

Yen-Hsiang Lin

Department of Physics
National Tsinghua University
101, Sec. 2, Kuang-Fu Road,
Hsinchu, 30013, Taiwan

Phone:03-574-2954-
yenhsiangler@gmail.com
yhlin@phys.nthu.edu.tw

EDUCATION

- 2011 Ph.D., Physics, University of Minnesota.
(Thesis Title: Electrical Transport Properties of Ultrathin Amorphous Bismuth Films Near the Superconductor-Insulator Transition. Thesis Advisor: Allen Goldman)
- 2003 B.S., Physics, National Taiwan University.

RESEARCH AND WORK EXPERIENCE

- 2020~Present Assistant Professor, Department of Physics, National TsingHua University, Taiwan
- 2014~2019 Postdoctoral Researcher, Department of Physics, University of Maryland.
- 2011~2014 Postdoctoral Researcher, Department of Physics, University of Michigan.
(Project: Invitation of Scanning Thermoelectric Microscopy)
- 2007~2011 Research Assistant, Department of Physics, University of Minnesota.
(Project: 'Tuning SI Transition by Using Magnetic Field and Electrostatic Field Effect')
- 2005~2007 Teaching Assistant, Department of Physics, University of Minnesota.
- 2002~2003 Research Assistant, Department of Physics, National Taiwan University.
(Project: 'Properties of New Nitride Thin Film')

AWARDS AND SCHOLARSHIPS

- 2019 YuShan Young Scholarship
- 2007 Outstanding TA Award
- 2006 Franklin Research Fellowship
- 2003 Student Service Education Award
- 2000 Presidential Award (top 5% of the class)

INTERESTS OF RESEARCH

Transport and RF properties of low dimensional superconducting systems
Nano-scale electronic and thermoelectric semiconductor materials
Quantum information and superconducting circuit-QED

PUBLICATIONS

1. “Fluorescence readout of a superconducting qubit using a fluxonium artificial atom” **Yen-Hsiang Lin**, Nathanael Cottet, Long Nguyen, Ray Mencia, Haonan Xiong, Vladimir Manucharyan.(in prep.)
2. “Quantum dynamics of quasicharge in an ultrahigh-impedance superconducting circuit” IV Pechenezhskiy, RA Mencia, LB Nguyen, **Yen-Hsiang Lin**, VE Manucharyan (arXiv 1907.02937)
3. “The high-coherence fluxonium qubit” BaoLong Nguyen, **Yen-Hsiang Lin**, Aaron Somoroff, Raymond Mencia, Nick Grabon, Vladimir Manucharyan, *Phys. Rev. X* **9**, 041041(2019)
4. “Asymmetric 3D Elastic–Plastic Strain-Modulated Electron Energy Structure in Monolayer Graphene by Laser Shocking” Maithilee Motlag, Prashant Kumar, Kevin Y. Hu, Ji Li, Jiayi Shao, Xuan Yi, **Yen-Hsiang Lin**, J.C. Walrath, Lei Tong, Xinyu Huang, R. S. Goldman, Lei Ye, Gary J. Cheng, *Advanced Materials* **31**, 1900597(2019)
5. “Quantum electrodynamics of a superconductor-insulator phase transition” Roman Kuzmin, Raymond Mencia, Nicholas Grabon, Nitish Mehta, **Yen-Hsiang Lin**, Vladimir E. Manucharyan, *Nature Physics*, **15**, 930–934 (2019)
6. “Demonstration of protection of a superconducting qubit from energy decay” **Yen-Hsiang Lin**, BaoLong Nguyen, Nick Grabon, Jon San Migue, Vladimir Manucharyan *Phys. Rev Lett.* **120**, 150503(2018)
7. “Superconductivity of very thin films: The superconductor–insulator transition” **Yen-Hsiang Lin**, JJ Nelson, A. M. Goldman *Physica C* **514**, 130(2015).
8. “Profiling the local carrier concentration across a semiconductor quantum dots” J. C. Walrath, **Yen-Hsiang Lin**, S. Huang, R. S. Goldman, *Appl. Phys. Lett.* **106**, 192101 (2015).
9. “Ordered horizontal Sb₂Te₃ nanowires induced by femtosecond lasers” Yuwei Li, Vladimir A. Stoica, Kai Sun, Wei Liu, Lynn Endicott, Jenna C. Walrath, Alex S. Chang, **Yen-Hsiang Lin**, Kevin P. Pipe, Rachel S. Goldman, Ctirad Uher and Roy Clarke, *Appl. Phys. Lett.* **105**, 201904 (2014).
10. “Influence of Sb incorporation on InGaAs(Sb)N/GaAs band alignment” A. S. Chang, E. S. Zech, T. W. Kim, **Y. H. Lin**, L. J. Mawst and R. S. Goldman, *Appl. Phys. Lett.* **105**, 142105(2014).
11. “Dissipative superconductivity: a universal non-equilibrium state of nanowires” Y. Chen, **Yen-Hsiang Lin**, S. Snyder, A. M. Goldman, and A. Kamenev, *Nature Physics*

- 10*, 567 (2014).
12. “The Role of Mesoscopic Disorder in Determining the Character of the Field-Induced Insulating Regime of Amorphous Ultrathin Films” **Yen-Hsiang Lin**, J. Nelson, and A. M. Goldman, *Physica C* **497**, 102(2014).
 13. “Quantifying the Local Seebeck Coefficient with Scanning Thermoelectric Microscopy” J.C. Walrath, **Yen-Hsiang Lin**, K.P. Pipe, R. S. Goldman, *Appl. Phys. Lett.* **103**, 212101(2013).
 14. “Influence of GaAs Surface Termination on GaSb/GaAs Quantum Dot Structure and Band Offsets” E. S. Zech, A. S. Chang, A. J. Martin, J. C. Canniff, **Yen-Hsiang Lin**, J. M. Millunchick, and R. S. Goldman, *Appl. Phys. Lett.* **103**, 082107(2013).
 15. “Suppression of the Berezinskii-Kosterlitz-Thouless Transition in 2D Superconductors by Macroscopic Quantum Tunneling” **Yen-Hsiang Lin**, J. Nelson, and A. M. Goldman, *Phys. Rev Lett.* **109**, 017002(2012).
 16. “Lin and Goldman Reply” **Yen-Hsiang Lin**, and A. M. Goldman, *Phys. Rev Lett.* **108**, 159702(2012).
 17. “Magnetic Field Tuned Quantum Phase Transition in the Insulating Regime of Ultrathin Amorphous Bi Films.” **Yen-Hsiang Lin**, and A. M. Goldman, *Phys. Rev Lett.* **106**, 127003(2011).
 18. “The Stabilization of Superconductivity by Magnetic Field in Out-of-Equilibrium Nanowires”, Y. Chen, **Yen-Hsiang Lin**, S. D. Snyder, and A. M. Goldman, *Phys. Rev. B* **83**, 054505 (2011).
 19. “Hard Energy Gap in the Insulating Regime of Nominally Granular Films Near the Superconductor-Insulator Transition.” **Yen-Hsiang Lin**, and A. M. Goldman, *Phys. Rev. B* **82**, 214511 (2010).
 20. “Evidence of Superconductivity at Somewhat Elevated Temperatures in Strontium Titanate Subjected to High Electric Fields,” **Yen-Hsiang Lin**, Y. Chen, and A. M. Goldman, *Phys. Rev. B* **82**, 172507 (2010).
 21. “Electrostatic Tuning of a Quantum Phase Transition” A. M. Goldman and **Yen-Hsiang Lin**, *J. Phys. Conf. Ser.* **150** 042042 (2009).
 22. “Electrostatic Modification of the Conductive Properties of Amorphous Bi Films,” K. H. S. B. Tan, K. A. Parendo, **Yen-Hsiang Lin**, and A. M. Goldman, *Physica C* **468**, 299 (2008).

PEER REVIEWS

Invited referee for Journal of Applied Physics

Invited referee for Applied Physics A

Invited referee for Scientific Report

Invited referee for Nature Communication

INVITED TALKS

1. “Building quantum information hardware with superconducting fluxonium qubits”, National Taiwan University, Taiwan(03/27/2020).
2. “Building quantum information hardware with superconducting fluxonium qubits”, National Tsing Hua University, Taiwan(03/18/2020).
3. “Cavity-less circuit quantum electrodynamics of a Fluxonium artificial atom”, Alibaba Quantum Laboratory Young Scientist Workshop, Hangzhou, China(10/12~14/2019)
4. “Circuit QED with superconducting fluxonium qubit” George Mason University, Virginia(2/14/2019)
5. “Circuit QED with superconducting fluxonium qubit” National Cheng Kung University, Taiwan,(01/04/2019)
6. Institute of Physics, Academia Sinica, Taiwan,(01/02/2019)
7. National Chung Hsing University, Taiwan,(12/20/2018)
8. “Circuit QED with superconducting fluxonium qubit” National Tsing Hua University, Taiwan,(12/19/2018)
9. JQI-QUICS-CMTS seminar, University of Maryland, MD(12/1/2017)
10. “A Superconducting Qubit with a Superinductor”, University of Minnesota, Minneapolis, MN (10/28/2017)
11. “Atomic Physics of a Multi-level Superconducting Artificial Atom”, 10th Anniversary of JQI, College Park, MD (5/20/2017)
12. From Superinductance to Long-Lived Fluxonium Superconducting Qubit and Beyond” National Tsing Hua University, Taiwan, (2/10/2017)
13. Probing Nanostructured thermoelectric materials using scanning thermoelectric microscopy” University of Maryland, College Park, MD (12/10/2014)
14. “Magnetic Field Tuned Quantum Phase Transition in the Insulating Regime of Ultrathin Amorphous Bi Films.” University of Michigan, Ann Arbor, MI (3/10/2011)

CONTRIBUTED TALKS

1. “Cavity-less circuit quantum electrodynamics of a Fluxonium artificial atom – Experiment” **Yen-Hsiang Lin**, Haonan Xiong, Nathanael Cottet, Long Nguyen, Raymond Mencia, Nicholas Grabon, Aaron Somoroff, Vladimir Manucharyan, 2019 APS March Meeting, Boston, MA(2019/3/4~8)
2. “Fluorescence Readout of a Superconducting Qubit Using a Fluxonium Artificial Atom” **Yen-Hsiang Lin**, Nathanael Cottet, Long Nguyen, Raymond Mencia, Nicholas Grabon, Aaron Somoroff, Vladimir Manucharyan, 2018 APS March Meeting, Los Angeles, CA(2018/3/5~9)

3. “Decoupling a superconducting qubit from dielectric loss and other sources of linear dissipation.” **Yen-Hsiang Lin**, BL Nguyen, J San Miguel, N Garbon, N Pankratova, V Manucharyan, 2017 APS March Meeting, New Orleans, LA(2017/3/13~17)
4. “Fabrication and characterization of highly disordered TiN thin films by reactive evaporation for circuit-QED” **Yen-Hsiang Lin**, R Mencia, BL Nguyen, V Manucharyan, 2016 APS March Meeting, Baltimore, MD(2016/3/14~18)
5. “Profiling the Local Seebeck Coefficient in InAs/GaAs Quantum Dots Using Scanning Thermoelectric Microscopy” **Yen-Hsiang Lin**, J.C. Walrath, Simon Huang, and R.S. Goldman, 2014 APS March Meeting, Denver, CO (2014/3/3~7)
6. “Profiling the Local Seebeck Coefficient with Nanometer Resolution Using Scanning Thermoelectric Microscopy (S_{Th}EM)” **Yen-Hsiang Lin**, J.C. Walrath, and R.S. Goldman, 2013 APS March Meeting, Baltimore, MD (2013/3/18-22)
7. “Magnetoresistance Peak and Quantum Phase Transition in the Insulating Regime of Superconductor-Insulator(SI) Transition” **Yen-Hsiang Lin**, A. M. Goldman, 2011 APS March Meeting, Dallas, TX (2011/3/21-25)
8. “Indirect Magnetic-Field-Tuned Superconductor-Insulator Transitions of Quasi-Two Dimensional Metal Films” **Yen-Hsiang Lin**, A. M. Goldman, 2010 APS March Meeting, Portland, OR (2010/3/15-19)
9. “Superconductor to Quantum Metal Transitions in Ultra Thin Films” **Yen-Hsiang Lin**, A. M. Goldman, 2009 APS March Meeting, Pittsburgh, PA (2009/3/16-20)
10. “Evidence of Spatially Inhomogeneous Pairing on the Insulating Side of a Disorder-Tuned Superconductor-Insulator Transition” K. H. S. B. Tan, K. A. Parendo, **Yen-Hsiang Lin**, A. M. Goldman, and Z. Ovadyahu, 2008 APS March Meeting, New Orleans, LA (2008/3/10-14)

SEMINAR TALKS

- 2008 – 2011, 4 Condensed Matter Sack Lunch Seminar, Physics Department UMN
- “Tuning the Superconductor-Insulator Transitions by Magnetic Fields”
 - “Tuning the Superconductor-Insulator Transitions by Perpendicular Magnetic Fields”
 - “Indirect Magnetic-Field-Tuned Superconductor-Insulator Transitions”
 - “Magnetoresistance Peak in Superconductor-Insulator Transitions”

CONTRIBUTED POSTERS

1. “Thermoelectric Properties of Sn-Doped CoSb₃ and the Exploration of Locally Seebeck Coefficient Using S_{Th}EM” S. Hui, **Yen-Hsiang Lin**, J. Walrath, M. Nielson, D. Medlin, J. Salvador, J. Heremans, R. Goldman, K. Pipe, and C. Uher, 2012 US-China Clean Energy Center Annual Meeting, Ann Arbor, MI(2012/8/27-28)
2. “Scanning Probe Microscopy Studies of Solute Incorporation and Phase Separation in

Novel Semiconductor Alloys” E. S. Zech, A. S. Chang, **Yen-Hsiang Lin**, T. W. Kim, G. Vardar, E.A. Robb, L. Mawst, and R. S. Goldman, University of Wisconsin MRSEC Meeting, Madison, Wisconsin (2012/1/31-2/1)

3. “Fabrication and Characterization of Templated GaN Arrays” S. Jeon, E. Zech, **Yen-Hsiang Lin**, A. Chang, M. Kang, A. A. Al-Heji, S. Huang, G. Vardar, E. A. Robb, and R. S. Goldman, J. Lee, T. W. Saucer, and V. Sih., C-Phom Meeting, Ann Arbor, MI (2011/10/13)

STUDENTS MENTORED:

- 2018~2019 Haonan Xiong- Graduate Student, Physics, University of Maryland
- 2014~2017 Raymond Mancina–Undergraduate Student, Physics, University of Maryland(Now in physics graduate program of University of Maryland)
- 2013~2014 Marissa Viscomi –Undergraduate Student, Material Science & Engineering, University of Michigan (Now in General Motor)
- 2012~2014 Jenna Walrath – Graduate Student, Physics, University of Michigan (Now in Intel)
- 2010~2011 JJ Nelson-Graduate Student, Physics, University of Minnesota (Now in Rochester University)
- 2010 Carolyn Wood – Undergraduate Student, REU, University of Minnesota

SKILLS AND EXPERIENCES:

- UHV vacuum equipment
- Various cryogenic systems including: Dry and wet $^3\text{He}/^4\text{He}$ dilution refrigerators, ^3He refrigerators, ^4He flow-through cryostats, and PPMS.
- Transport measurement including: DC, AC resistance, capacitance, electrostatic gating.
- Microwave measurements and RF components design.
- Thin-film growth: MBE, Pulse laser deposition, and e-beam thermal evaporation.
- Designing and machining instrumental parts: using lathe, mill, and press drill.
- STM, STS, and AFM
- Software: KaleidaGraph, Origin, LabVIEW, Matlab, Mathematica, SPM analysis software(SPIP, Gwyddion), AutoCAD, HFSS, Python.

REFERENCES:

Dr. Allen Goldman

Regents Professor, School of Physics and Astronomy, University of Minnesota

116 Church St. S.E., Minneapolis, MN 55455 USA

(612)624-6062

goldman@physics.umn.edu

Dr. Rachel Goldman

Professor, Materials Science & Engineering, Physics and Electrical Engineering &
Computer Science, University of Michigan

2300 Hayward Street, Ann Arbor, MI 48109-2136 USA

(734)647-6821

rsgold@umich.edu

Dr. Vladimir Manucharyan

Assistant Professor, Department of Physics, University of Maryland

Physics Department, University of Maryland, College Park, MD 20742-4111

(301)314-2159

manuchar@umd.edu