

MING LYU

Department of Electrical Engineering
Princeton, New Jersey 08544

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GitHub: CareF

EDUCATION

Princeton University

Expected 2021

Ph.D. in Electrical Engineering, Advisor: Dr. Claire Gmachl
Research Field: GaAs Quantum Cascade Devices

Tsinghua University

July 2016

B.S. in Physics, graduation with honors (GPA: 93.0/100, Rank: top 3/33)
Minor in Computer Science and Technology (GPA: 92.9/100)

Awards: 2016 Chi-Sun Yeh Award (highest honor for physics undergraduate); 2016 Honored Graduate in Beijing; 2015 Outstanding Student Leader; 2013 – 2016 Outstanding Student Scholarship

PUBLICATION

“Correction to the Effective Refractive Index and the Confinement Factor in Waveguide Modeling for Quantum Cascade Lasers”, ArXiv: 2007.03503 (2020), M. Lyu, C. Gmachl

“Design and Characterization of 14 – 20 μ m Wavelength GaAs/AlGaAs Quantum Cascade Lasers”, Infrared Terahertz Quantum Workshop (2019), M. Lyu, Loren Pfeiffer, Ken West, C. Gmachl

“Design and Optimization of 14 – 20 μ m Wavelength GaAs/AlGaAs Quantum Cascade Lasers”, 4th International Workshop on Infrared Technologies (2017), M. Lyu, C. Gmachl

“Single-Qubit Quantum Memory Exceeding Ten-minute Coherence Time”, Nature Photonics 11, 646-650 (2017), Y. Wang, M. Um, J. Zhang, S. An, M. Lyu, J.-N. Zhang, L.-M. Duan, D. Yum, K. Kim

“Non-Markovian Dynamics of Open Quantum Systems without Rotating Wave Approximation”, ArXiv:1407.5359 (2014), M. Tang*, Y. Wu*, M. Lyu*, J. Tang, Z. Guo, T. Chen, X.-B. Wang (*equal contribution)

RESEARCH

Longwave Infrared GaAs/AlGaAs Quantum Cascade Laser

May 2017 – present

PhD Research

Princeton University

- Rewrote the numerical simulation tool: **ErwinJr 2** (github.com/CareF/ErwinJr2)
 - Designed for modeling the spectrum and scattering processes in Quantum Cascade superlattices
 - Implemented new eigen-solver and ODE solver, with OpenMP parallelization
 - Utilized PyQt and matplotlib for GUI different modules
- Explored new algorithms with knowledge of semi-periodic system
- Developed fabrication recipes and measurement setups

Long Coherence Time Quantum Memory on Ion Trap System

Oct. 2015 – June 2016

Undergraduate Senior Thesis

Tsinghua University

- Studied control RF pulse signal design and generation
- Explored new cavity design for ion trap system

Electron Spin Resonance for Quantum Information Application

July 2015 – Sept. 2015

Research Assistant

Institute for Quantum Computing (IQC)

- Improved data analysis with combination of knowledge in both time and frequency domain

Non-Markovian Dynamics of Open Quantum Systems

Apr. 2014 – June 2014

Undergraduate Research

Tsinghua University

OTHER PROJECTS

NeoWeather

github.com/CareF/deepin-dock-plugin-neoweather

A weather plugin based on [OpenWeatherMap.org](https://openweathermap.org) API for Deepin Desktop Environment on Linux

AI for connect4 board game

2015 Spring

Course project for “Introduction for Artificial Intelligence”

- Implemented Monte Carlo tree search with adaptive sampling
 - Modified with alpha-beta pruning and depth-first-search at the leaf node
- Beat 98% of competitors

SomePhys: a simple physics engine

2015 Autumn

Joint course project for “Fundamentals of Computer Aided Design” and “Software Engineering”

- Implemented Newtonian mechanics simulation and OpenGL rendering
- Created demos for chaotic phenomenon

PROFESSIONAL EXPERIENCE AND SOCIAL SERVICES

Software Engineer Intern

May 2020 – Aug. 2020

Google LLC. Platform and Ecosystem

- Developed a solution for host-independent performance test
- Top community contributor of Flutter 1.20

Teaching Assistant

School of Engineering and Applied Science, Princeton University

- APC 523: Numerical Algorithms for Scientific Computing 2020 Spring
- ELE 351: Electromagnetic Field Theory and Physical Optics 2019 Spring
 - Tested, prepared and helped students with numerical simulation tools for Maxwell equations
- ELE 308: Electronic and Photonic Devices 2018 Fall
 - Helped students with fabrication of Si-based devices
- EGR151: Foundations of Engineering : Mechanics, Energy, and Waves 2017 Fall
 - Taught lab sessions for general physics and creative thinking

President of Student Association for Science and Technology

2015

Physics Department, Tsinghua University

- Led the update of the student-run server and the transport of department-wise SNS website and FTP services
- Organized student academic colloquium
- Organized campus-wise competition for China Undergraduate Physics Tournament

Founder and Team Leader of Student Debate Team in Physics Department

2013 – 2016

Zhihu.com (Chinese Quora) Outstanding Answerer on Physics and Quantum Physics

24k followers

SKILLS

Programming: Python, C, C++, Qt, Git, L^AT_EX, OpenMP (basic), Bash (basic)

Experiment: Cleanroom Fabrication, Nano-structure Imaging, Infrared and Laser Optics