# Tin Long Sunny Wong

tinlongsunny@ucsb.edu

ORCID:0000-0001-9195-7390 sunnywong314.github.io

## Research Interests

Computational and theoretical stellar evolution, Binary evolution, Transients, Compact objects, Accretion phenomena, White Dwarf, Supernovae.

## Academic employment

Graduate student researcher, University of California, Santa Barbara — 2019 - present

## Education

**PhD** **University of California, Santa Barbara**, Physics — September 2019 - present
- GPA: 3.94/4.0, Advisor: Prof. Lars Bildsten

**MA** **University of California, Santa Barbara**, Physics — Awarded August 2022

**BS** **University of California, Santa Cruz**, Physics (Astrophysics) — Sept 2015 – June 2019
- *Summa Cum Laude*, GPA: 4.0/4.0, Advisor: Prof. Enrico Ramirez-Ruiz

## Publication Summary

**10** refereed publications (**6** first-author)

## First-Author Refereed Publications

1. **T.L.S. Wong**, C. White, L. Bildsten. *Shocking and Mass Loss of Compact Donor Stars in Type Ia Supernovae*. ApJ, 973:65(14pp), September 2024
2. **T.L.S. Wong**, L. Bildsten. *The Asteroseismological Richness of RCB and dLHdC Stars*. ApJ, 962:20(8pp), February 2024
3. **T.L.S. Wong**, L. Bildsten. *Dynamical He Flashes in Double White Dwarf Binaries*. ApJ, 951:28(10pp), July 2023
4. **T.L.S. Wong**, L. Bildsten. *Mass Transfer and Stellar Evolution of the White Dwarfs in AM CVn Binaries*. ApJ, 923:125(10pp), December 2021
5. **T.L.S. Wong**, J. Schwab, Y. Götberg. *Pre-explosion Properties of Helium Star Donors to Thermonuclear Supernovae*. ApJ, 922:241(13pp), December 2021
6. **T.L.S. Wong**, J. Schwab. *Evolution of Helium Star-White Dwarf Binaries Leading up to Thermonuclear Supernovae*. ApJ, 878:100(27pp), December 2021

## Other Refereed Publications

1. K. Burdge, K. El-Badry, S. Rappaport, **T.L.S. Wong**, et al. *Orbital Decay in an Accreting and Eclipsing 13.7 Minute Orbital Period Binary with a Luminous Donor*. ApJL, 953:1(11pp), August 2023
2. A. Jermyn et al. incl. **T.L.S. Wong**. *Modules for Experiments in Stellar Astrophysics (MESA): Time-Dependent Convection, Energy Conservation, Automatic Differentiation, and Infrastructure*. ApJS, 265:15(38pp), March 2023
3. J. van Roestel, T. Kupfer, M. Green, **T.L.S. Wong**, et al. *Discovery and characterization of five new eclipsing AM CVn systems*. MNRAS, 512:5440(21pp), June 2022
4. G. M. Brandt, T. Dupuy, Y. Li, M. Chan, T. Brandt, **T.L.S. Wong**, et al. *Improved Dynamical Masses for Six Brown Dwarf Companions Using Hipparcos and Gaia EDR3*. ApJ, 162:301(28pp), December 2021

## Other Scientific Works

1. **T.L.S. Wong**, J. van Roestel, T. Kupfer, L. Bildsten. *An Outburst by AM CVn Binary SDSS J113732.32+405458.3*. RNAAS, 5:3(3pp), January 2021

## Awards & Scholarships

- Chair's Special Recognition Award, for service to the department (UCSB) 2024
- Paxton Summer Fellowship in Theoretical Astrophysics (UCSB) 2020
- Steck Family Award for Finest Senior Thesis (UCSC) 2019
- Priscilla Parkin Memorial Scholarship Award (UCSC) 2019
- Koret Undergraduate Research Scholarship (UCSC) 2018-2019
- Ron Ruby Memorial Scholarship (UCSC) 2018
- Dean's Honor List (UCSC) 2015-2019
- Undergraduate Dean's Scholarship (UCSC) 2015-2019

## Invited Talks

1. **Zwicky Transient Facility Theory Network Meeting**, Oak Creek Ranch, Santa Maria, CA, USA, *"Type Ia Supernovae interacting with degenerate companions"*, September 2024
2. **ITC luncheon**, Harvard-Smithsonian Center for Astrophysics, Boston, MA, USA, *"Ia supernova ejecta interacting with companion stars"*, September 2024
3. **White Dwarfs and Transients Science Retreat**, Cambria, CA, USA, *"Double White Dwarf Binaries, their explosions and their survivors"*, June 2024
4. **TAPIR seminar**, California Institute of Technology, Pasedena, CA, USA, *"Double White Dwarf Binaries, their explosions and their survivors"*, May 2024
5. **UCSB Astro Lunch**, University of California, Santa Barbara, Santa Barbara, CA, USA, *"Supernova ejecta interacting with companion stars"*, May 2024
6. **Zwicky Transient Facility Theory Network Meeting**, Oak Creek Ranch, Santa Maria, CA, USA, *"Shocking Helium White Dwarf Donor With Supernova Ejecta"*, September 2023
7. **White Dwarfs as Probes of the Evolution of Planets, Stars, the Milky Way and the Expanding Universe program**, Kavli Institute of Theoretical Physics, Santa Barbara, CA, USA, *"Mass Transfer in AM CVn binaries: A Tale of Two Cooling WDs"*, December 2022
8. **Zwicky Transient Facility Theory Network Meeting**, Oak Creek Ranch, Santa Maria, CA, USA, *"He Flash Due to Mass Transfer from High-entropy He WDs"*, September 2022

## Contributed Talks

1. **23nd European Workshop on White Dwarfs**, Barcelona, Spain, *"Ia supernova ejecta interacting with companion stars"*, July 2024
2. **5th International Workshop on AM CVn Binaries**, Armagh Observatory and Planetarium, Northern Ireland, UK, *"Mass Transfer and WD Cooling in AM CVn Systems"*, September 2023
3. **4.5th International Workshop on AM CVn Binaries**, online, *"Mass Transfer in AM CVn binaries: A Tale of Two Cooling WDs"*, August 2022
4. **22nd European Workshop on White Dwarfs**, Tuebingen, Germany, *"He Flash Due to Mass Transfer from High-entropy He WDs"*, August 2022

## Contributed Poster Presentations

1. **22nd European Workshop on White Dwarfs**, Tuebingen, Germany, *"Mass Transfer in AM CVn Binaries"*, August 2022
2. **American Astronomical Society 233rd Meeting**, Seattle, WA, USA, *"Evolution of Helium Star - White Dwarf Binaries Leading up to Thermonuclear Supernovae"*, January 2019
3. **21st European Workshop on White Dwarfs**, Austin, TX, USA, *"Evolution of Helium Star - White Dwarf Binaries with Different Angular Momentum Prescriptions"*, July 2018

## Teaching experience

**University of California, Santa Barbara**

- Phys 132 *Stellar Structure and Evolution*, **Associate Instructor** — Winter 2024
  – lectures, course material and homework development, office hours, grading
- Phys 232 *Stellar Structure and Evolution* (Graduate course), **Guest Lecturer** — Fall 2023
  – lecture on radiative heat transport
  – MESA code consultant
- Phys 232 *Stellar Structure and Evolution* (Graduate course), **Guest Lecturer** — Spring 2022
  – lecture on ionization balance
- Phys 132 *Stellar Structure and Evolution*, **Teaching Assistant** — Winter 2021
  – office hours, grading
- Astro 1 *Basic Astronomy*, **Teaching Assistant** — Fall 2019, Spring 2020, Winter 2021
  – office hours, grading
- Phys 3L *Physics Laboratory*, **Teaching Assistant** — Fall 2019
  – office hours, grading, lab demonstration

**Modules for Experiments in Stellar Astrophysics (MESA) Summer School**
– Workshop on using the 1D stellar evolution code MESA

- **Lecturer** – design and oversight of hands-on lab sessions, lecture on binary white dwarfs — 2024
- **Teaching assistant** – design and testing of hands-on lab sessions — 2017, 2018, 2021, 2022, 2023

## Outreach & Service

- Journal referee; MNRAS; 2024
- **Astronomy on Tap** talk; *"The Fastest Stars in the Galaxy"*, Santa Barbara, CA, USA, April 2024
- **UCSB Astronomy Society** talk, *"Double White Dwarf Binaries"*, UCSB, Santa Barbara, CA, USA, Feb 2023
- **UCSB Astronomy Society Astronomy Night** graduate student volunteer, 2019 - present

## Software

**Programming:** Python, Fortran, C++, Mathematica, Latex, bash

**Scientific Sofware:** Modules for Experiments in Stellar Astrophysics (`MESA`), `Athena++` (3D hydrodynamics), `GYRE` pulsations code
**High-performance computing:** Experience with supercomputing clusters at UCSB, UCSC, and the Flatiron Institute