

# 羅儀誠 YI-CHENG LO



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## Education

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### Bachelor's Degree in Electro-Physics (4th Year)

National Yang Ming Chiao Tung University, Hsinchu city

- GPA: 4.23/4.30 (1st ranking in department)

### Relevant Courses:

- 原子尺度量子電子傳導、類比積體電路導論、半導體元件物理、低維系統中的電子傳輸及記憶概念、半導體製程技術 等等

## Academic Honors and Awards

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- 1st place - 電物系專題競賽
- College Of Science Dean Award 2025 (理學院院長獎)
- 6 times Dean's list (書卷獎)
- 3rd place - Final Presentations for UMC summer internships
- Calculus Award (111 Spring)
- 朱順一合勤獎學金

## Research Experience

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### Undergraduate Researcher

Advisor: Prof. Yu-Chang Chen (Dept. of Electrophysics) | Jan. 2025 – Dec. 2025  
*First-Principle Calculations of Quantum Transport for 2D Materials*

- Led a theoretical investigation on quantum transport in periodically nitrogen-doped WSe<sub>2</sub> superlattices, contributing over 80% of the project workflow from simulation to manuscript drafting.
- Demonstrated precise bandgap modulation and a near-ideal subthreshold swing (S.S.) reaching the Boltzmann limit, alongside significant suppression of quantum tunneling leakage in the off-state.
- Evaluated thermoelectric energy conversion potential, discovering that the localized suppression of phonon thermal conductivity yields a 45-fold enhancement in the figure of merit (ZT) at 100K and an exceptional ZT of 2.58 at 300K.

### Undergraduate Researcher : Exploratory Compute Device Laboratory (ECDL)

Advisor: Prof. Tsung-En Lee (Dept. of Microelectronics) | Dec. 2025 – Present  
*Reliability Characterizations and Simulations for 2D Materials*

- Integrate multi-scale physics simulations (ab initio and TCAD) with advanced reliability characterizations to optimize the fabrication and performance of 2D semiconductor devices.
- Modeled the exact mechanisms of precise oxygen substitutional doping in monolayer WSe<sub>2</sub> via UV-O<sub>3</sub> treatments, providing critical physical insights for future 2D gate stack designs.

## Publications

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- **Y-C. Lo**, L.-J. Wang, and Y.-C. Chen, “*Bandgap Engineering of Nitrogen-Doped Monolayer WSe<sub>2</sub> Superlattice and Its Application to Field Effect Transistors*,” *Advanced Electronic Materials*, 2026, <https://doi.org/10.1002/aelm.202500754> (if = **5.3**).
- **Y-C. Lo**, L.-J. Wang, and Y.-C. Chen, “*Gate-Tunable WSe<sub>2</sub> Superlattice Nanojunctions for High-Efficiency Thermoelectric Energy Conversion*,” Currently in review for *ACS Applied Nano Materials* (if = **5.5**).
- **Y-C. Lo**, T-H. Wei, Y-W. Hsu, and T-E. Lee, “*Demonstration of High-Performance AlO<sub>x</sub>-Capped Oxygen-Doped Monolayer WSe<sub>2</sub> p-FETs and First-Principles Investigation of its Atomistic Origins*,” SNDCT 2026

## Internships

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### R&D Device team - RF-SOI (2024 Summer)

United Microelectronic Corporation (UMC)

- Electrical Measurements and analysis of Hi-R and MoM capacitors

## Technical Skills & Languages

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### Experienced with

- QuantumATK, NanoDCAL, VASP, Quantum Espresso, GTS solutions etc.

### English - Fluent in Speaking Writing and Reading.

- TOEIC Listening & Reading : 950/990, Speaking and Writing : 380/400

### Skills

- Python, C++, Matlab, Origin, Labview,

## Others:

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- 理學院代表
- 斐陶斐
- 111級電物系系學會學術長
- 第51屆系刊主編
- 舉辦過兩屆迎新宿營，兩屆電物營，光仁中學新生營，全國大專物理盃
- 汪汪社，吉他社社員
- 電子物理系排球隊副隊長
- 陽明交通大學運動會4\*100接第一名，4\*400接第三名等