

### **Chapters in Books (in print or accepted)**

1. Phillips, P., Wu, H.-L., and Dunlap, D. H., "Two Statically-Disordered Models Exhibiting an Absence of Localization," Quantum Fluctuations in Mesoscopic and Macroscopic Systems, Cerdeira, F. Guinea López and U. Weiss, Eds., (World Scientific, 1991), p. 19-27.
2. Phillips, P., Wu, H.-L. and Dunlap, D. H., "Dimers, Repulsions, and the Absence of Localization," in Large-Scale Molecular Systems, W. Gans, A. Blumen, and A. Amann (Plenum Press, 1991) p. 397-401.
3. Phillips, P., Dunlap, D. H., Kundu, K. and Parris, P. E., "A New Look at Hopping, Trapping and Anderson Localization," Proceedings in Physics Series on Disorder and Non-Linearity, (Springer 1989) 39, p. 38-46.
3. The Chemical Potential for Interacting Fermions in a Harmonic Potential, Philip Phillips and Ernest R. Davidson in Local Density Approximations in Quantum Chemistry and Solid-State Physics, J. P. Dahl and J. Avery, eds. (Plenum Press, 1984) p. 43-52.

4. Philip Phillips, Topological Phase Transitions and New Developments <https://doi.org/10.1142/11016> | , Edited By: Lars Brink (Chalmers University of Technology, Sweden), Mike Gunn (University of Birmingham, UK), Jorge V José (Indiana University, USA), John Michael Kosterlitz (Brown University, USA), and Kok Khoo Phua (Nanyang Technological University, Singapore) October 2018, Pages: 264

### **Invited Topical Commentaries**

1. P. Phillips “Fractionalize This,” Nature Physics 6 (12): 931-933 (2010)
2. P. Phillips “From Insulator to Superconductor,” Nature, 406, 687-688 (2000)
3. Phillips, P., and Balatsky, A.-V., “Cracking the Supersolid” Science 8, Vol. 316. no. 5830, pp. 1435 - 1436 (June 2007).
4. Philip W. Phillips, Free at Last: Bose Metal Uncaged, Science, Vol. 366, Issue 6472, pp. 1450-1451 (2019).
5. Philip W. Phillips, Not Just a Phase: Bose Metal Unveiled, Nat. Phys. vol. 12, 206-207 (2016)

### **Bulletins, Reports, or Conference Proceedings**

1. Dunlap, D., Kundu, K. and Phillips, P., “The Absence of Localization in Statically-Disordered Lattices,” J. Lum. 45, 74-75, (1990).
2. Phillips, P. and Wu, H.-L., “The Origin of Extended States in Conducting Polymers,” J. Non-Crystalline Solids, 137-138, 927-930, (1991).
3. Phillips, P., Li, Q., and Cruz, L., “Dimers and Rods in the Metallic State of Polyaniline,” Synth. Met. 57, 4697-4703, (1993).
4. Wan, Y., G. Ortiz, P. Phillips, “Phonon-Induced 2e- Tunneling in GaAs quantum Dots,” J. Liq. Cryst. Mol., 283, 11-16, (1996).
5. Phillips, P., Sachdev, S., Kravchenko, S., Yazdani, A., “Quantum Conductors in a Plane,” Proceedings of the National Academy of Sciences, Vol. 96, 9983-9984 (1999).

### **Articles in Journals (in print or accepted)**

199. Peizhi Mai, Edwin W. Huang, Jiachen Yu, Benjamin E. Feldman & Philip W. Phillips, Interaction-driven spontaneous ferromagnetic insulating states with odd Chern numbers, *Quantum Materials* volume 8, Article number: 14 (2023)
198. Peizhi Mai, Benjamin E. Feldman, and Philip W. Phillips, Topological Mott insulator at quarter filling in the interacting Haldane model, *Phys. Rev. Research* 5, 013162 (2023)
197. Chandan Setty, Jinchao Zhao, Laura Fanfarillo, Edwin W. Huang, Peter J. Hirschfeld, Philip W. Phillips, Kun Yang, Exact solution for finite center-of-mass momentum Cooper pairing, *Phys. Rev. B* 108, 174506 (2023)
196. Peizhi Mai, Jinchao Zhao, Benjamin E. Feldman & Philip W. Phillips,  $1/4$  is the new  $1/2$  when topology is intertwined with Mottness, *Nat. Comm.* 14, 5999 (2023)
195. Jinchao Zhao, Gabriele La Nave, Philip Phillips, Proof of a Stable Fixed Point for Strongly Correlated Electron Matter, *Phys. Rev. B* 108, 165135 – Published 19 October 2023
194. Jin Chen, Xuefei Guo, Christian Boyd, Simon Bettler, Caitlin Kengle, Dipanjan Chaudhuri, Farzaneh Hoveyda, Ali Husain, John Schneeloch, Genda Gu, Philip Phillips, Bruno Uchoa, Tai-Chang Chiang, Peter Abbamonte, Consistency between reflection M-EELS and optical spectroscopy measurements of the long-wavelength density response of  $\text{Bi}_2\text{Sr}_2\text{CaCu}_2\text{O}_{8+x}$ , arXiv:2306.03681 (2023)
193. Philip W. Phillips, Fifty years of Wilsonian renormalization and counting, *Nature Physics* volume 19, pages, 1521–1524 (2023)
192. Peizhi Mai, Edwin W. Huang, Jiachen Yu, Benjamin E. Feldman, Philip W. Phillips, Interaction-driven Spontaneous Ferromagnetic Insulating States with Odd Chern Numbers. *npj Quantum Mater.* 8, 14 (2023).
191. A.A. Husain, M.S. Rack, S. I. Rubeck, X. Guo, B. Uchoa, T.C. Chiang, P. Phillips, P. Abbamonte, et al. Pines' demon observed as a 3D acoustic plasmon in  $\text{Sr}_2\text{RuO}_4$ . *Nature* 621, 66–70 (2023).
190. Bora Basa, Gabriele La Nave, Philip W. Phillips, Kitaev Chain with a Fractional Twist, *Phys. Rev. B* 106, 125109 (2022)
189. Christian Boyd, Luke Yeo, Philip W. Phillips, Probing the bulk plasmon continuum of layered materials through electron energy loss spectroscopy in a reflection geometry, *Phys. Rev. B* 106, 155152 (2022)
188. Philip W. Phillips, Nigel E. Hussey, Peter Abbamonte, Stranger than Metals, *Science*, 377, 1-10 (2022)
187. Jinchao Zhao, Luke Yeo, Edwin Huang, Philip W. Phillips, Thermodynamics of an Exactly Solvable Model for Superconductivity in a Doped Mott Insulator, *Phys. Rev. B* 105, 184509 (2022)

186. Edwin W. Huang, Gabriele La Nave, Philip W. Phillips, Discrete symmetry breaking defines the Mott quartic fixed point, *Nat. Phys.*, 18, 511516 (2022)
185. Jiachen Yu, Benjamin A. Foutty, Zhaoyu Han, Mark E. Barber, Yoni Schattner, Kenji Watanabe, Takashi Taniguchi, Philip Phillips, Zhi-Xun Shen, Steven A. Kivelson, Benjamin E. Feldman, Correlated Hofstadter Spectrum and Flavor Phase Diagram in Magic Angle Graphenem, *Nat. Phys.* 18, 825831 (2021)
184. Bikash Padhi, R. Chitra, Philip W. Phillips, Generalized Wigner crystallization in moiré materials, *Phys. Rev. B* 103, 125146 (2021)
183. Edwin W. Huang, Kridsanaphong Limtragool, Chandan Setty, Ali A. Husain, Matteo Mitrano, Peter Abbamonte, Philip W. Phillips, Extracting correlation effects from Momentum-Resolved Electron Energy Loss Spectroscopy (M-EELS): Synergistic origin of the dispersion kink in  $\text{Bi}_{2.1}\text{Sr}_{1.9}\text{CaCu}_2\text{O}_{8+x}$ , *Phys. Rev. B* 103, 035121 (2021)
182. Bora Basa, Gabriele La Nave, Philip W. Phillips, Nonlocal Conformal Theories Have State-dependent Central Charges, *arXiv:2103.03256* (2021)
181. Matteo Baggioli, Gabriele La Nave, Philip Phillips, Anomalous diffusion and Noether's second theorem, *Phys. Rev. E* 103, 032115 (2021)
180. Philip W. Phillips, Luke Yeo, Edwin W. Huang, Exact Superconducting Instability in a Doped Mott Insulator, *Nature Physics* 16, 1175-1180 (2020)
179. Cunwei Fan, Gabriele La Nave, Philip W. Phillips, Second-order Lovelock Gravity from Entanglement in Conformal Field Theories, *Phys. Rev. D* 104, 126018
178. Philip W. Phillips, Gabriele La Nave, Nöther's Second Theorem as an Obstruction to Charge Quantization, *Springer Proceedings in Mathematics and Statistics*, (2020)
177. Bora Basa, Gabriele La Nave, Philip W. Phillips, Classification of Non-local Actions: Area versus Volume Entanglement Entropy, *Phys. Rev. D* 101, 106006 (2020)
176. Gabriele La Nave, Philip Phillips, Fractional Virasoro Algebras, *Adv. Theor. Math. Phys.*, vol. 23 (2019)
175. Christian Boyd, Philip W. Phillips, Single-parameter scaling in the magnetoresistance of optimally doped  $\text{La}_{2-x}\text{Sr}_x\text{CuO}_4$ , *Phys. Rev. B* 100, 155139 (2019)
174. Gabriele La Nave, Kridsanaphong Limtragool, Philip W. Phillips, Fractional Electromagnetism in Quantum Matter and High-Energy Physics, *Rev. Mod. Phys.*, vol. 91, 021003 (2019)

173. Luke Yeo and Philip W. Phillips, Local entropies across the Mott transition in an exactly solvable, *Phys. Rev. D* 99, 094030 (2019)
172. Bikash Padhi, Philip Phillips, Pressure-Induced Metal-Insulator Transition in Twisted Bi-layer Graphene, *Phys. Rev. B* 99, 205141 – Published 24 May 2019
171. Brandon W. Langley, Udit M. Gupta, and Philip W. Phillips, Quantum critical diffusion and thermodynamics in Lifshitz holography *Phys. Rev. D* 103, 026016 – Published January 22, 2021
170. Zhidong Leong, Kridsanaphong Limtragoon, Chandan Setty, and Philip W. Phillips, Scale invariance as the cause of the superconducting dome in the cuprates, *Phys. Rev. B* 98, 184501 (2018)
169. Bikash Padhi, Chandan Setty, Philip W. Phillips, Doped Twisted Bilayer Graphene near Magic Angles: Proximity to Wigner Crystallization not Mott Insulation, *Nano Lett.* 2018 18 (10) 6175 (2018)
168. Matteo Baggioli, Bikash Padhi, Philip W. Phillips, Chandan Setty, Conjecture on the Butterfly Velocity across a Quantum Phase Transition, *JHEP*, volume 2018, 49 (2018)
167. Chandan Setty, Kridsanaphong Limtragoon, Byron Freelon, Philip W. Phillips, Detecting isotropic density and nematic fluctuations using ultrafast coherent phonon spectroscopy, *Phys. Rev. B* 99, 245157 – Published 28 June 2019
166. Julian May-Mann, Philip W. Phillips, Vanishing Hall Conductance in the Phase Glass Bose Metal at Zero Temperature, *Phys. Rev. B* 97, 024508 (2018)
165. Bikash Padhi, Chandan Setty, Philip W. Phillips, Wigner Crystallization in lieu of Mottness in Twisted Bilayer Graphene, *Nano Lett.* 2018, 18, 10, 6175–6180
164. Matteo Baggioli, Bikash Padhi, Philip W. Phillips, Chandan Setty, Conjecture on the Butterfly Velocity across a Quantum Phase Transition, *JHEP*, volume 2018, article number 49 (2018)
163. Philip Phillips, Chandan Setty, Shuyi Zhang; Absence of a Charge Diffusion Pole at Finite Energies in an Exactly Solvable Interacting Flat Band Model in d-dimensions, *Phys. Rev. B* 97, 195102 (2018)
162. Bikash Padhi, Apoorv Tiwari, Chandan Setty, Philip W. Phillips, Log-rise of the Resistivity in the Holographic Kondo Model, *Phys. Rev. D* 97, 066012 (2018)
161. Kridsanaphong Limtragoon, Philip W. Phillips. Anomalous Dimension of the Electrical Current in the Normal State of the Cuprates from the Fractional Aharonov-Bohm Effect. *Euro. Phys. Lett.* 121, 27003 (2018)
160. Chandan Setty, Yuxuan Wang, Philip W. Phillips, Low energy inelastic response in the superconducting phases of  $\text{PrOs}_4\text{Sb}_{12}$ , *Phys. Rev. B* 96, 054508 (2017)

159. Gabriele La Nave, Philip Phillips, Exact Form of Boundary Operators Dual to Interacting Bulk Scalar Fields in the AdS/CFT Correspondence, arXiv:1702.00038 (2017)
158. Chandan Setty, Philip W. Phillips, Awadhesh Narayan, Quasiparticle interference and resonant states in normal and superconducting line nodal semimetals, Phys. Rev. B 95, 140202 (2017)
157. Chandan Setty, Zhidong Leong, Shuyi Zhang, Philip W. Phillips; Absence of nematic ordering transition in a diamond lattice: Application to FeSc<sub>2</sub>S<sub>4</sub>, Phys. Rev. B 95, 020403 (2017)
156. Zhidong Leong, Chandan Setty, Kridsanaphong Limtragool, Philip W. Phillips, Power-law liquid in cuprate superconductors from fermionic unparticles, Phys. Rev. B 96, 205101 (2017)
155. Kridsanaphong Limtragool, Philip W. Phillips; Violation of f-sum Rule with Generalized Kinetic Energy, Phys. Rev. B 95, 195118 (2017)
154. Kridsanaphong Limtragool, Zhidong Leong, Philip W. Phillips, Absence of Luttinger's theorem for fermions with power-law Green functions, SciPost Phys. 5, 049 (2018) · published 16 November 2018
153. Gabriele La Nave, Philip Phillips, Anomalous Dimensions for Boundary Conserved Currents in Holography via the Caffarelli-Silvestri Mechanism for p-forms, Comm. Math. Phys. 366, 119-137 (2019)
152. Kridsanaphong Limtragool, Chandan Setty, Zhidong Leong, Philip W. Phillips; Realizing infrared power-law liquids in the cuprates from unparticle interactions, Phys. Rev. B 94, 235121 (2016)
151. Zhidong Leong, Kridsanaphong Limtragool, Chandan Setty, Philip W. Phillips, Scale-invariance as the cause of the superconducting dome in the cuprates, Phys. Rev. B 98, 184501 – Published 1 November 2018
150. Gabriele La Nave, Philip Phillips, Fractional Virasoro Algebras, Adv. Theor. Math. Phys. Volume 23, Number 6, 1631–1655, 2019
149. Gabriele La Nave, Philip W. Phillips. Geodesically Complete Metrics Induce Boundary Non-locality in Holography: Consequences for the Entanglement Entropy, Phys. Rev. D 94, 126018 (2016)
148. Zhidong Leong, Philip Phillips, The effects of Coulomb interactions on the superconducting gaps in iron-based superconductors, Phys. Rev. B 93, 155159 (2016)
147. Chandan Setty, Philip W. Phillips. Study of non-Fermi Liquid behavior from partial nesting in multi-orbital superconductors. Phys. Rev. B 93, 094516 (2016)



146. Andreas Karch, Kridsanaphong Limtragool, Philip W. Phillips. Unparticles and Anomalous Dimensions in the Cuprates, JHEP, 175 (2016)
145. Garrett Vanacore, Srinidhi T. Ramamurthy, Philip W. Phillips. Evolution of Holographic Fermi Arcs from a Mott Insulator, JHEP, article 9, 2018)
144. Zhidong Leong, Philip Phillips. The effects of Coulomb interactions on the superconducting gaps in iron-based superconductors. Phys. Rev. B 93, 155159 (2016)
143. Anthony Hegg, and Philip Phillips. Strongly Coupled Fixed Point in  $\epsilon_4$  Theory. Euro. Phys. Lett. 115:2, 27005 (2016)
142. Kridsanaphong Limtragool and Philip Phillips. Power-law Optical Conductivity from Unparticles: Application to the Cuprates. Phys. Rev. B 92, 155128 (2015)
141. Philip Phillips. Beyond Particles: Unparticles in Strongly Correlated Electron Matter. Quantum Criticality in Condensed Matter: Phenomena, Materials and Ideas in Theory and Experiment, Ed. Janusz Jędrzejewski, World Scientific Press, Singapore, 133 (2015)
140. Wei-Cheng Lee, Wan Kyu Park, Hamood Z. Arham, Laura H. Green, and Philip W. Phillips. Theory of Point Contact Spectroscopy in Correlated Materials. PNAS 112, 651 (2015)
139. Brandon W. Langle, Garrett Vanacore, Philip W. Phillips. Absence of Power-Law Mid-Infrared Conductivity in Gravitational Crystals. J High Energy Phys. 2015, 163 (2015)
138. Zhidong Leong, Wei-Cheng Lee, Weicheng Lv, Philip W Phillips. High-energy damping by particle-hole excitations in the spin-wave spectrum of iron-based superconductors. Phys. Rev. B 90, 125158 (2014)
137. Kridsanaphong Limtragool, Philip W Phillips. Divergent Thermopower without a Quantum Phase Transition. Phys Rev Letters 113, 086405 (2014)
136. Garrett Vanacore, Philip W Phillips. Minding the gap in holographic models of interacting fermions. Phys. Rev. D 90, 044022 (2014)
135. Philip W. Phillips, Brandon W. Langle, and Jimmy A. Hutasoit. Un-Fermi liquids: Unparticles in strongly correlated electron matter. Phys. Rev. B 88, 115129 (2013).
134. Wei-Cheng Lee, Philip Phillips. Orbital resonance mode in superconducting iron pnictides. EPL 103, 57003 (2013).
133. Anthony Hegg, Frank Krueger, Philip Phillips. Breakdown of self-averaging in

- the Bose glass. *Physical Review B* 88,134206 (2013).
132. Seungmin Hong, Pouyan Ghaemi, J.E. Moore, Philip Phillips. Tuning thermoelectric power factor by crystal-field and spin-orbit couplings in Kondo-lattice materials. *Physical Review B (Condensed Matter and Materials Physics)*, 88, p 075118 (2013).
  131. Ka Wai Lo, Seungmin Hong, Philip W. Phillips. Non-equilibrium Transport in the Strange Metal and Pseudogap phases of the Cuprates. *Physical Review B* 88, 235114 (2013)
  130. K. B. Dave, P. Phillips, C. Kane. Absence of Luttinger's Theorem due to Zeros in the Single-particle Green Function. *Physical Review Lett.* 110, 090403 (2013).
  129. K. W. Lo, W.-C. Lee, P. Phillips. Non-fermi Liquid Behaviour at the Orbital-ordering Quantum Critical Point in the Two-orbital Model. *Europhysics Letters*, 101, 50007 (2013).
  128. Seungmin Hong; P. Phillips. Towards the standard model for Fermi arcs from a Wilsonian reduction of the Hubbard model. *Physical Review B* 86, 115118 (2012)
  127. M. Edalati, K.W. Lo, P.W. Phillips. Pomeranchuk instability in a non-Fermi liquid from holography. *Physical Review D*, 86, 086003, (2012).
  126. Wei-Cheng Lee and Philip Phillips. Non-Fermi liquid due to orbital fluctuations in iron pnictide superconductor. *Phys. Rev. B* 86, 245113 (2012).
  125. Lee Wei-Cheng, Lv Weicheng, J.M. Tranquada, P.W. Phillips. Impact of dynamic orbital correlations on magnetic excitations in the normal state of iron-based superconductors. *Physical Review B* 86, 094516, 1 Sept. 2012.
  124. P. Phillips. Normal state of the copper oxide high-temperature superconductors. *Philosophical Transactions of the Royal Society A: Mathematical, Physical and Engineering Sciences* 369 (1941): 1572-1573 (2011).
  123. Wei-Cheng Lee and Philip W. Phillips, "Spectral Weight Transfer in Mutiorbital Mott Systems," *Phys. Rev. B* 84, 115101 (2011).
  122. Frank Kruger, Seungmin Hong and Philip Phillips, "Two Distinct Mott-Insulator to Bose-glass Transitions and Breakdown of Self-averaging in the Disordered Bose-Hubbard Model," *Phys. Rev. B* 84, 115118 (2011).
  121. Wei-Cheng Lv, WC Lee, and Philip Phillips, "Vacancy-Driven orbital and Magnetic Order in  $(\text{K,Tl,Cs})_y\text{Fe}_{(2-x)}\text{Se}_2$ ," *Phys. Rev. B* 84 (15), (2011).
  120. Weicheng Lv and Philip Phillips, "Orbitally and Magnetically Induced Anisotropy in Iron-Based Superconductors," *Phys. Rev. B* 84, 174512 (2011).
  119. Arti Garg, B. Siriam Shastry, Kiaran B. Dave, and Philip W. Phillips, "Thermopower and Quantum Criticality in a Strongly Interacting System: Parallels with the Cuprates," *New J. Phys.* **13**, (2011).

118. Mohammad Edalati, Ka Wai Lo, Philip W. Phillips, "Neutral Order Parameters in Metallic Criticality in  $d=2+1$  from a Hairy Electron Star," *Phys. Rev. D* 84, 066007, (2011).
117. Jiansheng Wu, Philip Phillips, "Magnon-Mediated pairing and Isotope Effect in Iron-Based Superconductors," *Journal of Physics Condensed Matter*, v 23, n 9, 094203 (2011).
116. Mohammad Edalati, Robert G. Leigh, Philip W. Phillips, "Dynamically generated Mott gap from holography," *Physical Review Letters*, v 106, n 9, 091602 (2011).
115. Mohammad Edalati, Robert G. Leigh, Philip W. Phillips. "Dynamical Gap and Cupratelike Physics from Holography," *Physical Review D*, 83, n 4, p 046012 (14 pp.), (2011).
114. Philip Phillips, "Mottness Collapse and T-linear Resistivity in Cuprate Superconductors," *Philosophical Transactions of the Royal Society A-Mathematical Physical and Engineering Sciences* 369 p1574-1598 (2011).
113. Shiladitya Chakraborty, Seungmin Hong, and Philip Phillips, "Nonconservation of Fermionic Degrees of Freedom at Low Energy in Doped Mott Insulators," *Physical Review B* 81:23 235135 (2010).
112. Lv, Weicheng; Krueger, Frank; Phillips, Philip, "Orbital Ordering and Unfrustrated  $(\pi, 0)$  Magnetism from Degenerate Double Exchange in the Iron Pnictides," *Physical Review B* 82 (4): Art. No. 045125 (2010).
111. Shiladitya Chakraborty, Dimitrios Galanakis, and Philip Phillips, "Emergence of Particle-hole Symmetry near Optimal Doping in High-Temperature Copper Oxide Superconductors," *Physical Review B (Condensed Matter and Materials Physics)*, v 82, n 21, p 214503 (6 pp.), ( 2010).
110. Phillips, P., "Mottness: Identifying the Propagating Charge Modes in doped Mott Insulators," *Rev. Mod. Phys.* vol. 82, 1719 (2010).
109. Philip Phillips and Mark Jarrell, "Comment on "X-ray absorption spectra reveal the inapplicability of the single-band Hubbard model to overdoped cuprate superconductors,"". *Physical Review Letters*, v 105, n 19, p 199701 (1 pp.), (2010).
108. Seradjeh, B., Wu, J., and Phillips, P, "Reply to Comment on "Signatures of Surface States in Bismuth at High Magnetic Fields,"" *Phys. Rev. Lett.* 104, 059706 (2010).
107. Seradjeh, B., Wu, J.S.and Phillips, P., "Signatures of Surface States in Bismuth at High Magnetic Fields," *Phys. Rev. Lett.* 103, 136803 (2009).
106. Galanakis, D., Stanescu, T. D., and Phillips, P., "Mott transition on a triangular lattice," *Phys. Rev. B*, 79:11, 115116 (2009).

105. Leigh, R. and Phillips, P., "Origin of the Mott gap," *Phys. Rev. B*, 79:24, 245120 (2009).
104. Phillips, P., Choy, T. -P., and Leigh, R. G., "Mottness in High-Temperature Copper-Oxide Superconductors," *Rep. Prog. Phys.* 72, 036501 (2009).
103. Kruger, F., Wu, J., and Phillips, P., "Anomalous suppression of the Bose glass at commensurate filings in the disordered Bose-Hubbard model," *Phys. Rev. B*, 80:9, 094526 (2009).
102. Chakraborty, S., and Phillips, P., "Two-fluid model of the pseudogap of high-temperature cuprate superconductors based on charge-2e bosons," *Phys. Rev. B* 80:13 132505 (2009).
101. Lv, W., Wu, J., and Phillips, P., "Orbital ordering induces structural phase transition and the resistivity anomaly in iron pnictides," *Phys. Rev. B* 80:22 224506 (2009).
100. Wu, J. and Phillips, P., "Experimental detection of sign-reversal pairing in iron-based superconductors," *Phys. Rev. B*, 78:9, 092502 (2009).
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97. Choy, T.P., Leigh, R.G., and Phillips, P., "Hidden charge-2e boson: Experimental Consequences for Doped Mott Insulators," *Phys. Rev. B*. 77, 104524 (2008).
96. Papanikolaou, S., Fernandes, R.M., Fradkin, E., Phillips, P., Schmalian, J., and Sknepnek, R., "Universality of Liquid-Gas Mott Transitions at Finite Temperatures," *Phys. Rev. Lett.*, 100, 026408 (2008).
95. Choy, T.P, Leigh, R.G., Phillips, P., and Powell, P.D., "Exact Integration of the High Energy Scale in Doped Mott Insulators," *Phys. Rev. B*, 77, 14512 (2008).
94. Wu, J., and Phillips, P., "Minimal Model for Disorder-Induced missing Moment of Inertia in Solid  $^4\text{He}$ ," *Phys. Rev. B*., 78:1, 014515 (2008).
93. Leigh, R., Phillips, P., and Choy, T-P., "Hidden Charge 2e Boson in Doped Mott Insulators: Field Theory of Mottness," *Phys. Rev. Lett.*, 99, 046404 (2007).
92. Stanescu, T., Phillips, P., Choy, T-P., "Much Ado about Zeros: The Luttinger Surface and Mottness," *Phys. Rev B*, 75, 104503 (2007).
91. Phillips, P. "Mottness," *Annals of Physics* vol. 321, 1634-1650 (2006).
90. Wu, J. and Phillips, P. "Vortex Glass is a Metal: Unified Theory of the Bose Metal State," *Phys. Rev. B* 73, 214507 (2006).
89. Choy, T.P., Galanakis, D., and Phillips, P., "Squaring the triangle: Insulating State

- of  $\text{Na}_{0.5}\text{CoO}_2$ ,” *Phys. Rev. B*, vol. 75, 73103 (2007).
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### **Invited Lectures and Conference Talks since 2005**

November 2, 2023 "Superconductivity and Mottness: Exact Results", Hamilton Colloquium Series, Princeton University, Princeton

October 28, 2023 "Mottness and Superconductivity: Exact Results Non-Fermi Liquids: Recent Developments and Future Prospects", Kadanoff Center for Theoretical Physics, University of Chicago

October 9, 2023 "Superconductivity and Mottness: Exact Results", Colloquium, New York,

New York

September 18, 2023 “Beyond BCS: An Exact Model for Superconductivity and Mottness”, KITP Conference: Electron Correlations beyond the Quasiparticle Paradigm: Theory and Experiment, Kavli Institute

August 9, 2023 “ $1/4$  is the new  $1/2$ : Emergent Mottness at Quarter filling in the Haldane and KM/BHZ Models”, Principles of Quantum Matter: A Symposium to Celebrate Charles Kane’s 60th Birthday University of Pennsylvania

July 17-18, 2023 “ $1/4$  is the new  $1/2$ : Mottness and Topology”, Zaanen Fest: Stripes, Planckian Dissipation and Quantum Supremacy- Leiden University, Leiden, Netherlands

July 14, 2023 “ $1/4$  is the new  $1/2$ : Mottness and Topology in Haldane and KM/BHZ Models” Princeton Summer School on Fractionalization, Criticality, and Unconventional Quantum Materials, Princeton, New Jersey

July 13, 2023 “Quartic Fixed Point, Superconductivity and Mottness: Exact Results”, Princeton Summer School on Fractionalization, Criticality, and Unconventional Quantum Materials Princeton, New Jersey

July 5, 2023 “ $1/4$  is the New  $1/2$ : Mottness and Topology in Haldane and KM/BHZ Models”, International Conference on Strongly Correlated Electron Systems (SCES 2023) Incheon, Korea

June 26, 2023 “Superconductivity and Mottness: Exact Results”, Superstripes 2023: Quantum in Complex Matter International Conference, Ischia, Italy

December 13, 2022 “Superconductivity and Mottness: Exact Results”, Spectroscopies of Novel Superconductors (SNS) Conference 2022, Bangalore, India

December 8, 2022 “Superconductivity and Mottness: Exact Results”, Colloquium, Indian Institute of Technology (IIT) Madras, India

October 30, 2022 “Strange Metals from Mottness” RCQM Workshop on Strange Metals & Emergent Phases in Materials & Structures, Rice University, Rice University, Houston, TX

August 2022 “Superconductivity and Mottness: Exact Results”, 29th International Conference on Low Temperature Physics (LT29), Sapporo, Japan

July 2022 “Superconductivity and Mottness: Exact Results”, 13th International Conference on Materials and Mechanisms of Superconductivity & High Temperature Superconductors (M2S-2022) Vancouver, Canada

June 23, 2022 “Noether’s Second Theorem and Strange Metals”, Nordita Conference, Recent Developments in Strongly-Correlated Quantum Matter, Stockholm, Sweden

March 9, 2022 “Superconductivity and Mottness: Exact Results”, Seminar, Harvard University, Cambridge, Massachusetts

February 23, 2022 New Directions in Strong Correlation Physics: From Strange Metals to Topological Superconductivity Workshop Colloquium, University Of Illinois Urbana Champaign

January 24, 2022 "Superconductivity and Mottness: Exact Results", Workshop: New Directions in Strong Correlation Physics: From Strange Metals to Topological Superconductivity Workshop ,Aspen Center for Physics, Aspen, Colorado

December 8, 2021 "Superconductivity and Mottness: Exact Results", Seminar, John Hopkins University, Baltimore ,Maryland

November 4, 2021 "Superconductivity and Mottness: Exact Results", Seminar, Brown University, Providence, Rhode Island

October 8, 2021 "Superconductivity and Mottness: Exact Results" Colloquium, University of Florida, Tampa Florida

April 20, 2021 "Superconductivity and Mottness: Exact Results", Virtual Seminar, Ohio State University, Columbus OH

April 13, 2021 "Superconductivity and Mottness: Exact Results", Virtual Seminar Nordic Institute for Theoretical Physics, Nordita University, Stockholm Sweden

February 18, 2021 "Superconductivity and Mottness: Exact Results", Virtual Seminar: Colloquium University of Chicago, Chicago IL

February 3, 2021 "Superconductivity and Mottness: Exact Results", Virtual Seminar: Colloquium, Ohio State University, Columbus OH

January 29, 2021 "Superconductivity and Mottness: Exact Results", Virtual Seminar, Harvard University, Cambridge MA

November 6, 2020 "Moire is Different: Wigner Crystallization in TBLG/TMD Systems", Virtual Symposium: Correlated Insulating states in Two Dimensions, Institute for Theoretical Atomic Molecular and Optical Physics, Harvard University, Cambridge MA

October 29, 2020 "Does Noether's Second Theorem=Extra Dimensions For Cuprate Superconductors?", Virtual Seminar: Colloquium, University of Oregon, Eugene Oregon

October 23, 2020 "Superconductivity and Mottness: Exact Results", Virtual Seminar : Colloquium Mississippi State University, Starkville Mississippi

September 25, 2020 "Superconductivity and Mottness: Exact Results", Virtual Seminar: Colloquium, McGill Univeristy, Montreal Canada

September 4, 2020 "Superconductivity and Mottness: Exact Results", Virtual Seminar: Condensed Matter Seminar, University of Illinois Urbana Champaign

August 27, 2020 "Superconductivity and Mottness: Exact Results", Virtual Seminar, Kavali Institute for Theoretical Physics, Santa Barbara California

June 20, 2020 "Superconductivity and Mottness: Exact Results", Virtual Seminar University of Florida, Gainesville Florida

May 14, 2020 "Beyond BCS: An Exact Model for Superconductivity and Mottness", Virtual Seminar Series: Quantum Fluids in Isolation, Boston College, Boston Massachusetts

March 10, 2020 "Superconductivity and Mottness: Exact Results", International Conference: Holomatter2020, Madrid, Spain

February 18, 2020 "Noether's Second Theorem and Strange Metals", Condensed Matter Seminar, Rutgers University, New Jersey

September 13, 2019 "Anomalous Dimensions and the Strange Metal", Solid State Seminar, University of Paris-Sud, Orsay, France

September 8-13, 2019 "Moire is Different: Wigner Crystallization in TBLG", International Workshop: Recent Progress in Many-Body Theory Toulouse, France

August 19-23, 2019 "Moire is Different: Wigner Crystallization in TBLG", International Workshop: Strange and Bad Metals TD. Lee Center for Theoretical Physics, Shanghai, China

June 19, 2019 "Fractional Electromagnetism from Noether's Second Theorem", XIII. International Workshop: Lie Theory and its Applications in Physics, Institute for Nuclear Research and Nuclear Energy, Varna Bulgaria

May 31, 2019 "Fractional Electromagnetism from Noether's Second Theorem", YIPQS Workshop "Quantum Information and String Theory", Yukawa Institute for Theoretical Physics

May 15, 2019 "Moire is Different: Wigner crystallization in TBLG", Condensed Matter Seminar, University of California, San Diego, California

April 8, 2019 "Moire is Different: Wigner crystallization in TBLG", Physics & Astronomy Condensed Matter Seminar Rice University, Houston Texas

January 25, 2019 "Moire is Different: Wigner crystallization in TBLG", Seminar, Kavali Institute for Theoretical Physics (KITP), Santa Barbara, California

January 8, 2019 "Unparticles: MEELS, ARPES and the Strange Metal", Bringing Holography to the Lab: Explaining Strange Metals with Virtual Black Holes, Leiden Institute of Physics (LION), Leiden University, The Netherlands

November 30, 2018 "Anomalous dimensions for conserved currents from holographic dilatonic models to superconductivity", Condensed Matter Seminar, Stewart Blusson, Quantum Matter Institute, The University of British Columbia

November 29, 2018 "Moire is Different: Wigner Crystallization in TBLG?", String Theory Seminar, Stewart Blusson Quantum Matter Institute, The University of British Columbia

October 4, 2018 "Do Cuprates Harbor Extra Dimensions?" Physics Colloquium Washington University, St. Louis Missouri

October 3, 2018 "Moire is Different: Wigner Crystallization in TBLG", Physics Theory Seminar, Washington University, St. Louis Missouri

May 25, 2018 "Anomalous dimensions and the strange metal", Workshop: The NCTS Workshop on Correlated Quantum Many-body Systems from Topology to Quantum Criticality, Hsinchu, Taiwan

May 24, 2018 "Moire is Different: Twisted bi-layer Graphene as a Meta Material", Colloquium: NCTS, Taiwan

May 14, 2018 "Anomalous Dimensions for conserved currents from holographic dilatonic models to superconductivity", Workshop: Multi-Condensate Superconductivity and Superfluidity in Solids and Ultracold Gases Conference, Trieste, Italy

May 8, 2018 "Anomalous dimensions for conserved currents from holographic dilatonic models to superconductivity", String Seminar, University of California, Berkley

April 25, 2018 "Moire is Different Bi-Layer graphene as a meta-material", Workshop: 2D Quantum MetaMaterials Workshop, NIST, Gaithersburg, Maryland

April 16, 2018 "Anomalous dimensions for conserved currents and Noether's Second Theorem ", Seminar: Princeton University, Princeton, New Jersey

April 6, 2018 "Anomalous dimensions for conserved currents and Noether's Second Theorem ", Seminar: Indiana University, Bloomington, Indiana

February 12, 2018 "Anomalous dimensions for conserved currents and Noether's Second Theorem ", Seminar: Institute of Condensed Matter Physics, University of Illinois at Urbana Champaign

November 23, 2017 "Anomalous dimensions for conserved currents and Noether's Second Theorem ", Seminar: University of Paris, Jussieu, France

October 25, 2017 " Do Cuprate High-Temperature Superconductors Harbor Extra Dimensions?", Seminar: University of California, Berkeley, California

October 12, 2017 "Do Cuprate High-Temperature Superconductors Harbor Extra Dimensions?", Colloquium: University of Toronto, Ontario, Canada

August 11, 2017 "How to detect an anomalous dimension of the current in the Strange Metal of the Cuprates?", Workshop: 28th International Conference on Low Temperature Physics,, Gothenburg, Sweden

June 12, 2017 "Fractional Laplacians and Anomalous Dimensions in the AdS/CFT" Workshop: Ninth Crete Regional Meeting in String Theory, Orthodox Academy of Crete, Chania-Crete Greece

June 14, 2017 "Are Extra Dimensions Hidden in the Strange Metal?", Colloquium: National University of Singapore, Singapore

June 8, 2017, "Bose metals as a disruption of the KT transition in thin films" Workshop: Workshop on Topological Phase Transitions and New Developments, Nanyang Technological University, Singapore

March, 3, 2017 "Virasoro Algebra for the Strange Metal" Workshop: Common Threads in the Electronic Phase Diagram of Unconventional Superconductors, Lorentz Center, University of Leiden, Netherlands

February 1, 2017 "Do Cuprate High-Temperature Superconductors Have Extra Dimensions?" Colloquium: Emory College of Arts and Sciences, Atlanta, Georgia

January 13, 2017, "Anomalous Dimensions, Mottness, Bose metals, and holography" Workshop: Disorder in Condensed Matter and Black Holes Workshop at Lorentz Center, University of Leiden, Netherlands

December 19, 2016 "Do Cuprate High-Temperature Superconductors have Extra Dimensions?", Seminar: Jia Tong University, Shanghai, China

December 16, 2016 "Detecting the Pairing Symmetry in  $\text{PrOs}_4\text{Sb}_{12}$ ", Seminar: Jia Tong University, Shanghai, China

November 10, 2016 "Anti-Local Boundary Actions and Anomalous Dimensions in the Gauge-Gravity Duality: Application to the Strange Metal" Seminar: Kavli Institute for Theoretical Physics, University of California, Santa Barbara, California

October 12, 2016 "Anti (Non)-Local Actions and Anomalous Dimensions: Application to the Strange Metal", Seminar: Brown University, Providence Rhode Island

September 9, 2016 "Do Cuprate High-Temperature Superconductors have Extra Dimensions?", Seminar: Argonne National Laboratory, Argonne, Illinois

August 4, 2016 "Does Copper have Extra Dimensions?", Public Lecture at the Aspen Center for Physics, Aspen, Colorado

July 14 2016 "Anti (Non)-Local Actions and Anomalous Dimensions: Application to the Strange Metal", Seminar: Imperial College, London, England

July 14, 2016 "Non-Equilibrium Physics and Holography "Anti (Non)-Local Actions and Anomalous Dimensions: Application to the Strange Metal?"", Seminar: St. Johns College, Oxford University, England

June 25, 2016 "Detecting Unparticles and Anomalous Dimensions in the Strange Metal?" Invited Lecture: Superstripes 2016: Quantum In Complex Matter, Ischia, Italy

Jun 13, 2016 "Detecting Unparticles and Anomalous Dimensions in the Strange Metal" Invited Talk: Quantum Matter, Spacetime and Information, Kyoto, Japan

June 7, 2016 "Branes, in the AdS/CFT Correspondance", Invited Talk: Quantum Matter,

Spacetime and Information Kyoto, Japan

April 8, 2016 “Testing Mottness/unparticles and anomalous dimensions in the cuprates”  
Invited Talk: ICTP/SAIFER, Sao Paulo, Brazil

March 23, 2016 “Testing Mottness/unparticles and anomalous dimensions in the cuprates”  
Seminar: City College of New York, New York, New York

March 12, 2016 “ Is Holography about Fractional Conformal Laplacians?” Seminar:  
University of British Columbia, Vancouver, Canada

March 11, 2016 “ Testing Mottness/unparticles and anomalous dimensions in the cuprates”  
Seminar: University of British Columbia, Vancouver, Canada

January 12, 2016 “Optical Conductivity in Cuprates from Holography and Unparticles”  
Seminar: University of Washington, Seattle, Washington

December 3, 2015 “Fractionalization or Surface States in Bismuth?” Invited Talk: ISANN  
2015, Waikola, Hawaii

October 30, 2015 “Optical Conductivity in Cuprates from Holography and Unparticles”  
Seminar: Boston University, Boston, Massachusetts

October 29, 2015 “Are the Cuprate High Temperature Superconductors full of Unparticles?,”  
Colloquium: New York University, New York, New York

October 9, 2015 “Optical Conductivity in Cuprates from Holography and Unparticles,  
Seminar: UIUC Condensed Matter, Urbana, Illinois

August 13, 2015 “Holography and Mottness”, Public Lecture for Undergrad Students:  
International Conference of Physics, Students, Zagreb, Croatia

July 2, 2015 “Optical Conductivity in Cuprates from Holography and Unparticles” Invited  
Talk: International Workshop on, Amsterdam, Netherlands

June 30, 2015 “Optical Conductivity in Cuprates from Holography and Unparticles” Invited  
talk: International Conference on Mott Quantum Criticality, Mainz, Germany

June 7, 2015 “Spin or orbital-based Physics in the Fe-based Superconductors?” Invited talk:  
Workshop on Unconventional Phenomena in Low-Dimensional Correlated systems, Beijing  
China

June 5, 2015 “Optical Conductivity in the Cuprates: From Mottness to Scale Invariance”  
Seminar, Kavli Institute of Physics, Beijing, China

June 4, 2015 “Counting Charges: Mott gaps and Fermi Arcs from Holography” Seminar,  
Beijing, China

June 2, 2015 “Spin or orbital-based Physics in the Fe-based Superconductors?” Seminar,  
Shanghai, China



May 22, 2015 “Optical Conductivity in the Cuprates: From Mottness to Scale Invariance  
Invited talk: International Workshop on Condensed Matter Physics and Ads/SFT, Kavli IPMU  
Tokyo Japan

April 30, 2015 “Counting Charges: Mott gaps and Fermi Arcs form Holography”, Seminar,  
Rutgers University, University of Colorado, Boulder

March 24, 2015 “University of Mississippi?” Seminar, Rutgers University, New Brunswick,  
New Jersey

February 22, 2015 “Unparticles When Electrons Interact?” Colloquium, University of  
Mississippi

February 20, 2014 “ Strongly Coupled fixed point in  $g\tilde{A}\bullet \hat{=}$  4 theory, Invited talk: Winter  
Conference – Particle Physics, Aspen Center for Physics

November 24, 2014, Invited talk: "Mott gaps, unparticles and Fermi Arcs", Condensed  
Matter, UC Berkeley

September 5, 2014 “Mott gaps, unparticles and Fermi Arcs”, Quantum Field Theory, String  
Theory and Condensed Matter Physics, Crete, Greece

August 12, 2014 “Mottness and Holography” 27th International Conference on Low  
Temperature Physics, Buenos Aires, Argentina

June 22, 2014 "Are the Cuprates and LiFeAs full of Unparticles?" Invited talk: Conference on  
Itinerant Magnetism and Superconductivity, Dresden, Germany

June 9, 2014 "Spin or Orbital-based Physics in the Fe-based Superconductors?" Invited talk:  
Conference on Energy Materials Nanotechnology, Cancun, Mexico

April 17, 2014 “Unparticles, Zeros and Ads” Invited talk: Conference on Non-Fermi Liquids  
Stanford University, Stanford, California

March 2014 “Mottness: Beyond Particles” Seminar, National University of Singapore

March 2014 “Gravity and Electron Matter” Seminar, National University of Singapore

March 7, 2014 “Gravity and Electron Matter” Invited talk: Public/Student Lecture, 50th  
Karpacz Winter School of Theoretical Physics Uniwersytet Wroclawski, Karpacz, Poland

March 7, 2014 “Unparticles = Mottness” Invited talk: 50th Karpacz Winter School of  
Theoretical Physics Uniwersytet Wroclawski, Karpacz, Poland

January 27, 2014 “Unparticles and Superconductivity” Colloquium University of Tennessee,  
Knoxville, Tennessee

November 25, 2013 “Unparticles and Superconductivity” Invited talk: NIHERST Public  
Lecture The University of the West Indies, St. Augustine, Trinidad

October 23, 2013 “Unparticles in High  $T_c$  Superconductors” Colloquium talk: The Joseph and

Sophia Konopinski Colloquium Series University of Indiana, Bloomington, IN

September 12, 2013 “Failure of Luttinger's Theorem: Emergence of Unparticles” Invited Talk, Many-Body Theory Conference Rostock, Germany

June 2013 “Unparticles and Mottness” Seminar, Brookhaven National Lab

May 2013 “Unparticles and Emergent Mottness” Plenary Lecture, Great Lake Strings Conference Lexington, KY

May 2013 “Unparticles and Un-Fermi Liquids” Colloquium, University of California, Irvine, CA

April 2013 “Unparticles and Emergent Mottness” Plenary Lecture, Workshop on Frontiers of Quantum Matter, Rio de Janeiro, Brazil

March 20, 2013 “Absence of Luttinger's Theorem” American Physical Society March Meeting, Baltimore Maryland

February 11, 2013 “Unparticles in Strongly Correlated Electron Matter” Colloquium, Department of Physics, Harvard University

January 17, 2013 “Strongly Correlated Electron Matter and Unparticles” Colloquium, Department of Physics, Case Western Reserve University, Cleveland, OH

November 16, 2012 “Is Strongly Correlated Electron Matter Full of Unparticles?” Colloquium, Department of Physics, St. Andrews University, Scotland

October 29, 2012 “Is Strongly Correlated Electron Matter Full of Unparticles?” Physics Department Colloquium, University of North Carolina, Chapel Hill

September 28, 2012 “Is Strongly Correlated Electron Matter Full of Unparticles?” E. E. Just Program, Dartmouth College, Hanover, NH

September 3, 2012 “Holography and Mottness: a Discrete Marriage” Physics Department Colloquium, University of Illinois, Urbana, IL

August 1, 2012 “Mottness and Holography: A Discrete Marriage” Invited Talk, Materials & Mechanisms of Superconductivity Conference (M2S 2012), Washington, DC

July 12, 2012 “From Multi-orbital physics to Holography in Fe-based Superconductors” Superstripes 2012, Erice, Italy

April 30, 2012 “From Fermi Arcs to Holography” Invited Talk, International Conference on Superconductivity and Magnetism (ICSM), Istanbul, Turkey.

March 2012, “Holography and Mottness: A Discrete Marriage,” APS March Meeting, Boston, MA.

December 2011, “Holography and Mottness: A Discrete Marriage,” Physics Department Colloquium, Emory University, Atlanta, GA.

November 2011, “Holography and Mottness: A Discrete Marriage,” KITP, Workshop on AIS/CMT, University of California, Santa Barbara, CA.

October 2011, “Holography and Mottness: A Discrete Marriage,” Physics Department Colloquium, Florida State University, Tallahassee, FL.

September 2011, “Mottness and Metallic Quantum Criticality from Holography,” Joint Condensed Matter/ICMT Seminar, Department of Physics, University of Illinois.

August 2011, “Mottness and Holography,” The 26<sup>th</sup> International Conference on Low Temperature Physics (LT26) Beijing, China.

July 2011, “Mottness and Holography: Strange Metal to Fermi Arcs,” 8<sup>th</sup> International Conference on Stripes and High  $T_c$  Superconductivity, STRIPES11, Sapienze University of Rome, Italy.

May 2011, “Mottness and Holography: Strange Metal from UV-IR Mixing,” Physics Department Colloquium, Stanford University, Stanford, CA.

April 2011, “Gauge-Gravity Duality and High-Temperature Superconductivity,” 100 Years of Superconductivity Conference, Leiden.

March 2011, “Spectral Weight Transfer in a Multi-Orbital Mott System,” March APS Meeting, Dallas, TX.

January 2011, “Mottness and Holography: Strange Metal from UV-IR Mixing,” Physics Colloquium, Caltech.

November 2010, “Orbital Ordering in Iron Pnictides,” Conference for Emergent Superconductivity (CES), Stony Brook University, NY.

October 2010, “From the Vulcanization of Rubber, to Quarks and High-Temperature Superconductivity: Physics at Strong Coupling,” Public Lecture, Haverford College, Haverford, PA.

September 2010, “Demystifying the Strange Metal in Cuprate Superconductors: Composite Excitations,” Solid State Seminar, Univ. of Sherbrooke, Quebec, Canada.

June 2010, “Dynamical Spectral Weight Transfer and Anomalous Transport in the Cuprates,” Strongly Correlated Electron Systems, Santa Fe, NM.

June 2010, “Demystifying the Strange Metal in Cuprate Superconductors: Composite Excitations,” Gordon Research Conference, Mount Holyoke College, South Hadley, MA.

May 2010, “Dynamically Generated Gaps in Condensed Matter from Holography,” Galileo Galilei Inst. for Theoretical Physics, Florence, Italy.

May 2010, “Demystifying the Strange Metal: Composite Excitations,” Chicago-Urbana Fest, University of Chicago, Chicago, IL.

April 2010, “Arsenic and Old Lace: A tale of two electrons in iron-based superconductors,” ICMT Seminar, University of Illinois, Urbana, IL.

March 2010, “Signatures of Surface States in Bismuth at High Magnetic Field,” APS March Meeting, Portland, OR.

January 2010, "From the Vulcanization of Rubber to Quarks and High-Temperature Superconductivity: Physics at Strong Coupling," Public Lecture at Exotic Insulator Conference, Johns Hopkins University.

December 2009, "Demystifying the Strange Metal in Cuprate Superconductors: Composite Excitations," Colloquium, University of Illinois, Urbana, IL.

November 2009, "Iron and Old Lace: Superconductivity in Iron Pnictides," Seminar, Indiana University, Bloomington, IN.

October 2009, "Hidden Charge  $2e$  Boson in Doped Mott Insulators: Theory of the Normal State of the Cuprate Superconductors," Colloquium, Dalhousie University, Dalhousie, Canada.

September 2009, "Hidden Charge  $2e$  Boson in Doped Mott Insulators: Theory of the Normal State of the Cuprate Superconductors, M2S Meeting, Tokyo, Japan.

June 2009, "Mottness and Strong Coupling: Hidden Charge  $2e$  boson," KITP Conference on Physics of Higher Temperature Superconductors, University of California, Santa Barbara

June, 2008, "Hidden Charge  $2e$  Boson in High  $T_c$ : Field Theory of Mottness," Intl. Seminar and Workshop on Unconventional Phases and Phase Transitions in Strongly Correlated Electron Systems, Max-Planck-Inst. Dresden, Germany.

May, 2008, "Hidden Charge  $2e$  Boson in High  $T_c$ : Field Theory of Mottness," University of Illinois at Urbana-Champaign, Urbana, IL.

March, 2008, "Mottness and Strong Coupling," High-Energy Theoretical Physics Seminar, University of Illinois at Urbana-Champaign, Urbana, IL.

February 2008, "Hidden Charge  $2e$  Boson in High  $T_c$ : Field Theory of Mottness," Colloquium, Department of Physics, Indiana University

February 2008, "Hidden Charge  $2e$  Boson in High  $T_c$ : Field Theory of Mottness," Physics Division, Argonne National Laboratory, IL.

January 2008, "Hidden Charge  $2e$  Boson in High  $T_c$ : Field Theory of Mottness," Department of Physics, University of Toronto, Toronto, Canada.

January 2008, "Hidden Charge  $2e$  Boson in High  $T_c$ : Field Theory of Mottness," Colloquium, Department of Physics, University of Waterloo, Waterloo, Canada.

December 2007, "Hidden Charge  $2e$  Boson in High  $T_c$ : Field Theory of Mottness," Department of Physics, UCSD, San Diego, CA.

November 2007, "Dynamical Spectral Weight Transfer," KITP Workshop on Mott Materials.

November 2007, "Hidden Charge  $2e$  Boson in High  $T_c$ : Field Theory of Mottness," KITP Workshop on Mott Materials.

October 2007, "Hidden Charge  $2e$  Boson in High  $T_c$ : Field Theory of Mottness," Colloquium, Department of Physics, Washington University, St. Louis, MO.

July, 2007, "Exact Integration of the High-Energy Scale in Doped Mott Insulators,"  
Workshop on Unconventional Superconductors, Aspen Center for Physics.

June 2007, "Hidden Charge 2e boson in doped Mott insulators: Field theory of Mottness,"  
Department of Physics, Theory Division, Oak Ridge Natational Lab, TN.

May 2007, "Hidden Charge 2e boson in doped Mott insulators: Field theory of Mottness,"  
Department of Physics, MIT.

May 2007, "Hidden Charge 2e boson in doped Mott insulators: Field theory of Mottness,"  
Department of Physics, Boston Univ., MA.

March 2007, "Supersolidity is Dirty," Department of Physics Colloquium, New York  
University, NY.

March, 2007, "Hidden Charge 2e boson in doped Mott insulators: Field theory of Mottness,"  
Department of Physics, Columbia Univ., NY.

February, 2007, "Hidden Charge 2e boson in doped Mott insulators: Field theory of  
Mottness," Department of Physics, University of Illinois at Urbana-Champaign.

December, 2006, "Supersolidity is Dirty," Colloquium, Los Alamos National Laboratory.

October, 2006, "Squaring the triangle: Insulating state of  $\text{Na}_{0.5}\text{CoO}_2$ ," 5<sup>th</sup> Workshop on  
Orbital Physics and Novel Phenomena in Transition Metal Oxides, Berlin Germany.

August, 2006, "Much Ado about Zeros: Mottness in the Cuprates," Novel States of  
Unstable and Stable Quantum Matter, ICTP, Trieste, Italy.

July 2006, "Squaring the Triangle: Insulating state of  $\text{Na}_{0.5}\text{CoO}_2$ ," First International  
Workshop on Physical Properties of Lamellar Cobaltates, Paris, France.

July 2006, "Much Ado about Zeros: Mottness in the Cuprates," Conference on Solid  
Compounds of Transition Elements, Cracow, Poland.

July 2006, "Much Ado about Zeros: Mottness in the Cuprates," The 10th Franco  
American Transition Metal Oxides Workshop, Caen, France.

April 2006, "Much Ado about Zeros: Mottness in the Cuprates," Department of Physics,  
Univ. of Texas, Austin, TX.

April 2006, "Much Ado about Zeros: Mottness in the Cuprates," Departmental  
Colloquium, Texas A&M University, College Station, TX.

December, 2005, "The Elusive Bose Metal," Departmental Colloquium, Univ. of New  
Mexico, Albuquerque, NM.

September, 2005, "Squaring the triangle: Insulating state of  $\text{Na}_{0.5}\text{CoO}_2$ ," Department  
of Physics, UIUC.

August, 2005, "Squaring the triangle: Insulating state of  $\text{Na}_{0.5}\text{CoO}_2$ ," Workshop on  
Complexity in Strongly Correlated Electronic Systems, Leiden, Holland.

June, 2005, “Asymptotic slavery and transport anomalies in the cuprates,” International Conference on Mottness and Quantum Criticality, Tobago.

May, 2005, “The Elusive Bose Metal,” Department of Physics (Colloq.), Boston College.

March, 2005, “The Elusive Bose Metal,” Invited talk at the APS March Meeting, Los Angeles, CA.

February, 2005, “The Full Mottness,” AAS Symposium on Mottness and the Riddle of high  $T_c$ .

January, 2005, “Breakdown of One-Parameter Scaling in Quantum Critical Scenarios for the high temperature superconductors,” Aspen Winter Conference on Strongly Correlated Electrons, (talk given by collaborator, C. Chamon)