

Yunchong Wang

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EDUCATION

TSINGHUA UNIVERSITY | BACHELOR OF SCIENCE IN PHYSICS

Sep 2015 - Jul 2019 | Overall GPA: 3.72/4.00

Advanced astrophysical courses: Galactic Dynamics • Physical Cosmology • General Relativity • Applications of General Relativity • Astrophysics • Stellar Physics • Astrophysics graduate student seminar

• Thesis advisors: Shude Mao, Dandan Xu

STANFORD UNIVERSITY | PH.D. CANDIDATE IN PHYSICS

Sep 2019 - Present | Thesis advisor: Risa Wechsler | Dissertation committee members: Tom Abel, Susan Clark

PUBLICATIONS

EARLY-TYPE GALAXY DENSITY PROFILES FROM ILLUSTRISTNG: I. GALAXY CORRELATIONS AND THE IMPACT OF BARYONS. | PUBLISHED IN MNRAS

Yunchong Wang, Mark Vogelsberger, Dandan Xu, Shude Mao, Volker Springel, Hui Li, David Barnes, Lars Hernquist, Annalisa Pillepich, Federico Marinacci, Ruediger Pakmor, Rainer Weinberger, Paul Torrey

(<https://doi.org/10.1093/mnras/stz3348>)

EARLY-TYPE GALAXY DENSITY PROFILES FROM ILLUSTRISTNG: II. EVOLUTIONARY TREND OF THE TOTAL DENSITY PROFILE | PUBLISHED IN MNRAS

Yunchong Wang, Mark Vogelsberger, Dandan Xu, Xuejian Shen, Shude Mao, David Barnes, Hui Li, Federico Marinacci, Paul Torrey, Volker Springel, Lars Hernquist

(<https://doi.org/10.1093/mnras/stz2907>)

UNIVERSEMACHINE: PREDICTING GALAXY STAR FORMATION OVER SEVEN DECADES OF HALO MASS WITH ZOOM-IN SIMULATIONS | PUBLISHED IN APJ

Yunchong Wang, Ethan O. Nadler, Yao-Yuan Mao, Susmita Adhikari, Risa H. Wechsler, Peter Behroozi

(<https://dx.doi.org/10.3847/1538-4357/ac024a>)

EARLY-TYPE GALAXY DENSITY PROFILES FROM ILLUSTRISTNG: III. EFFECTS ON OUTER KINEMATIC STRUCTURE | PUBLISHED IN MNRAS

Yunchong Wang, Shude Mao, Mark Vogelsberger, Volker Springel, Lars Hernquist, Risa Wechsler

(<https://doi.org/10.1093/mnras/stac1375>)

DETECTION OF SPATIAL CLUSTERING IN THE 1000 RICHEST SDSS DR8 REDMAPPER CLUSTERS WITH NEAREST NEIGHBOR DISTRIBUTIONS | PUBLISHED IN MNRAS

Yunchong Wang, Arka Banerjee, Tom Abel

(<https://doi.org/10.1093/mnras/stac1551>)

SDSS-IV MANGA : THE INNER DENSITY SLOPES OF NEARBY GALAXIES | PUBLISHED IN MNRAS

Ran Li, Hongyu Li, Shi Shao, Shengdong Lu, Kai Zhu, Chunxiang Wang, Liang Gao, Shude Mao, Aaron A. Dutton, Junqiang Ge, Yunchong Wang, Alexie Leauthaud, Zheng Zheng, Kevin Bundy, Joel R. Brownstein

(<https://doi.org/10.1093/mnras/stz2565>)

REDSHIFT EVOLUTION OF THE FUNDAMENTAL PLANE RELATION IN THE ILLUSTRISTNG SIMULATION | PUBLISHED IN MNRAS

Shengdong Lu, Dandan Xu, Yunchong Wang, Shude Mao, Junqiang Ge, Volker Springel, Yuan Wang, Mark Vogelsberger, Jill Naiman, Lars Hernquist

(<https://doi.org/10.1093/mnras/staa173>)

STAR FORMATION IN MASSIVE GALAXIES AT REDSHIFT $z \sim 0.5$ | PUBLISHED IN APJ

Kun Xu, Chengze Liu, Yipeng Jing, Yunchong Wang, Shengdong Lu

(<https://doi.org/10.3847/1538-4357/ab8fa0>)

HOT AND COUNTER-ROTATING STAR-FORMING DISK GALAXIES IN ILLUSTRISTNG AND THEIR REAL-WORLD COUNTERPARTS | PUBLISHED IN MNRAS

Shengdong Lu, Dandan Xu, [Yunchong Wang](#), Yanmei Chen, Ling Zhu, Shude Mao, Volker Springel, Jing Wang, Mark Vogelsberger, Lars Hernquist
(<https://doi.org/10.1093/mnras/stab497>)

QUENCHED, BULGE-DOMINATED, BUT DYNAMICALLY COLD GALAXIES IN ILLUSTRISTNG AND THEIR REAL-WORLD COUNTERPARTS | PUBLISHED IN MNRAS

Shengdong Lu, Dandan Xu, Sen Wang, [Yunchong Wang](#), Shude Mao, Xiaoyang Xia, Mark Vogelsberger, Lars Hernquist
(<https://doi.org/10.1093/mnras/stab3228>)

BARYONIC EFFECTS ON LAGRANGIAN CLUSTERING AND ANGULAR MOMENTUM RECONSTRUCTION | SUBMITTED TO APJ

Ming-Jie Sheng, Hao-Ran Yu, Sijia Li, Shihong Liao, Min Du, [Yunchong Wang](#), Peng Wang, Kun Xu, Shy Genel, Dimitrios Irodotou
(<https://arxiv.org/abs/2210.04203>)

SYMPHONY: COSMOLOGICAL ZOOM-IN SIMULATION SUITES OVER FOUR DECADES OF HOST HALO MASS | SUBMITTED TO APJ

Ethan O.Nadler, Philip Mansfield, [Yunchong Wang](#), Xiaolong Du, Susmita Adhikari, Arka Banerjee, Andrew Benson, Elise Darragh-Ford, Yao-Yuan Mao, Sebastian Wagner-Carena, Risa H. Wechsler, Hao-Yi Wu
(<https://arxiv.org/abs/2209.02675>)

PROPOSAL GRANTS

HUBBLE SPACE TELESCOPE CYCLE 30 THEORY AR PROPOSAL | GALAXY-HALO CONNECTION FROM RESOLVED STAR FORMATION HISTORIES OF DWARF GALAXIES
Cycle 30 Program HST-AR-170, Nov 2022 - Nov 2023

XSEDE (ACCESS) XRAC PROPOSAL | COSMOLOGICAL ZOOM-IN SIMULATIONS OF MILKY WAY-LIKE SYSTEMS WITH EMBEDDED GALACTIC DISKS
TG-PHY210112, Jan 2022 - Dec 2022

HONORS AND AWARDS

GREGORY AND MARY CHABOLLA FELLOWSHIP | STANFORD SCHOOL OF HUMANITIES AND SCIENCES
Sept 2019 - Aug 2021

PAUL KIRKPATRICK AWARD | STANFORD PHYSICS DEPARTMENT OUTSTANDING TEACHING ASSISTANT
Aug 2022 (TA for Physics 100/301, UG/Grad Observational Astronomy)

LINBRIDGE SCHOLARSHIP | TSINGHUA UNDERGRADUATE HIGHEST HONOR FOR ASTROPHYSICS RESEARCH
Nov 2018

TSINGHUA-CNPC SCHOLARSHIP | AWARD OF ALL-ROUND EXCELLENCE
Nov 2018

NATIONAL ASTRONOMICAL OBSERVATORY OF CHINA SCHOLARSHIP | AWARD OF ACADEMIC EXCELLENCE IN ASTRONOMY AND ASTROPHYSICS
Nov 2018

TSINGHUA XUETANG TALENTS PROGRAM | FELLOWSHIP PROGRAM IN PHYSICS
Sep 2017 – July 2019

TSINGHUA UNIVERSITY SCHOLARSHIP | AWARD OF SOCIAL WORK EXCELLENCE
Oct 2016

RESEARCH EXPERIENCE

TSINGHUA UNDERGRADUATE SEMINAR | SUPERVISED BY PROFESSOR SHUDE MAO
Mar 2017 – Mar 2019 | Beijing, China

- BOSS emission-galaxy strong lensing probability estimation.
- Illustris simulations power-law bias on strong lensing galaxy convergence profiles.

TSINGHUA UNDERGRADUATE THESIS | SUPERVISED BY PROFESSORS SHUDE MAO AND DANDAN XU

Mar 2019 – Jul 2019 | Beijing, China

- Galaxy dynamical structure's link to its density profiles and environment.
- Comparison of Jeans-anisotropic MGE method performance on IllustrisTNG and MaNGA early-type galaxies.

LEIDEN OBSERVATORY LEAPS PROGRAM | SUPERVISED BY PROFESSOR HENK HOEKSTRA

Jul 2017 - Sep 2017 | Leiden, Netherlands

- Quantifying the mis-centering effect of BCGs from cluster halo centers using simulated weak-lensing clusters in the Cluster-EAGLE project.

MIT KAVLI INSTITUTE CSGF GROUP | SUPERVISED BY PROFESSOR MARK VOGELSBERGER

Jul 2018 – Sept 2018 | Cambridge, MA

- The correlation of the density profile with galaxy properties and the impact of baryons on the density slope in early-type galaxies from the IllustrisTNG Simulations. Paper published in MNRAS.
- The evolutionary trends of the density profile and the effects from mergers and AGN feedback in the formation of isothermal density profiles in the IllustrisTNG Simulations. Paper published in MNRAS.

CONFERENCES

IAU SYMPOSIUM 353 | GALACTIC DYNAMICS IN THE ERA OF LARGE SURVEYS

Poster presentation: Early-type Galaxies Density Profiles in IllustrisTNG | Shanghai, Jul 2019

10TH CHINA-MANGA WORKSHOP | SDSS IV-MANGA COLLABORATION MEETING

Talk: IllustrisTNG Simulations and the comparison with MaNGA | Tsinghua University, Beijing, Dec 2019

TALKS

HARVARD CFA | LARS HERNQUIST GROUP MEETING PRESENTATION

Early-Type Galaxy Density Profiles from IllustrisTNG | Sep 2018

HITS | VOLKER SPRINGEL GROUP MEETING PRESENTATION

Systematics in Macro-Lens Modeling and its Impact on Cosmology | Sep 2017

FLATIRON INSTITUTE CCA | GALAXY FORMATION GROUP MEETING TALK

Density Profile Evolution in Early-type Galaxies | Apr 2019

UniverseMachine in zoom-in simulations | Oct 2021

STANFORD KIPAC | KIPAC TEA TALK

UniverseMachine in Milky-Way zoom-ins | Jun 2021

Detection of spatial clustering in the 1000 richest SDSS DR8 redMaPPer clusters with Nearest Neighbor distributions | Jul 2022

THCA | XUENING BAI PLANET-FORMATION GROUP MEETING PRESENTATION

Imaging Extrasolar Giant Planets | Dec 2017

Tides, Rotation and Shape | May 2018

THCA | GRADUATE STUDENT SEMINAR

The Large Synoptic Survey Telescope | Mar 2018

The European-Extremely Large Telescope | Dec 2018

Galactic Dynamo: Feedback, Scaling Relations, and Observational Prospects | May 2019

UNIVERSITY OF CHICAGO | GALAXY FORMATION GROUP MEETING

UniverseMachine: Predicting galaxy star formation over 7 decades of halo mass with zoom-in simulations | Feb 2021

Detection of spatial clustering in the 1000 richest SDSS DR8 redMaPPer clusters with Nearest Neighbor distributions | Feb 2022

TEACHING AND MENTORING

TEACHING ASSISTANT | STANFORD PHYSICS DEPARTMENT

Sep 2019 - present

- Physics 43, Electricity and Magnetism; Spring 2020
- Physics 16, The Origin and Development of the Cosmos; Winter 2021
- Physics 100 (undergrad lab)/301 (grad lab), Introduction to Observational Astrophysics; Spring 2022

STUDENT MENTEE

Kihana Wilson, University of Chicago. July 2022 - Sep 2022

- The impact of LMC infall times on the Milky-Way subhalo population in zoom-in simulations
- Leadership Alliance Summer Research Early Identification Program

OUTREACH

KIPAC OUTREACH | STANFORD PHYSICS DEPARTMENT

Sep 2019 - present

- Moderator for Astronomy on Tap, San Francisco
- Stanford Physics Inclusion and Equity (PIE) program volunteer mentor (offering under-represented background students preparation guide for Physics PhD applications)
- Stanford Student Observatory Certified Operator
- Moderator for KIPAC public lecture series

MEMBER | STANFORD ASTRONOMICAL SOCIETY

Apr 2020 - present

- Virtual Stargazing Event host (lecturer on the "Messier Marathon")

CHAIR | TSINGHUA ASTRONOMY SOCIETY

Sep 2017 - Sep 2018

- Founder of the Tsinghua Observatory Public Night, hosting 1000+ visitors per year.
- Co-founder of the Tsinghua Astronomy Night, observing multiple targets including planets, galaxies, nebular and star clusters simultaneously with 8-10 telescopes, hosting 500+ visitors per venue.
- Led observation trips with 80+ people outside Beijing (including to LAMOST)
- Hosted bi-weekly sidewalk stargazing, telescope instruction, and amateur observation saloons.
- Worked in support for organizing the Tsinghua University 'New Worlds, New Horizons' scientific public talk series.

CHINA NATIONAL RADIO SHOW | LECTURE GUEST

Invited for two talks on Hawking's black hole theory | Apr 2018

TENCENT NEWS SCIENCE SHOW | WEB BROADCAST GUEST

Invited for live meteor showers, astrophotography, and super-moon shows | 2016-2017

SKILL SET

PROGRAMMING AND TOOLS

Advanced:

Python • C/C++ • Linux • \LaTeX • Vi/Vim • ffmpeg

Proficient:

Mathematica • SAOImage DS9 • Maxim DL • TheSky6 • Tensorflow

Familiar:

Splash • Network X • Geant4 • ROOT Analysis • YT

TEST SCORES

GRE Physics Subject:

990 / 990 (94%)

GRE General:

Verbal: 165 / 170 (96%)

Quantitative: 170 / 170 (96%)

Analytic Writing: 4.0 / 6.0 (59%)

TOEFL iBT:

119 / 120 (Speaking 30 / 30)