



Tai-Min Liu 劉岱泯

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Quantum Transport Laboratory

Research Field

Electron Transport

Condensed Matter Physics

Education

Ph. D., Physics, University of Cincinnati, USA

Publications

1.1 Journal Paper

1.1.1 Tai-Min Liu, Zong-Wei Wu, Chien-Chen Lee, Pin-Qian Yang, Hua-Shu Hsu, Fang-Yuh Lo (2024 Nov). Influence of rapid thermal annealing in vacuum on the resistive switching of Cu/ZnO/ITO devices. AIP Advances, Volume 14, Issue 11, 115023.

1.1.2 Tai-Min Liu, Zong-Wei Wu, Ting-An Chien, Pin-Qian Yang, Hua-Shu Hsu, Fang-Yuh Lo (2024, Sep). Parallel conducting filaments in resistive switching ZnO thin films. AIP Advances, Volume 14, Issue 9, 095214.

1.1.3 M. Palma, D. Maradan, L. Casparis, T.-M. Liu, F. Froning, D. M. Zumbühl (2017, Apr). Magnetic cooling for microkelvin nanoelectronics on a cryofree platform. Rev. Sci. Instr., 88, 043902.

1.1.4 D. Maradan, L. Casparis, T.-M. Liu, D. E. F. Biesinger, C. P. Scheller, D. M. Zumbühl, J. D. Zimmerman, A. C. Gossard (2014, Jun). GaAs Quantum Dot Thermometry Using Direct Transport and Charge Sensing. Journal of Low Temperature Physics, Volume 175, Issue 5-6, pp 784-798.

1.1.5 C. P. Scheller, T.-M. Liu, G. Barak, A. Yacoby, L. N. Pfeiffer, K. W. West, D. M. Zumbühl (2014, Feb). Possible Evidence for Helical Nuclear Spin Order in GaAs Quantum Wires. Physical Review Letters, 112, 066801.

1.1.6 Tai-Min Liu, Anh T. Ngo, Bryan Hemingway, Steven Herbert, Michael Melloch, Sergio E. Ulloa, and Andrei Kogan (2012, Jul). Quantitative study of spin-flip cotunneling transport in a quantum dot. Physical Review B, 86, 045430.

1.1.7 Tai-Min Liu, Bryan Hemingway, Andrei Kogan, Steven Herbert, and Michael Melloch (2011, Aug). Magnetic splitting of the zero-bias peak in a quantum point contact with a tunable aspect ratio. Physical Review B, 84, 075320.

1.1.8 Chen-Cheng Wu, Tai-Min Liu, Tai-Ying Wei, Li Xin, Yi-Ci Li, Li-Shu Lee, Che-Kai Chang, Jaw-Luen Tang, Sidney S. Yang, and Tai-Huei Wei (2010, Oct). Kramers–Kronig relation between nonlinear absorption and refraction of C60 and C70. Optics Express, Vol. 18, Issue 22, pp. 22637-22650.

1.1.9 Tai-Min Liu, Bryan Hemingway, Andrei Kogan, Steven Herbert, and Michael Melloch (2009, Jul). Magnetic-Field-Induced Crossover to a Nonuniversal Regime in a Kondo Dot. *Physical Review Letters*, 103, 026803.

1.2 Conference Paper

1.2.1 Zong-Wei Wu, Chien-Chen Lee, Ping-Qian Yang, Ting-An Jian, Fang-Yuh Lo, Hua-Shu Hsu, **Tai-Min Liu**, Anneal Temperature Dependence of Resistive Switching in Cu/ZnO/ITO Devices, contributed poster, Physics Annual Meeting, Taoyuan, Taiwan (2024)

1.2.2 Li-Ying Wu, **Tai-Min Liu**, Non-Zero-Crossing Current-Voltage Hysteresis in Cu/Cr₂O₃/ITO Devices, contributed poster, Physics Annual Meeting, Taoyuan, Taiwan (2024)

1.2.3 Zong-Wei Wu, Ping Qian Yang, Ting-An Jian, Fang-Yuh Lo, Hua-Shu Hsu, **Tai-Min Liu***, “Anomalous Resistive Switching Phenomenon of Cu/ZnO/ITO Devices”, contributed poster, *MRM2023/IUMRS-ICA2023 Grand Meeting* (2023)

1.2.4 Zong-Wei Wu, Ting-An Jian, Li-Ying Wu, Fang-Yuh Lo, **Tai-Min Liu**, ZnO based Resistive Switching in Planar and Sandwich Structures, contributed poster, Physics Annual Meeting, Tainan, Taiwan (2023)

1.2.5 Po Yu Lin and **Tai-Min Liu***, “Fabrication and Anisotropy of a Metal-Semiconductor Thermocouple Sensor”, contributed poster, Annual Meeting of Taiwan Thermoelectric Society (2021)

1.2.6 Pinjhen Lin and **Tai-Min Liu***, “Conductance Oscillation in Tunneling Spectroscopy of Quantum Wires”, contributed poster, Physics Annual Meeting, Hsinchu, Taiwan (2017)

1.2.7 **Tai-Min Liu***, “Tunneling Spectroscopy of Quantum Double Wires”, contributed poster, Physics Annual Meeting, Hsinchu, Taiwan (2016)

1.2.8 Yuet-Loy Chan, **Tai-Min Liu***, Dah-An Luh, Meng-Fan Luo, Yao-Jane Hsu, and Der-Hsin Wei “*Status of the Synchrotron-radiation-light-illuminated STM at NSRRC*”, contributed poster, Physics Annual Meeting, Hsinchu, Taiwan (2015)

1.2.9 Yuet-Loy Chan, **Tai-Min Liu***, and Der-Hsin Wei “*Towards a Chemical-Specific STM*”, contributed talk, the 32nd symposium for spectroscopic technologies and surface sciences, Kaohsiung, Taiwan (2014)

1.2.10 Pei-Yu Cheng, Meng-Ruei Chiang, Yuet-Loy Chan, **Tai-Min Liu** and D. H. Wei, “*Metal penetration and its relevance to the magnetic property of C60-Co bilayers*”, contributed poster, Annual meeting of Taiwan Association for Magnetic Technology, Hsinchu, Taiwan (2014).

1.2.11 Pei-Yu Cheng, Meng-Ruei Chiang, Yuet-Loy Chan, **Tai-Min Liu** and D. H. Wei “*Probing the depth of metal penetration in Co-C60 bilayer by NEXAFS*”, contributed poster, twenty first NSRRC Users’ Meeting & Workshop, Hsinchu, Taiwan (2014).

1.2.12 Pei-Yu Cheng, Meng-Ruei Chiang, Yuet-Loy Chan, **Tai-Min Liu** and D. H. Wei “*Metal penetration and its relevance to the magnetic property of C60-Co bilayers*”, contributed poster, International conference of Asian Union of Magnetic Society, Hainan, China (2014).

- 1.2.13 Lucas Casparis, Myrsini Lafkioti, Dario Maradan, **Tai-Min Liu**, Dominik M. Zumbuhl, Christian Reichl, Werner Dietsche, Werner Wegscheider “*Density Gradients in the Integer and Fractional Quantum Hall Effect*”, contributed poster, NCCR QIST Meeting, Zurich, Switzerland (2014)
- 1.2.14 **T. -M. Liu**, B. Hemingway, A. Kogan, S. Herbert, M. Melloch, T. A. Costi, “*Magnetoconductance of single-electron transistor in the Kondo regime*”, APS March Meeting, contributed talk, Dallas, TX, USA (2011)
- 1.2.15 **T. -M. Liu**, A. T. Ngo, B. Hemingway, S. Ulloa, M. Melloch, S. Herbert, A. Kogan, “*A quantitative study of spin-flip cotunneling transport in a quantum dot*”, APS March Meeting, contributed talk, Portland, OR, USA (2010)
- 1.2.16 **T. -M. Liu**, B. Hemingway, A. Kogan, S. Herbert, M. Melloch, “*Magnetic splitting of the zero-bias peak in a quantum point contact with a variable aspect ratio*”, APS March Meeting, contributed talk, Pittsburgh, PA, USA (2009)
- 1.2.17 **T. -M. Liu**, M. Torabi, A. Maharjan, A. Kogan, M. Melloch, S. Herbert, “*Non-linear conductance of a short quantum point contact*”, APS March Meeting, contributed poster, New Orleans, LA, USA (2008)

Academic Projects

2.1 MOST

2.1.1 Principal investigator – Tai-Min Liu

- 2.1.1.1 Influence of Heterogeneous Interfaces on the Resistive Switching Behavior of TiO₂-Based Resistive Memory (NSTC 114-2221-E-153-008 -; 2026/08/01~2028/07/31)
- 2.1.1.2 Quantum Transport in a Single-electron Transistor and Single electron Transistor Arrays under Magnetic Fields (105-2112-M-153-001-MY3; 2016/01/01~2018/12/31)

2.1.2 Co-investigator– Tai-Min Liu

- 2.1.2.1 Pilot Project for Taiwan’s cutting-edge solid state experiment community, south Taiwan hub (111-2112-M-006 -032, 037 -; 2022/08/01~2024/07/31)
- 2.1.2.2 Study of ferrimagnetic transition metal oxide materials with asymmetric antiferromagnetic coupling and antiferromagnetic coupling transition metal oxide materials (MOST 109-2112-M-153-002, 006-; 2020/08/01~2022/10/31)
- 2.1.2.3 The study of interfacial novel physical properties in carbon based composites (MOST 104-2112-M-153-002-MY3; 2017/08/01~2020/10/31)

3.1 Academic Experience

3.1.1 Assistant Researcher, National Synchrotron Radiation Research Center (2014-2015 March)

3.1.2 Post-doctoral Researcher, Dept. of Physics, University of Basel, Basel, Switzerland (2011 – 2013)

3.2 Teaching Experience

3.2.1 Associate Professor, National Pingtung University, Pingtung Taiwan (2024 –)

Solid State Physics, Computer Application in Physics, Modern Physics

3.2.2 Assistant Professor, National Pingtung University, Pingtung Taiwan (2017 – 2024)

Solid State Physics, Computer Application in Physics, Mathematics Physics, Modern Physics

3.2.3 Visiting Assistant Professor, National Pingtung University, Pingtung Taiwan (2015 – 2017)

Solid State Physics, Computer Application in Physics, Surface Science, Mathematics Physics

3.2.4 Lecturer, Dept. of Physics, Univ. of Basel, Basel, Switzerland (2011 - 2013)

Modern Physics and Optics recitations.

3.2.5 Graduate Teaching Assistant, Dept. of Physics, Univ. of Cincinnati, Cincinnati, OH (2005 – 2011)

Assisted in the training and mentoring junior graduate students with laboratory equipment. Assisted in the training and mentoring high school students with their summer science projects. General/College Physics Lab, recitation class, Physics courses grader, and study center tutoring.

3.2.6 Graduate Teaching Assistant, Dept. of Physics, Nat'l Chung Cheng University, Taiwan (2000 - 2002)

Assisted in the training and mentoring junior graduate students with laboratory equipments.

3.2.7 Junior High School Science Teacher, Shanlin Junior High School, Kaohsiung, Taiwan (1999-2000)

Science and computer courses.

3.3 Others

Member of Taiwan Physical Society

TPC Member of International Conference on Applied Physics and Mathematics (ICAPM)