

KEVIN SPENCER McCARTHY

HOME INSTITUTION

California Institute of Technology
Infrared Processing & Analysis Center
kevmac@ipac.caltech.edu

PERMANENT ADDRESS

Pasadena, CA 91103
(904) 728-1055

EDUCATION

University of Utah

August 2015-May 2021

Doctor of Philosophy, Physics, GPA: 3.95

Thesis Title: Improving Cosmological Growth-Rate Constraints with Galaxy Clustering

Thesis Advisor: Zheng Zheng

University of North Florida

May 2015

Bachelor of Science, Physics, Summa Cum Laude

Florida State University

December 2008

Bachelor of Science, Marketing

RESEARCH EXPERIENCE

Research Assistant: Observational Cosmology

May 2016 – 2021

University of Utah, Advisor: Dr. Zheng Zheng

Performed computational measurements on the effects of dark matter halo assembly history on galaxy clustering in redshift space so as to reduce systematic uncertainties in modeling the galaxy-halo connection to infer cosmological parameters.

Laboratory Supervisor: Fiber-Fed Student Spectrograph Construction

January – July 2015

University of North Florida, Advisor: Dr. Jane MacGibbon, <https://tinyurl.com/yxebabj7>

Research Assistant: Stellar Evolution

May – August 2014

University of North Florida, Advisor: Dr. Jane MacGibbon

Research Assistant: Computational Neuroscience

May – August 2013

University of North Florida, Advisor: Dr. John Anderson

GRANTS AND AWARDS

Senior Astronomy Graduate Student Grant: \$11500	2019
First-Year Astronomy Graduate Research Grant: \$6000	2016
Outstanding Graduate TA Award: \$3000	2015

COMPUTER SKILLS @KevinMacAstro

Python. C. Microsoft Office. LaTeX. TensorFlow. Keras. Data mining techniques such as: Gaussian processes, artificial neural networks, singular-value decomposition and principal component analysis, Monte Carlo Markov Chain, and maximum log-likelihood analysis. Adobe XD. Adobe Dreamweaver. HTML.

PUBLIC OUTREACH

- Lunar Eclipse Stargazing Event, South Physics Observatory, January 2019, Salt Lake City, UT
- Astronomy Festival, Bryce Canyon National, June 2017, Bryce, UT
- Science Day at the U., South Physics Observatory Assistant, 2016 October, Salt Lake City, UT
- Astronomy Presentation for Girl Scout Troop 660, 2015 March, Callahan, FL
- Astronomy Information Table at Durbin Creek Elementary Space Night, 2015 February, St. Johns, FL

ORGANIZATIONAL ROLES

- Workspace Renovation Coordinator**, *University of Utah* 2018-2020
Proposed an open work space renovation of the astronomy undergraduate/graduate/faculty offices to Dept. of Physics/Astronomy Chair and University of Utah building administrators. The plan was brought to university architects and the renovation was completed in the summer of 2020.
- Astronomy Club President**, *University of North Florida*, Elected Position 2014-2015

CONFERENCE PRESENTATIONS AND POSTERS

Presentations

- The Galaxy-Halo Connection Across Cosmic Time, 2020 August, KITP UC Santa Barbara, CA
Flash Talk: On the Constraints of Galaxy Assembly Bias in Velocity Space
- MOCK Cosmology Conference, 2020 March, Innsbruck, Austria
On the Constraints of Galaxy Assembly Bias in Velocity Space
- Assembly Bias Workshop at Tsung-Dao Lee Institute, 2019 June, Shanghai, China
Constraining Cosmic Growth Rate with Redshift-Space Distortions in the Face of Galaxy Assembly Bias
- MOCK Cosmology Conference, 2019 April, Cordoba, Argentina
The Effects of Galaxy Assembly Bias on the Inference of Growth Rate from Redshift-Space Distortions
- Graduate School of Computer Science, 2019 March, Salt Lake City, UT
Decoding the Nature of the Universe with Observational Cosmology
- Physics and Astronomy Department, 2018 April, Salt Lake City, UT
Ways to Improve our Graduate Environment
- Group Meeting Talk, 2017 October, Salt Lake City, UT
A Gravitational-Wave Standard Siren Measurement of the Hubble Constant
- Graduate Student Seminar, 2017 December, Salt Lake City, UT
Machine Learning with Artificial Neural Networks
- AstroCoffee, 2017 October, Salt Lake City, UT
Attempting to solve Astrophysical Problems with the help of Artificial Neural Networks
- AstroCoffee, 2017 June, Salt Lake City, UT
Part III: The Properties of Star-Forming Galaxies
- Graduate Research Seminar, 2016 October, Salt Lake City, UT
Effects of Galaxy Assembly Bias on Redshift-Space Distortions

Posters

- Graduate Research Symposium, 2019 April, Salt Lake City, UT
Measuring Cosmic Growth Rate in Face of Galaxy Assembly Bias
- Data Mining Course, 1st Place, 2018 May, Salt Lake City, UT
Searching for the galaxy/dark-matter halo connection
- Graduate Research Symposium, Honorable Mention, 2018 March, Salt Lake City, UT
The Effects of Galaxy Assembly Bias on Redshift-Space Distortions
- Summer Research Symposium, 2014 October, Jacksonville, FL
Search for the First Stars of the Universe
- Summer Research Symposium, 2013 October, Jacksonville, FL
Neurosemantic Dynamics: Computational Test of the Effect of Synaptic Clustering

TEACHING EXPERIENCE

- University of Utah**, *Department of Physics and Astronomy*, TA, 9 semesters 2015-Present
- Salt Lake Community College**, *School of Science*, Adjunct Professor, Intro. Astro. Fall 2019
- University of North Florida**, *Department of Physics*, Grader, 6 semesters 2013-2015
- Douglas Anderson School of the Arts**, *Physics Course*, Teaching Apprentice, 1 year 2012-2013

REFEREED PUBLICATIONS

- 3) **McCarthy, K.S.**, Zheng, Z., Guo, H., Luo, W., Lin, Y.T., MNRAS, Submitted 2021
On the constraints of galaxy assembly bias in velocity space
- 2) **McCarthy, K.S.**, Zheng, Z., Ramirez-Ruiz, E., 2020, MNRAS, 499, 5220
Constraining Delay Time Distribution of Binary Neutron Star Mergers from Host Galaxy Properties
- 1) **McCarthy, K.S.**, Zheng, Z., Guo, H., 2019, MNRAS, 487, 2424
The effects of galaxy assembly bias on the inference of growth rate from redshift-space distortions

REFERENCES

Zheng Zheng, Ph.D.
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