Yueying Ni

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Education

Carnegie Mellon University — Pittsburgh, PA
Ph.D. in Physics — *Sep. 2017 – present*

Fudan University — Shanghai, China
B.S. in Physics — *Sep. 2013 – June 2017*

Research Interests

High-z galaxies and quasars: cosmological hydrodynamic simulations, sub-grid models, constrained Gaussian realizations

Deep Learning: Super-resolution simulations

Alternative dark matter: astrophysical probes of Fuzzy Dark Matter (FDM) model

Works in progress

Asterix Simulation

- A new large-volume cosmological hydrodynamic simulation to study the epoch of re-ionization as well as the formation of galaxy and quasars at $z > 2$.
- Provide a training suite of cosmological hydro simulation for super resolution models

Super resolution simulation

- Use super resolution generative models to generate high-resolution realizations conditioned on low-resolution simulation outputs.
- Apply the technique to hydro-simulations.

Early quasar growth

- Use constrained Gaussian realization technique to constrain the properties of the initial density fields for cosmological simulations, and probe the relation between the initial density peaks and the growth of most massive super massive black holes in cosmological simulations.

Publications

First Author Papers

Y. Ni, T. Di Matteo and Y. Feng, *Not all peaks are created equal: the early growth of Supermassive Black Holes*, *arXiv e-prints* (2020) arXiv:2012.04714 [2012.04714]

Y. Ni, T. Di Matteo, R. Gilli, R. A. C. Croft, Y. Feng and C. Norman, *QSO obscuration at high redshift (z ¿ 7): predictions from the BLUETIDES simulation*, MNRAS **495** (2020) 2135 [1912.03780]

Y. Ni, M.-Y. Wang, Y. Feng and T. Di Matteo, *Predictions for the abundance of high-redshift galaxies in a fuzzy dark matter universe*, MNRAS **488** (2019) 5551 [1904.01604]

Y. Ni, T. Di Matteo, Y. Feng, R. A. C. Croft and A. Tenneti, *Gas outflows from the z = 7.54 quasar: predictions from the BLUETIDES simulation*, MNRAS **481** (2018) 4877 [1806.00184]

Y. Ni, J. Jiang and C. Bambi, *Testing the Kerr metric with the iron line and the KRZ parametrization*, J. Cosmology Astropart. Phys. **2016** (2016) 014 [1607.04893]

Y. Ni, M. Zhou, A. Cárdenas-Avendaño, C. Bambi, C. A. R. Herdeiro and E. Radu, *Iron Kα line of Kerr black holes with scalar hair*, J. Cosmology Astropart. Phys. **2016** (2016) 049 [1606.04654]

Second Author Papers

Y. Li, **Y. Ni**, R. A. C. Croft, T. Di Matteo, S. Bird and Y. Feng, *AI-assisted super-resolution cosmological simulations*, *arXiv e-prints* (2020) arXiv:2010.06608 [2010.06608]

M. A. Marshall, **Y. Ni**, T. Di Matteo, J. S. B. Wyithe, S. Wilkins, R. A. C. Croft et al., *The host galaxies of $z = 7$ quasars: predictions from the BLUETIDES simulation*, MNRAS **499** (2020) 3819 [1912.03428]

K.-W. Huang, **Y. Ni**, Y. Feng and T. Di Matteo, *The early growth of supermassive black holes in cosmological hydrodynamic simulations with constrained Gaussian realizations*, MNRAS **496** (2020) 1 [1906.00242]

Selected Talks

BlueWater Symposium June 2019
Talk: BlueTides simulation: first galaxies and QSOs at the cosmic dawn *Sunriver,OR*

Big eye in the early universe January 2019
Talk: High-z quasar outflows and obscuration *Los Angeles,CA*

Teachings

- 33-141 Physics I for Engineering Students, *Spring 2019*
- 33-104 Experimental Physics, *Fall 2018*
- 33-152 Matter and Interaction II, *Spring 2018*
- 33-121 Physics I for Science Students, *Fall 2017*