Parthorn Ammawat

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Education

California Institute of Technology — Sept 2022 – Expected June 2026
BS in Electrical Engineering and Applied Physics (Double Major) — GPA: **4.2/4.0**

Research Experience

Painter Lab, Caltech — Pasadena, CA
***Research Assistant**, supervised by Prof. Oskar Painter* — Apr 2024 – Present

- Develop a Josephson junction fabrication process based on the PICT method for improved device coherence
- Design and fabricate an electromagnetic cat qubit as a first step toward realizing a hybrid cat qubit incorporating a mechanical quantum memory
- Designed, fabricated, and characterized a superconducting transmon qubit module with 300% improved quantum coherence and a 30% higher photon absorption rate for integration with a quantum transducer

Nonlinear Photonics Laboratory, Caltech — Pasadena, CA
***Research Assistant**, supervised by Prof. Alireza Marandi* — Jan 2023 – Present

- Lead the design and fabrication of on-chip coupled optical parametric oscillators to demonstrate spectral phase transitions and to serve as a foundation for developing an on-chip optical Ising machine
- Perform various optical characterization measurements, including fiber-chip-fiber transmission and quasi-phase-matching test
- Designed and fabricated various types of on-chip optical couplers using FDE, EME, and FDTD simulations for performance analysis

Teaching Experience

Teaching Assistant — Pasadena, CA

- Hosted weekly office hours and recitation sessions for 20 - 150+ students
- Designed, graded, and wrote detailed solutions for exams and weekly problem sets

***Methods of Applied Mathematics for the Physical Sciences* (ACM 95/100b)** — Apr 2025 - June 2025

- Topics: Eigenvalue problems, transform methods, second-order PDEs, and Green's functions

***Physics of Electrical Engineering* (EE 40)** — Jan 2025 - Mar 2025

- Topics: Transmission lines, piezoelectricity, waveguides, resonators, semiconductor physics, and optoelectronic devices

***Deterministic Analysis of Systems and Circuits* (EE 44)** — Sept 2024 - Dec 2024

- Topics: Mathematical modeling of physical systems, deterministic analysis methods, and solution techniques like Laplace/Fourier transforms

***Waves, Quantum Mechanics, and Statistical Physics* (Ph 2a)** — Sept 2023 - Dec 2023

- Topics: Oscillations, waves, coupled oscillators, diffraction, Fourier analysis, and quantum mechanics

Awards

Henry Ford II Scholar Award (details) — 2025

Nellie Bergen and Adrian Foster Tillotson Summer Undergraduate Research Fellowships — 2024

Caltech Summer Undergraduate Research Fellowships (SURF) — 2023

Silver Medal (Top of Thailand Team), **International Physics Olympiad (IPhO)** — 2021

Relevant Courses (Graduate-Level)

Physics/Math	Complex Analysis, ODEs, and PDEs; Electromagnetic Theory for Photonics; Quantum Mechanics; Probabilistic Models; Quantum Electronics; Advanced Experimental Physics
EECS	Electromagnetic Engineering; Advanced Lasers and Photonics Lab; Advanced Digital Systems Design; Signals, Systems, and Transforms; Analog Circuit Design

Skills

Programming/Software	Python, MATLAB, Lumerical, Palace, Assembly, VHDL, Sonnet, Julia, Cadence
Technical Skills	E-beam Lithography (EBPGs), SEM, AFM, Qubit Characterization, Fiber-Chip Optical Measurements, Optical Alignment, Cryogenic Measurements
Languages	Thai (Native), English (Bilingual Proficiency)