Astronomy Special Seminar

Dr. Yisheng Qiu

(邱逸盛)

Zhejiang Laboratory

Starduster: a multi-wavelength SED model based on radiative transfer simulations and deep learning

Time: 14:15-14:40, 18 June (Tuesday), Shanghai time

Venue： N601（TDLI）

Host: Yosuke Mizuno

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Meeting ID: 244698633 (Password:123456)

Abstract:

Estimating dust attenuation and emission is a time consuming task in modeling galaxy SEDs when using dust radiative transfer simulations. However, dust radiative transfer simulations provide a more realistic and fundamental way to predict dust effects, which allows to parameterize SEDs using geometry parameters. In this talk, I will introduce a method based on supervised deep learning to emulate dust radiative transfer simulations. We propose two specific neural networks which fully take into account the features of dust attenuation curves and dust emission spectra. Our deep learning model achieves high accuracy using about 5,000 samples and provides ~ 1,000 times acceleration. I will also present an application of our model, which investigates whether galaxy geometry parameters can be constrained using observed SEDs. Our results suggest the typical scale of dust and stellar disks can be constrained. Our code is publicly available on Github.

Biography:

Dr. Yisheng Qiu (邱逸盛) earned his PhD from the University of Melbourne (2017-2020), specializing in galaxy formation simulations during the epoch of reionization. During his postdoctoral tenure at Zhejiang University (2021-2023), he expanded his expertise to encompass galaxy SED modeling, radiative transfer simulations, and deep learning. Since 2023, Dr. Qiu has been with Zhejiang Lab, where his research focuses on molecular line fitting and deep learning.