Sihao Cheng (程思浩)

Curriculum Vitae / August, 2021

Bloomberg 506
Department of Physics and Astronomy
Johns Hopkins University
3400 N Charles Street, Baltimore, MD 21218, USA

s.cheng@jhu.edu
https://sihaocheng.github.io
+1-443-207-1532
ORCID: 0000-0002-9156-7461

EDUCATION

Ph.D. & M.A., Physics and Astronomy — 2017–2021
Johns Hopkins University, United States advisor: Brice Ménard

B.Sc. (with Honors), Astronomy — 2012–2016
Peking University, China advisor: Eric W. Peng

RESEARCH INTEREST

I am interested in using statistical analysis of large data set to obtain more understanding of our Universe, including topics in observational cosmology, stellar physics, and extrasolar planets. I am mainly working on two topics now: 1. a powerful new statistic borrowing ideas from convolutional neural nets and its applications in various disciplines; 2. white dwarfs, including their evolution, merger, and planets around them.

AWARDS

2020 Outstanding Publication in Astrostatistics Award — Jan 2021
IAU travel grant for Symposium No.357 — Oct 2019
Lin-Qiao Prize for Undergraduate Research at Peking University — Sept 2015
Wu-Si Scholarship — May 2014, May 2015

PUBLICATIONS

Weak lensing scattering transform: dark energy and neutrino mass sensitivity
Visualised what the scattering transform sees from a lensing mass map, and emphasised its advantage of having Gaussian likelihood
Sihao Cheng and Brice Ménard
2021, *MNRAS*, 507, 1012

Forever young white dwarfs: when stellar ageing stops
Camisassa, M. **et al.**
2021, *A&A Letters*, 649, 7

A new approach to observational cosmology using the scattering transform
Introduced a new statistic inspired by convolutional neural nets to observational cosmology, and demonstrated that it outperforms classic estimators
Sihao Cheng, Yuan-Sen Ting, Brice Ménard, and Joan Bruna
2020, *MNRAS*, 499, 5902

An Increase in Small-planet Occurrence with Metallicity for Late-type Dwarf Stars in the Kepler Field and Its Implications for Planet Formation
Cicero X. Lu, Kevin C. Schlaufman, and **Sihao Cheng**
2020, *AJ*, 160, 253

Multi-Gigayear White Dwarf Cooling Delays from Clustering-Enhanced Gravitational Sedimentation
Evan B. Bauer, Josiah Schwab, Lars Bildsten, and **Sihao Cheng**
2020, *ApJ*, 902, 93

A Gravitational Redshift Measurement of the White Dwarf Mass–Radius Relation
Used populational gravitational redshift to probe the white dwarf mass–radius relation over a wide mass range
Vedant Chandra, Hsiang-Chih Hwang, Nadia L. Zakamska, and **Sihao Cheng**
2020, *ApJ*, 899, 146

Carbon star formation as seen through the non-monotonic initial–final mass relation
Marigo, P. **et al.**
2020, *Nature Astronomy*

Double White Dwarf Merger Products among High-mass White Dwarfs
Measured the white dwarf merger rate with unprecedented high precision using a novel kinematic method
Sihao Cheng, Jeffrey D. Cummings, Brice Ménard, and Silvia Toonen
2020, *ApJ*, 891, 160

Two delays in white dwarf evolution revealed by *Gaia*
Sihao Cheng
2019, *Proceedings of IAU*, 15 (S357), 175

A Cooling Anomaly of High-mass White Dwarfs
Discovered an unexpected, extremely long cooling delay in a population of white dwarfs using Gaia data
Sihao Cheng, Jeffrey D. Cummings, and Brice Ménard
2019, *ApJ*, 886, 100

Meteor spectral observation with DSLR, normal lens and prism
Sihao Cheng and Simiao Cheng
2011, *JIMO*, 39, 39

TALKS & PRESENTATIONS

Contributed Talk, *Learn the Universe – an ML X Cosmology Workshop*, New York city, NY	Aug 2021
HotSci Seminar at STScI	July 2021
Cosmology group meeting at Ohio State University	July 2021
Science coffee at STScI	July 2021
LSST DESC telecon	Jun 2021
Poster, *Statistical Challenges in Modern Astronomy VII*, online	Jun 2021
Poster, *Where the Earth Meets the Sky*, online	May 2021
Seminar at the German Center for Cosmological Lensing	May 2021
Cosmology group meeting at University of Edinburgh	May 2021
Seminar at Shanghai Jiao Tong University	Apr 2021
Invited Talk, *White Dwarfs from Physics to Astrophysics*, KITP	Mar 2021
Cosmology group meeting at Harvard University	Mar 2021
Lunch talk at Peking University	Mar 2021
Seminar at Tsinghua University	Mar 2021
Colloquium (with Brice Meńard) at University of British Columbia	Mar 2021
Cosmology group meeting at Leiden	Jan 2021
Cosmology seminar at IPMU	Jan 2021
Cosmology seminar at IAP	Dec 2020
Lunch talk at University of Virginia/NRAO	Nov 2020
Euclid US telecon	Nov 2020
Cosmology/machine learning journal club at Fermilab	Oct 2020
Seminar at DIRAC, University of Washington	Oct 2020

(invited) Cosmology seminar at Duke University — Oct 2020
Seminar at Columbia University — Oct 2020
Astrophysics and Cosmology Seminar at University of Arizona — Sep 2020
Wine & Cheese seminar at Johns Hopkins University — Sep 2020
Cosmology journal club at University of Oxford — Sep 2020
Euclid Modelling working group — Sep 2020
Astrocoffee at Weizmann Institute of Science — Aug 2020
Contributed Talk, *Cosmology from Home* — Aug 2020
LSST DESC weak lensing mass mapping working group — Aug 2020
Astrophysics/Cosmology Seminar at University of Sussex — July 2020
Compact object journal club, STScI, Baltimore, MD — Apr 2020
Lunch Seminar at Indiana University, Bloomington, IN — Mar 2020
CTC seminar at University of Maryland, College Park, MD — Mar 2020
Thunch seminar at Princeton University and astro-coffee at IAS, Princeton, NJ — Feb 2020
A special seminar at Boston University, Boston, MA — Feb 2020
(invited) The Stars & Planets Seminar at Harvard-Smithsonian CfA, Cambridge, MA — Feb 2020
Contributed Talk, *White Dwarfs as Probes of Fundamental Physics and Tracers of Planetary, Stellar, and Galactic Evolution*, Hilo, HI (IAU grant awarded for travel) — Oct 2019
Contributed Talk, *The Beginnings and Ends of Double White Dwarfs*, Copenhagen, Denmark (grant awarded for travel) — July 2019
Poster, 2019 STScI Spring Symposium: *The Deaths and Afterlives of Stars*, Baltimore, MD — Apr 2019

TEACHING EXPERIENCE

Teaching assistant, Johns Hopkins University, Stars & the Universe — 2019
Teaching assistant, Johns Hopkins University, Physics I & II — 2017–2018

REFERENCES

Prof. Brice Ménard — menard@jhu.edu
Johns Hopkins University — 1-443-345-6791

Prof. Marc Kamionkowski — kamion@jhu.edu
Johns Hopkins University — 1-410-516-0373

Prof. Nadia L. Zakamska — zakamska@jhu.edu
Johns Hopkins University — 1-410-516-6657

Prof. Yuan-Sen Ting — ting@ias.edu
Australian National University