Ming-Tso Wei

Contact Information

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Professional Experience

University of Maryland, Joint Quantum Institute — Sept. 2018 – present
Postdoctoral Researcher — *College Park, MD, USA*
Supervisor: Prof. James Williams

Scientific Highlights
Discover time-reversal symmetry broken superconductivity emerging in SnTe nanowire Josephson junctions, studying Josephson effect in 2D ferromagnet Fe_3GeTe_2, and developing shot noise/cross-correlation measurement setups at radio frequencies for probing quasiparticle statistics and correlations near the interface between superconductors and topological edge states.

Duke University, Department of Physics — Aug. 2013 – Aug. 2018
PhD Student, Teaching & Research Assistant — *Durham, NC, USA*
Advisor: Prof. Gleb Finkelstein
Dissertation Title: *Transport Mechanisms of Quantum Hall Supercurrents in Graphene Josephson Junctions*

Scientific Highlights
Fabricated and measured hexagonal boron-nitride encapsulated graphene Josephson junctions (GJJs) to systematically study the transport mechanisms of quantum Hall (QH) supercurrents through several a variety of approaches, such as manipulation of QH supercurrents via injection of a normal current, or gated vacuum edges. Discovered the enhanced conductance via tunneling of chiral Andreev edge states in a short restricted channel. Other notable work includes ballistic GJJs in short and long junction regimes, and anomalous magnetic diffraction patterns near Dirac points and coexistence of supercurrents and dissipative currents in multiterminal GJJs.

Qualcomm Panel Manufacturing Ltd. — Feb. 2012 – Nov. 2012
Engineer — *Taoyuan, Taiwan*
– Designed a testing board with FPGA for a new generation of Mirasol display.
– Tested and troubleshot controller boards of Mirasol displays.
– Managed and maintained laboratory instruments.

AU Optronics — Jul. 2010 – Aug. 2010
Intern — *Hsinchu, Taiwan*
– Conducted experimental research on doping gold nanoparticles to plasmonically enhance illumination efficiency of organic light emitting diode (OLED) displays.

Education

Duke University — Aug. 2013 – Sept. 2018
Ph.D. in Physics
M.S. in Electrical and Computer Engineering (ECE)
Certificate in Nanoscience

National Chiao Tung University — Sept. 2006 – June 2010
B.S. in Electrical Engineering and Computer Science Honors Program

Publications

11 publications and 79 citations on the date of Sept. 9th, 2020, more details on my Google Scholar profile.

11. T.F.Q. Larson, L. Zhao, E.G. Arnault, **M. T. Wei**, A. Seredinski, H. Li, K. Watanabe, T. Taniguchi, F. Amet, and G. Finkelstein, Zero-bias crossings and peculiar Shapiro maps in graphene Josephson junctions, preprint on arXiv: 2003.08369 (2020), submitting to *Nano Lett.*.
10. C. J. Trimble†, **M. T. Wei**†, N. F. Q. Yuan, S. S. Kalantre, P. Liu, J. J. Cha, L. Fu, and J. R. Williams. Josephson Detection of Time Reversal Symmetry Breaking Broken Superconductivity in SnTe Nanowires, submitted to *Nature Phys.*, preprint on arXiv:1907.04199 (2019).
9. S.S. Kalantre†, F. Yu†, **M. T. Wei**, K. Watanabe, T. Taniguchi, M. Hernandez-Rivera, F. Amet, and J.R. Williams, Anomalous Phase Dynamics of Driven Graphene Josephson Junctions, *Phys. Rev. Res.* **2**, 023093 (2020).
8. C. T. Ke†, A. W. Draelos†, A. Seredinski†, **M. T. Wei**, H. Li, M. Hernandez-Rivera, K. Watanabe, T. Taniguchi, M. Yamamoto, S. Tarucha, Y. Bomze, I. V. Borzenets, F. Amet, and G. Finkelstein. Anomalous Periodicity of Magnetic Interference Patterns in Encapsulated Graphene Josephson Junctions, *Phys. Rev. Res.*, **1**, 033084 (2019).
7. A. Seredinski, A.W. Draelos, E.G. Arnault, **M.-T. Wei**, H. Li, K. Watanabe, T. Taniguchi, F. Amet, and G. Finkelstein. Quantum Hall-based Superconducting Interference Device, *Sci. Adv.*, **5**, eaaw8693 (2019).
6. **M. T. Wei**, A. W. Draelos, A. Seredinski, C. T. Ke, H. Li, Y. Mehta, K. Watanabe, T. Taniguchi, M. Yamamoto, S. Tarucha, G. Finkelstein, F. Amet, and I. V. Borzenets. Chiral Quasiparticle Tunneling Between Quantum Hall Edges in Proximity with a Superconductor, *Phys. Rev. B* **100**, 121403(R) (2019).
5. A. W. Draelos, A. Silverman, B. Eniwaye, E. G. Arnault, C. T. Ke, **M. T. Wei**, I. Vlassiouk, I. V. Borzenets, F. Amet, and G. Finkelstein. Subkelvin Lateral Thermal Transport in Diffusive Graphene, *Phys. Rev. B* **99**, 125427 (2019).
4. A. W. Draelos, **M.-T. Wei**, A. Seredinski, H. Li, Y. Mehta, K. Watanabe, T. Taniguchi, I. V. Borzenets, F. Amet, and G. Finkelstein. Supercurrent Flow in Multiterminal Graphene Josephson Junctions, *Nano Lett.* **19**, 1039 (2019).
3. A. W. Draelos†, **M. T. Wei**†, A. Seredinski, C. T. Ke, Y. Mehta, R. Chamberlain, K. Watanabe, T. Taniguchi, M. Yamamoto, S. Tarucha, I. V. Borzenets, F. Amet, and G. Finkelstein. Investigation of Supercurrent in the Quantum Hall Regime in Graphene Josephson Junctions, *J. Low Temp. Phys.* **191**, 288 (2018).
2. A. Seredinski, A. W. Draelos, **M. T. Wei**, C. T. Ke, T. Fleming, Y. Mehta, E. Mancil, H. Li, T. Taniguchi, K. Watanabe, S. Tarucha, M. Yamamoto, I. V. Borzenets, F. Amet, and G. Finkelstein. Supercurrent in Graphene Josephson Junctions with Narrow Trenches in the Quantum Hall Regime, *MRS Adv.* **3**, 2855 (2018).
1. I. V. Borzenets, F. Amet, C. T. Ke, A. W. Draelos, **M. T. Wei**, A. Seredinski, K. Watanabe, T. Taniguchi, Y. Bomze, M. Yamamoto, S. Tarucha, and G. Finkelstein. Ballistic Graphene Josephson Junctions from the Short to the Long Junction Regimes, *Phys. Rev. Lett.* **117**, 237002 (2016).

Conference Talks

Josephson Junctions in Graphene Constrictions in the Quantum Hall Regime, APS March Meeting, Los Angeles, CA, USA. (March 2018)

Ballistic Graphene Josephson Junctions from the Short to the Long Junction Regimes: Part II-Critical current scaling of the Short and Long Junctions, APS March Meeting, New Orleans, LA, USA. (March 2017)

Supercurrent in the quantum Hall regime, Poster, APS March Meeting, Baltimore, MD, USA (March 2016)

Other Talks

Transport Mechanisms of Quantum Hall Supercurrents, QuTech, Delft University of Technology, Delft, Netherlands. (February 2018)

Transport Mechanisms of Quantum Hall Supercurrents, Special Seminar, Joint Quantum Institute, University of Maryland, College Park, Maryland, USA. (January 2018)

Honors and Awards

2013–2015	Townes-Perkin-Elmer Fellowship *Department of Physics, Duke University*
Fall 2014	GPNano Fellowship *Graduate Certificate Program in Nanoscience, Duke University*
2014	Outstanding Teaching Assistant Award *American Association of Physics Teachers, USA*
Fall 2009	Study Abroad Scholarship, EECS Undergraduate Honors Program *National Chiao Tung University, Taiwan*
2009	College Student Research Training Fellowship *National Science Council, Taiwan*