

MINGHAN CHEN

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Personal website: minghanchen.com \diamond Github: github.com/minghanmilan

SKILLS

Languages Python (pandas, scipy, numpy; object-oriented), SQL, C
Tools Git, Emacs, Mathematica, LaTeX
Mathematics Bayesian inference, MCMC, statistical modeling, PCA, calculus, image processing

EXPERIENCE

Graduate Researcher Sept 2018 - Present
University of California, Santa Barbara *Santa Barbara, CA*
*Worked on developing **pyKLIP**, an open-source data processing pipeline. Developed algorithms for precise astrometric measurements. Worked on measuring planet orbits and masses, simulating planet evolution and circumstellar disks. Has 8 scientific publications.*

- **Led the development of the CHARIS-pyKLIP Post-Processing Pipeline**, a python data processing pipeline widely used by the community to analyze imaging data of exoplanets. The pipeline reduces high contrast spectral-photometric images of planetary systems, extracts their positions and spectra to enable further scientific analysis of these systems.
- **Led the development** of image registration, spectral-photometric calibration, distortion correction, and a novel Expectation Maximization Principle Component Analysis algorithm for the Coronagraphic High Angular Resolution Imaging Spectrograph (CHARIS).
- **Developed the algorithm** to fit for accurate on-sky positions of blended sources, and measured the dynamical orbits of a planetary system, which produced **the most precise and accurate mass measurements ever** ($\sim 0.5\%$ precision) at the time of publication for all imaged brown dwarfs.
- Modeled brown dwarf evolution and provided important new insights on the physics of planet formation and cooling.
- **Led the spectral-imaging analysis** of the first ever simultaneous spectral-polarimetry imaging data of a proto-planetary disk, and **simulated the dust scattering physics to produce ray traced images**.

Student Researcher Oct 2015 - April 2018
Carnegie Mellon University *Pittsburgh, PA*

- **Trained a deep learning model using multi body simulation data and applied it** on the Coma Cluster to yield a precise mass estimate that aligned with physical models.
- Worked on imaging and spectroscopic surveys to detect galaxies using cross-correlation.

Summer Research Internship Jun 2017 - Aug 2017
École Polytechnique Fédérale de Lausanne (EPFL) *Lausanne, Switzerland*

- Worked with sparse signal processing and improved an algorithm that distinguishes different spectral energy distributions (SED) in multi-band images.

EDUCATION

University of California, Santa Barbara Expected Jun 2024
Ph.D. in Physics

University of California, Santa Barbara Feb 2021
Master's in Physics

Carnegie Mellon University 2014 - 2018
B.Sc. Physics, Dean's List High Honors, Science and Humanities Scholars Program