

CURRICULUM VITAE

CONTACT INFO **Xinyu (Cicero) Lu** Email: cicerolu@jhu.edu
3701 San Martin Dr, Baltimore, MD 21210

RESEARCH INTERESTS Studying **planet formation** through **debris disks** using spatially-resolved infrared spectroscopy and **exoplanets** demographics with big surveys.

EDUCATION **Ph.D. in Physics and Astronomy**, Johns Hopkins Expected 05/2023
M.A. in Physics and Astronomy, Johns Hopkins University 05/2019
B.S. in Physics, University of California, Los Angeles 06/2017

SELECTED RESEARCH EXPERIENCE **Sequencing Dusty Disk Spectra: discovering Relationships Between Disks and their Host Stars** JHU
Research Assistant, PI: Christine Chen 10/2021 - current
• A Non-Parametric, Systematic Analysis that is machine-learning based for analyzing debris disks's compositions and host star properties

Spatially-resolved Spectroscopy for debris disks JHU
Research Assistant, PI: Christine Chen 09/2019 - 09/2021
• Modeling full slit extraction and spatially-resolved spectra of the *IRS* β -Pic disk with various compositions, shape distributions and stoichiometry
• Corrected for the PSF and detector systematics such as fringing, RSRF
• Applying MCMC and Particle Swarm Optimization

Small planet occurrence around late-type dwarfs in *Kepler* JHU
Research Assistant, PI: Kevin Schlaufman 09/2017 - 05/2019
• Calculate small planet occurrence with KeplerPORTS with *Kepler* DR25
• Our calculated planet formation efficiency prefers planetesimal accretion

Supernova Kicks in Hierarchical Triple System UCLA
Undergraduate Researcher, PI: Smadar Naoz 11/2014 - 05/2018
• Computed constraints on maximum SN kicks to disrupt a triple
• Predicted the post SN survival rate of BH-Neutron Star-Stellar companion triple system and Gravitational Wave timescale for BH-BH Stellar companion triple system

Gravitational Lensing UCLA
Research Assistant, PI: Tommaso Treu 07/2016 - Present
• Compile and manage an online database of lensed quasars for STRIDES collaboration
• Attended NIRC2 remote observation on Keck telescope and assisted by reducing 2D raw image data

- Wrote a python script to estimate the theoretical range of brightness of host galaxy given separation of lensed quasar images

PUBLICATIONS **Lu, C. X.**, Chen, C.H., Sargent, B. A., Watson D.M., Lisse C. M., Green J. D., Sitko M., Mittal T., Rebollido I., Hines D.C., Werner M. W., Stapelfeldt K.R. “Silicates in the β Pictoris disk: Discovery of new silicate features through the *Spitzer IRS* data and its implications”, 2021, under review

Lu, C. X., Schlaufman, K.C. and Cheng, S. “Small Planet Occurrence Increases with Metallicity for Late-type Dwarf Stars in the Kepler Field and Its Implications for Planet Formation”, [AJ](#), **160**, 253

Lu, C. X. and Naoz, S. “Supernova Kicks in Hierarchical Triple Body Systems”, [MNRAS](#), **484**, 1506

Kilpatrick, C D.; Foley, R. J.; Abramson, L. E.; Pan, Y.; **Lu, C. X.** et al. “ On the Progenitor of the Type IIb Supernova 2016gkg”, [MNRAS](#), **465**, 4650

**SELECTED
HONORS &
AWARDS**

[NASA Earth and Space Science and Technology Future Investigator Fellowship](#) 09/2021-08/2023
[Chambliss Astronomy Achievement Student Award Competition for graduate students Honorable Mention](#), AAS 236, June 1-3, 2020
UCLA Undergraduate Research Scholars Program Scholarship: Awarded Scholarship by Van Tree Foundation, Sept. 2016 - July 2017
UCLA Honors 2015 Summer Research Scholarship Recipient: Awarded Stone Scholarship fund for research, Jun. 2015 - Sept. 2015

**SELECTED
ORAL
PRESENTATION**

Contributed Talk “*The silicates in the beta Pictoris Debris Disk*”, European Astronomical Society Annual Meeting, June 28th - July 2nd, 2021

Contributed Talk “*Probing Planet Formation with Planet Occurrence as a Function of Metallicity*”, Cheaspeake Bay Area Exoplanet Meeting (CHEXO), Dec. 11th, 2020 [[Slides](#)]

Contributed Talk, “*New Discoveries in β Pictoris Debris Disk with the Spitzer IRS Spectra*”, STScI Star and Planet Formation Research Group Meeting, Aug. 12th, 2020

Invited Talk, “*Multiple Views of Planet Formation*”, UCLA Smadar Naoz Research Group Meeting, June 18th, 2020

**SELECTED
POSTER
PRESENTATION**

Constraining the Role of Collisions in the β Pictoris Debris Disk, AAS

237, online, Jan 11–15, 2021 [[Poster](#)]

Constraining the Role of Collisions in the β Pictoris Debris Disk, *AAS 236*, online, June 1–3, 2020 [[Poster](#)]

M Dwarf Planet Occurrence Rates Depend on Metallicity at all Planet Radii , *Extreme Solar System IV*, Reykjavik, Iceland, Aug. 2019

Supernova Kicks in Hierarchical Triple Systems, *IAU 353 Galactic Dynamics in the Era of Large Surveys*, Shanghai, China, Jun. 2019

**SUCCESSFUL
PROPOSALS &
GRANTS**

NASA Earth and Space Science and Technology Future Investigator Fellowship, *Sequencing Dusty Disk Spectra: A Non-Parametric, Systematic Analysis Revealing the Relationships Between Disks and their Host Stars*, PI: C. Chen, FI: **C. Lu**

James Webb Space Telescope Cycle Guest Observer Program, *Search for NIR gas in debris disks. Is there a water delivery mechanism?*, PI: I. Rebollido, Co-Is: C. Chen, J. Debes, **C. Lu**, A. Moro-Martin, M. Perrin, A. Roberge

STScI Director’s Research Fund, *Does Fomalhaut Have an Icy Kuiper Belt?*, **Co-I** (Lu wrote the Science Justification for this proposal.), 20 November 2020 – 31 December 2021

STScI Director’s Research Fund, *Silicate Mapping in Debris Disks*, **Co-I**, 1 November 2019 – 31 January 2021

Spitzer Director’s Discretionary Time, *The First Young Transiting Planet: Exoplanet or Starspot*, **Co-I** (Science PI), Approved by Reviewer, not executed due to target duplication in queue, 2019

IAU Travel Grant for IAU Symposium No. 353, April 2nd, 2019

**Professional
Memberships**

American Astronomical Society Member
American Physical Society Member

2019-present
2015-2017, 2021