

XINYUE LIANG

Xiamen University
Siming District, Xiamen, Fujian, P.R. China

liangxy@stu.xmu.edu

<https://lxyapp177.github.io/>

Education

Xiamen University	Sep. 2021- Expected 2024
Graduate Student, Department of Astronomy	Xiamen, CN
Xiamen University	Sep. 2017 - Jun. 2021
Bachelor of Science	Xiamen, CN
• Thesis advisor: Advisors: Prof. Zheng Zhen-Ya , Prof. Taotao Fang	
• Thesis title: The Optical and X-ray Signatures of Supermassive Black Hole Binary	

Research Interests

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- Galaxy formation and evolution.
 - Quantitative galaxy morphology.
 - Cosmic evolution of disk structure
 - Galaxy-galaxy interaction

Research Experience

How robust can we identify and quantify stellar bars using JWST observations? Feb 2023 – Present
Advisors: [Prof. Taotao Fang](#), [Prof. Luis C. Ho](#), [Dr. Si-Yue Yu](#) *Paper in prep*

- We use three categories of simulated images to investigate how the limitations of observations can impact the identification and measurements of bars, specifically under the JWST CEERS observation conditions.
- Find that bar identification and measurements are greatly affected by resolution but only slightly influenced by noise. Moreover, at $z = 3.0$, approximately 50% of barred galaxies may go undetected due to observational limitations.
- Additionally, we have developed functions to correct the observational biases measuring bar properties.

On the Principal Component Analysis of Surface Density Profiles Step. 2021 – May. 2022

Advisors: [Prof. Taotao Fang](#), [Prof. Luis C. Ho](#), [Dr. Si-Yue Yu](#)

- We apply the principal component analysis (PCA) to the surface density profiles (SDPs) of the galaxies from the *Spitzer* Survey of Stellar Structure in Galaxies (S^4G).
- Find that the result of PCA is related to the shape of the SDPs, and can be used to quantify the contribution of bulge component.
- As a result, We define a new bulge type indicator, which turns out to be well consistent with the transitional bulge indicator $\Delta\langle\mu_e\rangle$.

The properties of barred galaxies in TNG50

June 2022 – Present

Advisors: [Prof. Taotao Fang](#), [Prof. Luis C. Ho](#), [Dr. Si-Yue Yu](#)

- In this work, we aim to quantify the properties of barred galaxies using the mock images of TNG50 and compare them to the observations.
- We identify the barred galaxies by ellipse fitting, which is common used in observation work.
- Currently we have measured the semi-major axis and ellipticity of the bars both in TNG50 and DESI and are going to compare them quantitatively in the next step.

Specialized Skills

Programming Language: Python (Experienced), C, Shell

Software and Packages: Photutils, Imfit, TOPCAT, Statmorph, AutoProf, CIAO, HEAsoft

Teaching Experience

Observational Astrophysics

Teaching assistant

2022 Spring

Awards & Honors

Undergraduate Research and Training Program Grant, Chinese Academy of Sciences

Shanghai Astronomical Observatory, Chinese Academy of Sciences

2019

Guangqi Scholarship of Shanghai Astronomical Observatory

Shanghai Astronomical Observatory, Chinese Academy of Sciences

2019, 2020

National Astronomical Observatory Scholarship

National Astronomical Observatories, Chinese Academy of Sciences

2020