Ming **Lyu** (吕铭)

PhD candidate, Electrical Engineering, Princeton University

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Applied Physics, Optics, Photonics, Semiconductors, Computer Science

I am a PhD student doing research on Quantum Cascade Laser, with physics background and some experience of Quantum Information, Quantum Computing and Quantum Optics. I am interested in Computer Science and Technology and familiar with high-tech development.

Education

Princeton University
09/2016 - expected 2021

PhD in Electrical Engineering (GPA 3.891/4.0)

- Advisor : Dr. Claire Gmachl
- Long wavelength Quantum Cascade Laser and GaAs/AlGaAs Photonic Devices

Semiconductor Device | Infrared Optics | Laser and Detector | Chemical and Bio-sensing

Tsinghua University
08/2012 - 07/2016

B.S. in Physics (GPA : 93.0/100, top 3/33), Minor in Computer Science (GPA 92.9/100)

- Thesis : "*Long Coherence Time Quantum Memory on Ion Trap System with Dynamical Decoupling*" (Thesis Advisor : Dr. Kihwan Kim)
- Graduate with hornor : 2016 "Chi-Sun Yeh" Award (highest honor for physics undergraduate), 2016 Beijing Outstanding Graduate, 2013-2016 Outstanding Student Scholarship

Profesional experience

University of Waterloo
07/2015 - 09/2015

Research Assistant, The Institute for Quantum Computing (IQC)

- Advisor : Dr. Raymond Laflamme, Dr. Guanru Feng
- Electron Spin Resonance implementation of Quantum Computing and Simulation

Princeton University

Teaching Assistant, School of Engineering and Applied Science

2019 Spring
- ELE 351 : Electromagnetic Field Theory and Physical Optics
  - Prepared and helped students with numerical simulation tools for Maxwell equations

2018 Fall
- ELE 308 : Electronic and Photonic Devices
  - Fabrication of Si-based devices like MOSFET, CMOS, PN junction, solar cells, etc.

2017 Fall
- EGR 151 : Foundations of Engineering : Mechanics, Energy, and Waves
  - Lab sessions for physics and creative thinking

Publication

"**Design and Characterization of 14 –20µm 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 µm Wacelength 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 :1047.5359 (2014), M. Tang*, Y. Wu*, **M. Lyu***, J. Tang, Z. Guo, T. Chen, X.-B. Wang (*equal contribution)

Social Services and Activities

Vise-president : Association of Chinese Students and Scholars at Princeton University (ACSSPU) 03/2018 - 04/2019
- Coordinated advertising and public relationships
- Built connection with student groups for unionization issue

President : Student Association for Science and Technology, Physics Department, Tsinghua University 06/2015 - 07/2016
- Led the update of the student-run server and department SNS website and FTP services
- Organized student academic colloquium
- Organized campus competition for China Undergraduate Physics Tournament

Vice-president : Student Union, Physics Department, Tsinghua University 09/2014 - 02/2015
- Coordinated the department hearing for students' right and benefit
- Coordinated department student orientation
- Connected students and school administration for housing issues
- Organized the practice of December-9th Chorus Competition

Founder and Team Leader : the Student Debate Team in Physics Department, Tsinghua University 09/2013 - 05/2016

- Won the promotion to the First Division in 2013
- Achieved top 8 team in 2014, 2015

Zhihu.com Outstanding Answerer on Physics and Quantum Physics 知乎 逸心 , with 16k followers

Projects

ErwinJr2 2017 - PRESENT

github.com/CareF/ErwinJr2

A quantum cascade laser numerical simulation software, with GUI and data visualization. The computational intense part is coded by C and integrated into Python. New eigen-solver with knowledge of semi-periodical structure was implemented, optimized with OpenMP parallelization.

Python | C | Qt | OpenMP | matplotlib | doxygen | sphinx | continuous integration

NeoWeather 2018 - PRESENT

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

A weather plugin based on `OpenWeatherMap.org` API for Deepin Desktop Environment on Linux

C++ | Qt | Linux | RESTful API

AI for connect4 board game 2015 Spring

Course project for "introduction for Artificial Intelligence"
Implemented Monte Carlo tree search with adaptive sampling, and modified the algorithm with alpha-beta prunning and depth-first-search at the leaf node. The result beat 98% competitors.

C++ | Monte Carlo Tree search

SomePhys : a simple physics engine 2015 Autumn

Joint course project for "Fundamentals of Computer Aided Design" and "Software Engineering"
Implemented Newtonian mechanics simulator and OpenGL rendering. Created demos for chaotic phenomenon.

C++ | OpenGL | Qt

Skills

Languages	Chinese (native), English (fluent)
Programing	Python, C, C++, Qt, Git, LaTeX, OpenMP (basic), Bash (basic)
Experiment	Cleanroom Fabrication, Nano-structure Imaging, Infrared and Laser Optics