

Xiaomeng Liu

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Education:

Ph.D., Harvard University (Physics) 2019 Adviser: Philip Kim
Thesis: "[Correlated Electron States in Coupled Graphene Double-layer Heterostructures](#)"

M.S., Columbia University (Applied Physics) 2013

B.S., Peking University (Physics) 2012

Honors:

PCCM postdoctoral fellowship, Princeton University (2019)

Publications:

†Corresponding author; *equal contribution

1. **X. Liu**^{*}, J.I.A Li^{*}, K. Watanabe, T. Taniguchi, J. Hone, B. I. Halperin, C. R. Dean & P. Kim. "Crossover between strongly-coupled and weakly-coupled exciton superfluids." *in preparation*.
2. **X. Liu**^{*}, J.I.A Li^{*}, K. Watanabe, T. Taniguchi, C. R. Dean & P. Kim. "Exciton insulator in electron-hole graphene double-layer." *in preparation*.
3. **X. Liu**. et al., "Exciton condensation and Coulomb drag in graphene double-layer heterostructures." invited review, *Front. Phys. in preparation*.
4. **X. Liu**^{*†}, Z. Hao^{*}, E. Khalaf, J. Y. Lee, K. Watanabe, T. Taniguchi, A. Vishwanath, P. Kim[†]. "[Spin-polarized correlated insulator and superconductor in twisted double bilayer graphene.](#)" *arXiv:1903.08130* (2019).
5. Y. Xie, B. Lian, B. Jack, **X. Liu**, C. Chiu, K. Watanabe, T. Taniguchi, B.A. Bernevig, A. Yazdani. "Spectroscopic signatures of many-body correlations in magic-angle twisted bilayer graphene." *Nature* 572, 101–105 (2019).
6. J. Y. Lee, E. Khalaf, S. Liu, **X. Liu**, Z. Hao, P. Kim, A. Vishwanath. "Theory of correlated insulating behaviour and spin-triplet superconductivity in twisted double bilayer graphene." *arXiv:1903.08685* (2019).
7. **X. Liu**, Z. Hao, K. Watanabe, T. Taniguchi, B. Halperin, P. Kim. "[Interlayer fractional quantum Hall effect in a coupled graphene double-layer.](#)" *Nature Physics* (2019).
8. B. Jiang, G. Ni, Z. Addison, J. Shi, **X. Liu**, S. Zhao, P. Kim, E. Mele, D. Basov & M. Fogler. "Plasmon reflections by topological electronic boundaries in bilayer graphene." *Nano letters* 17 (11), 7080-7085 (2017).

9. **X. Liu**, K. Watanabe, T. Taniguchi, B. I. Halperin & P. Kim. "[Quantum Hall Drag of Exciton Superfluid in Graphene.](#)" *Nature Physics* 13, 746-750 (2017).
10. **X. Liu**, L. Wang, K. C. Fong, Y. Gao, P. Maher, K. Watanabe, T. Taniguchi, J. Hone, C. R. Dean & Kim, P. "[Frictional magneto-Coulomb drag in graphene double-layer heterostructures.](#)" *Physical Review Letters*, 119, 056802 (2017).
11. J. Crossno, J. K. Shi, K. Wang, **X. Liu**, A. Harzheim, A. Lucas, S. Sachdev, P. Kim, T. Taniguchi, K. Watanabe, T. A. Ohki & K. C. Fong. "Observation of the Dirac fluid and the breakdown of the Wiedemann-Franz law in graphene." *Science* 351, 1058–1061 (2016).
12. Y. Shimazaki, T. Yoshizawa, I. V. Borzenets, K. Wang, **X. Liu**, K. Watanabe, T. Taniguchi, P. Kim, M. Yamamoto & S. Tarucha. "Landau level evolution driven by band hybridization in mirror symmetry broken ABA-stacked trilayer graphene." *arXiv: 1611.02395* (2016).
13. J. Crossno, **X. Liu**, T. A. Ohki, P. Kim & K. C. Fong. "Development of high frequency and wide bandwidth Johnson noise thermometry." *Appl. Phys. Lett.* 106, 23121 (2015).

Presentations:

Invited: "Emergent phenomena in graphene double-layers: from exciton condensation to interlayer fractional quantum Hall effect." EPQHS7, Jun 2019

"Spin-polarized correlated insulator and superconductor in twisted double bilayer graphene" APS March Meeting, March 2019

KITP Workshop: Correlations in Moire Flat Bands, Jan 2019

"Observation of interlayer anyon pairing through fractional quantum Hall drag" 23rd International Conference on High Magnetic Fields in Semiconductor Physics, June 2018

"BEC-BCS crossover of exciton condensation in graphene double-layer" GRC on Two Dimensional Electronics Beyond Graphene, June 2018

"BEC-BCS crossover of exciton condensation in graphene double-layer" APS March Meeting, March 2018

"Quantum Hall drag of exciton condensation in bilayer graphene double layer" APS March Meeting, March 2017

"Exciton superfluidity in graphene double layers" BACON+ Meeting, Sep 2016

"Coulomb drag and exciton condensation in graphene quantum hall double layers" 33rd International Conference on the Physics of Semiconductors, Aug 2016

"Anomalous Coulomb drag in bilayer graphene double layers" APS March Meeting, March 2016

"Anomalous Coulomb drag in bilayer graphene double layers" Big Ideas in Quantum Material, Dec 2015

"Coulomb drag in graphene quantum Hall bilayer systems" APS March Meeting, March 2015

"Magneto and Hall drag in graphene double-layer" APS March Meeting, March 2014

Expertise:

Graphene 2D heterostructure stacking Cryogenics (VTI, He3 and dilution-refrigerator)

Nano-fabrication Quantum Hall effect Low-noise electrical measurements

Condensed Matter Physics Matlab Electronics

Scanning tunneling microscope (STM) Atomic force microscope (AFM)

Skills:

Machining (CNC Mill, Lathe, laser cutter) 2D&3D modelling (AutoCAD, Fusion360, Solidworks)

C Web designing (html, css, bootstrap, Wordpress) Circuits design (EAGLE CAD)

Embedded system and programming (AVR microcontroller, AVR-C) Illustrator &Photoshop