Claire T. Chen

Physics & Astrophysics Undergraduate Student, UC Berkeley

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Undergraduate student, Astrophysics and Physics at UC Berkeley. Passionate about arts, science, and engineering, and my dream is to apply all three to explore and understand the universe. Research interests in fusion energy, plasma physics, and cosmology.

Education

University of California Berkeley — *Berkeley, CA, USA*

B.A. **Astrophysics**; intended B.A. **Physics** — *Aug 2021 - May 2025*

- GPA: 3.6
- Facilitator, **Python DeCal - Introduction to Computational Methods for Astronomers**, Jan 2022 - Dec 2022
- Instructor, **DeCal - Hands-On PCB Engineering** Aug 2022 - Dec 2022

Experience

Commonwealth Fusion Systems — *Devens, MA*

Technical Intern, Tokamak Operations Team — *May 2023 - Aug 2023*

- Developed *simpleopt*, a code for autonomous generation of plasma facing component designs to minimize heat flux
- Used the Heat flux Engineering Analysis Toolkit (HEAT) to analyze operational space of divertor components in the SPARC tokamak

Space Enterprise at Berkeley (SEB) — *UC Berkeley*

Avionics Lead — *Aug 2021 - present*

- Leading a team of 10 in developing ground support and flight avionics for our spaceshot liquid bipropellant rocket Eureka-3
- Led avionics development for engine thrust vector control, which helped SEB win the first $15,000 prize of the Lander Challenge
- Designed and built flight computer for Eureka-1, our first liquid bipropellant rocket
- Organized workshops for teaching PCB design, PCB assembly, and firmware development to new members

Space Sciences Laboratory - Compton Spectrometer and Imager (COSI) — *UC Berkeley*

Student Researcher, Deputy Systems Engineer | Advisor: Dr. John Tomsick — *Jan 2022 - present*

- Designed and characterized analog electronics for the Background and Transient Observer (BTO) instrument
- Worked with international team to define requirements for BTO electronics and system design
- Designed BTO's electronics architecture, defined design for control and data interfaces

SALT Research Group — *UC Berkeley*

Student Researcher | Advisor: Prof. Raluca Scarlat — *Aug 2023 - present*

- Building electrochemistry models with COMSOL to predict tritium diffusivity in FLiBe
- Working with team from Commonwealth Fusion Systems to use simulations in informing electrode design, FLiBe testing campaign

GNOME @ Berkeley — *UC Berkeley*

Student Researcher | Advisor: Prof. Dmitry Budker — *Aug 2021 - Jan 2022*

- Worked on controls for laser frequency, and synchronizing a network of atomic magnetometers

University of Florida Astronomy — *University of Florida*

Student Researcher | Advisor: Prof. Jian Ge — *2020 - 2021*

- Developed methods to search for small exoplanets with neural networks
- Developed procedure for utilizing GPU processing to rapidly normalize, fold, and analyze Kepler Space Telescope lightcurve data
- Presented results at Regeneron Science Talent Search, Synopsys Science Fair 2021; received SETI Institute Honorable Mention

Homestead Robotics (FRC Team 670) — *Cupertino, CA*

Tech Lead & VP of Development — *2017 - 2021*

- Led design of high level software, control and electrical systems, organized team of 40 students in creating competitive robots
- Developed curriculum for programming, controls, and electronics workshops for team and Western Region Robotics Forum events
- Collaborated with leadership across Fremont Union High School District to develop an initiative to build a robotics facility

Posters & Research Presentations

- **Minimizing Plasma-Facing Component Heat Flux Using Unsupervised Mesh Generation**: Poster presentation at Princeton Plasma Physics Laboratory Graduate Summer School; Princeton, NJ; August 2023

- **Exploring Autonomous Optimization of PFC Designs**: Commonwealth Fusion Systems; Devens, MA; August 2023
- **Heat Flux Analysis to Generative Design**: Commonwealth Fusion Systems; Devens, MA; August 2023
- **Designing a Receiver for the Cosmic Microwave Background**: Final project report for Astro 161: Relativistic Astrophysics and Cosmology; UC Berkeley; May 2023
- **Eureka-1: The Path to Launch**: Presentation with SEB; UC Berkeley Space Sciences Laboratory; February 2023
- **A Search For Planet Candidates in Kepler Data with Deep Neural Networks**: For Synopsys Science Fair 2021; Cupertino, CA; March 2021

Publications

- Gulick, Hannah; Yoneda, Hiroki; Takahashi, Tadayuki; **Chen, Claire**; et. al. (14 other co-authors), submitted October 2023. ***A Study of Afterglow Signatures in NaI and CsI Scintillators for the Background and Transient Observer Instrument on COSI***, Nuclear Inst. and Methods in Physics Research, A.

Skills

Programming Languages	Python, Java, C, C++, HTML, Javascript, CSS
Python Libraries	Numpy, Matplotlib, Tensorflow, Keras, Pandas, Scipy, Astropy, FFmpeg, Pymoo, VTK, Multiprocessing
Electronics	Altium Designer, LTSpice, PCB design + assembly, electronics testing, Ansys HFSS
General engineering	COMSOL, TiG welding, basic machining
Media	Graphic design, digital illustration, UX design, DaVinci Resolve, Adobe Photoshop
Languages	English, Mandarin Chinese, French

Other Experience

Homestead High School
Cupertino, CA

Java Student Tutor
2019 - 2021

- Tutored students by helping with in-class lab work and advising for final projects
- Helped write and grade assignments and quizzes, and reviewed final project proposals and presentations
- Worked with Computer Science teachers to improve student support in introductory Java classes

Illustration & Graphic Design
UC Berkeley, Darrington Press

Digital Illustrator & Graphics Designer
2020 - PRESENT

- Created graphics (apparel design, mission patches, stickers, posters) for Space Enterprise at Berkeley
- Apparel design for UC Berkeley Astronomy
- Digital illustration for Darrington Press; work featured in Critical Role