Curriculum Vitae

CHIEN-YUAN CHANG, Ph. D. **cychang@ee.nthu.edu.tw**

Professional Experience

Assistant Professor *2023 - present*
Institute of Electronics Engineering, National Tsing Hua University (Taiwan)

Postdoctoral Researcher *2019 - 2023*
Center for Quantum Computing / Center for Emergent Matter Science, Institute of Physical and Chemical Research (RIKEN)

Assistant professor/special postdoc *2018 - 2019*
Dept. of Appl. Phys., The University of Tokyo

Education

Ph.D., School of Physics, **Georgia Institute of Technology, USA** *2011 - 2017*
Ph. D. thesis: *Time-delayed Feedback Control for Solid-State Photon Sources in Classical and Quantum Regime* Advisors: Prof. David S. Citrin

B.S., Electrical Engineering, **National Taiwan University, Taiwan** *2004 - 2008*

Current Field of Interest

- Spin-based physics in semiconductor and superconducting devices
- Codesign of quantum electronics and cryogenic control chip for spin qubits
- Statistical correlation of electron spin dynamics in semiconductor quantum dot

Research projects

Project I: Codesign Semiconductor Quantum Device RIKEN
- Characterize spin qubit in silicon (fabricated by IMEC CMOS process)
- Codesign and benchmark spin qubit (fabricated by TSRI SOI-FinFET process)
- Codesign cryo-electronics of PLL analog circuits (Tape-out using TSMC 40-nm node)

Project II: Generation of Entangled Photon-electron Pairs University of Tokyo
- Obtain single-shot dispersive readout of semiconductor spin qubit
- Generate entangle photon and spin pair through coherent interface
- Investigate electron transport and counting statistics

Supervisor (of both spin qubit projects above): Prof. Seigo Tarucha

Project III: Time-delayed Feedback with Solid-State Photon Sources Georgia Tech
- Demonstrate tunable X-band ($5 \sim 12$ GHz) opto-electronics oscillator
- Automate laser heterodyne experiments for fast dynamical frequency detection
- Realize high-speed photonic reservoir computing, and compressive sensing

Supervisor (of photonic information processing): Prof. David S. Citrin

Project IV: Quantum Control and Stabilization in feedback systems *C2N/CNRS*
- Construct semi-classical ODE model from classical control theory and cavity QED
- Stability analysis of coherent quantum feedback in open quantum systems

Theoretical supervisor (of cQED-based photonic qubit): Prof. Loïc Lanco

Project V: Design and manipulation of a trapped-ion system Georgia Tech
- Sympathetic cooling (Ca and CaH ions) of a molecular ion in a UHV environment
- Automate trapping and shuttling ions in Surface Electrode Ion Traps
- Implement FPGA-based controller and microwave electronics

Supervisor (of trapped-ion qubit): Prof. Kenneth R. Brown

Publication

1. *Quantum repeaters based on spins in gate-defined quantum dots,* **CYC**, K. Kuroyama, M. Larsson, S. Matsuo, A. Ludwig, A. Wieck, A. Oiwa, S. Tarucha, *In preparation*
2. *Hamiltonian Phase Error in Resonantly Driven CNOT Gate Above the Fault-Tolerant Threshold,* Y. -H. Wu, L. Camenzind, A. Noiri, K. Takeda, T. Nakajima, T. Kobayashi, **CYC**, A. Sammak, G. Scappucci, H. -S. Goan, S. Tarucha, *npj Quantum Information*, **10**, 8 (2024)
3. *Observation of nonlocal Josephson effect on double InAs nanowires,* S. Matsuo, J. S. Lee, **CYC**, *et. al. Commun. Phys.* **5**, 221 (2022)
4. *Quantum stabilization of microcavity excitation in a coupled microcavity half cavity system,* **CYC**, Loïc Lanco, and D. S. Citrin, *Phys. Rev. B* **101**, 024305 (2020)
5. *Photogeneration of a single electron from a single Zeeman-resolved light-hole exciton with preserved angular momentum* K. Kuroyama, M. Larsson, **CYC**, J. Muramoto, K. Heya, T. Fujita, G. Allison, S. R. Valentin, A. Ludwig, A. D. Wieck, S. Matsuo, A. Oiwa, and S. Tarucha, *Phys. Rev. B* **99**, 085203 (2019)
6. *Crisis route to chaos in external-cavity semiconductor lasers,* M. J. Wishon, A. Locquet, **CYC**, D. Choi, and D. S. Citrin. *Phys. Rev. A* **97**, 033849 (2018)
7. *Multistate Intermittency on the Route to Chaos of a Semiconductor Laser subjected to Optical Feedback from a Long External Cavity,* D. Choi, Michael J. Wishon, **CYC**, A. Locquet, and D.S. Citrin. *Chaos* **28**, 011102 (2018)
8. *Tunable X-band optoelectronic oscillators based on external-cavity semiconductor lasers,* **CYC**, M. J. Wishon, D. Choi, A. Locquet, K. Merghem, A. Martinez, F. Lelarget, A. Ramdane, and D. S. Citrin. *IEEE J. Quant. Electron.* **99**, 1 (2017)
9. *Compressive Sensing with Optical Chaos,* D. Rontani, D. Choi, **CYC**, A. Locquet, and D.S. Citrin. *Sci. Rep.* **6**, 35206 (2016)
10. *A multi-GHz chaotic optoelectronic oscillator based on a terminal voltage measurement,* **CYC**, D. Choi, A. Locquet, M. J. Wishon, K. Merghem, A. Martinez, F. Lelarget, A. Ramdane, and D. S. Citrin. *Appl. Phys. Lett.* **108**, 191109 (2016)
11. *Low-frequency fluctuation in an external-cavity lasers leading to extreme events,* D. Choi, Michael J. Wishon, J. Barnoud, **CYC**, Y. Bouazizi, A. Locquet, and D.S. Citrin. *Phys. Rev. E* **93**, 042216 (2016)

Selected conference contribution

1. *Polarization-to-spin conversion and entanglement distribution via coherent interface with semiconductor double quantum dot,* **CYC**, K. Kuroyama, M. Larsson, S. Matsuo, T. Fujita, S. Valentin, A. Ludwig, A. Wieck, A. Oiwa, S. Tarucha
   APS March meeting (2019) Boston
2. *Multi-purpose X-band optoelectronic oscillator based in external-cavity laser,* **CYC**, D. Choi, M.J. Wishon, A. Locquet, C. David
   International Topical Meeting on Microwave Photonics, 2017
3. *Dynamics of Time-delayed Feedback with Single Photon Emitter in Fock States,* **CYC**, D.S. Citrin
   9th International Conference on Quantum Dots 2016
4. *Quantum Feedback Control: Single Photon Emitter in External Cavity Device,* **CYC**, D.S. Citrin
   Asian Quantum Information Science Conference (AQIS) 2016
5. *Simultaneous Bifurcation Diagrams of Carrier Number and Optical Intensity of External Cavity Laser,* **C. Y. Chang**, D. Choi, A. Locquet, M. J. Wishon, K. Merghem, A. Ramdanem, F. Lelarge, A. Martinez and D. S. Citrin
   CLEO 2016