

Lingfeng Wei

Postdoctoral Scholar at University of California, Los Angeles

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EMPLOYMENT

- **Postdoctoral Scholar**, University of California, Los Angeles 2025 – Present

EDUCATION

- **University of California, San Diego** 2019 – 2025
Physics, Ph.D. GPA: 3.83/4
- **University of California, San Diego** 2019 – 2022
Physics, M.S.; Ph.D. Candidate GPA: 3.83/4
- **Zhejiang University** 2015 – 2019
Physics, B.S.; Minor in Advanced Honor Class for Engineering Education GPA: 3.89/4

FELLOWSHIP

- LSST Discovery Alliance Data Science Fellowship Program 2021 – 2023

RESEARCH PROJECT

- **Formation and Evolution of the Nuclear Star Cluster (NSC)** 2025 – Present
Advisor: Prof. Tuan Do *University of California, Los Angeles*
 - Building a precise astrometry pipeline for proper motion measurements of JWST NIRCам Images.
 - Modeling the stellar density profile to differentiate between NSC and nuclear stellar disk (NSD).
 - Characterizing the internal kinematics of the NSC and testing the formation mechanism predictions.
- **Structure and Dynamics of Westerlund 1** 2023 – 2025
Advisor: Prof. Jessica Lu, Prof. Quinn Konopacky *UC San Diego, UC Berkeley*
 - Analyzed the structure and the unusual initial mass function of the star cluster Westerlund 1 with observational data from the Hubble Space Telescope.
 - Modeled the stellar membership probability using the Gaussian mixture model and simulated stars.
- **Mass-dependent Kinematics of the Orion Nebula Cluster** 2020 – 2023
Advisor: Prof. Quinn Konopacky, Prof. Chris Theissen *University of California, San Diego*
 - Modeled the stellar spectra of the Orion Nebula Cluster (ONC) from the W. M. Keck Observatory for stellar parameters using Markov Chain Monte Carlo (MCMC) ensemble sampler and nested sampling.
 - Analyzed the 3D mass-dependent kinematics of the ONC to understand star formation processes in star clusters and compared with hydrodynamical simulations.
- **Relativistic Dynamical Stability Criterion of Multiplanet Systems** 2018 – 2021
Advisor: Prof. Smadar Naoz *University of California, Los Angeles*
 - Developed a relativistic stability criterion of hierarchical multi-planetary systems.
 - Validated the criterion through N-body numerical simulations.
 - Modified the existing simulation software to incorporate the effect of general relativity.

OBSERVATION PROJECT

- **Co-I: Roman Galactic Center Project.** Roman Space Telescope, Cycle 1 #19078 2026
- **Principal Investigator (PI): Pilot Observation of Westerlund 1 To Probe Star Formation From Kinematics with IGRINS.** Gemini South Telescope, Fast Turnaround 2023
- **Co-I: Completing the stellar census of Westerlund 1.** Hubble Space Telescope, Cycle 30, #17119 2022
- **Co-I: Dynamics of the Orion Nebula Cluster: Mass-Dependent Kinematics.** Keck Observatory 2021

PUBLICATION

- **Wei, L.**, Lu, J. R., Boyle, P. C., et al., *Structure and Dynamics of the Young Massive Star Cluster Westerlund 1*, *ApJ*, 992, 213, doi:10.3847/1538-4357/adfc60
- **Wei, L.**, Theissen, C. A., Konopacky, Q. M., et al. 2024, *The 3D Kinematics of the Orion Nebula Cluster II: Mass-dependent Kinematics of the Inner Cluster*, *ApJ*, 962, 174. doi:10.3847/1538-4357/ad1401.
- **Wei, L.**, Naoz, S., Faridani, T., et al. 2021, *Relativistic Dynamical Stability Criterion of Multiplanet Systems with a Distant Companion*, *ApJ*, 923, 118. doi:10.3847/1538-4357/ac2c70
- Faridani, T. H., Naoz, S., **Wei, L.**, et al. 2022, *Hiding Planets Near and Far: The Parameter Space of Hidden Companions for Known Planetary Systems*, *ApJ*, 932, 78. doi:10.3847/1538-4357/ac6e38
- Theissen, C. A., Konopacky, Q. M., Lu, J. R., et al. (including **Wei, L.**) 2022, *The 3D Kinematics of the Orion Nebula Cluster: NIRSPEC-AO Radial Velocities of the Core Population*, *ApJ*, 926, 141. doi:10.3847/1538-4357/ac3252

SOFTWARE DEVELOPMENT

- **SMART**: Spectral Modeling Analysis and RV Tool (Developed Spectral Modeling MCMC Algorithm) | 
- **SPISEA**: Stellar Population Interface for Stellar Evolution and Atmospheres (Optimized and parallelized point-in-polygon test) | 
- **Rings-GR**: Secular orbital evolution simulator (Incorporated general relativity) | 

PRESENTATION

- Poster: **Traversing the Galactic Center in Space and Time**, *JWST NIRCcam survey of the Milky Way Nuclear Star Cluster* Brno, Czech, 2026
- Talk: **Keck Science Meeting**, *The 3D Kinematics of the Orion Nebula Cluster: Mass-dependent Kinematics of the Inner Cluster* Berkeley, CA, 2023
- Poster: **Protostars and Planets VII**, *Mass-Dependent Kinematics in Orion Nebula Cluster as Tracers of Formation and Evolution* Kyoto, Japan, 2023
- Poster: **Cambridge Workshops of Cool Stars, Stellar Systems and the Sun 21 (Cool Stars 21)**, *Star Cluster Formation and Evolution: On the Orion Nebula Cluster Kinematics*, Toulouse, France, 2022
- Talk (Remote): **Sloan Digital Sky Survey 2021 Collaboration Meeting**, *The stellar mass and 3D kinematics around the core of Orion Nebula Cluster* Baltimore, MD, 2021

TRAININGS AND WORKSHOPS

- **LSST Discovery Alliance Data Science Fellowship Program**, Northwestern University Evanston, IL, 2021–2023
- **Astronomical Software Development Workshop**, Center for Computational Astrophysics, Flatiron Institute New York, NY, 2022
- **Cross-disciplinary Scholars in Science and Technology Program**, Physics and Astronomy Department, University of California, Los Angeles Los Angeles, CA, 2018

TEACHING AND MENTORING

- **Teaching Assistant**: Phys 1A Lab (40 Students) & Phys 2A Lecturer (40 Students), UCSD 2019 – 2020
- **Undergraduate Mentoring**: Mentored two undergraduate students on the NIRSPA0 stellar spectra and JWST NIRCcam data reduction and modeling, UCSD 2024 – 2025

OUTREACH

- **The Pilina and Kōkua Initiative**: Volunteer in community acknowledgement event Waimea, HI, 2024
- **Local Organizing Committee**: Cambridge Workshops of Cool Stars, Stellar Systems and the Sun 22 (Cool Stars 22). University of California, San Diego La Jolla, CA, 2024