KEVIN SPENCER McCARTHY

HOME INSTITUTION
Jet Propulsion Laboratory
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RESEARCH EXPERIENCE

NASA Postdoctoral Program (NPP) Fellow: Euclid/Roman Galaxy Clustering
JPL/IPAC; Advisors: Dr. Yun Wang (science) & Dr. Daniel Stern (official)   2021 – present
Working on Euclid and Roman galaxy clustering, with focus on simulations and modeling in order to mitigate systematics and optimize cosmological analyses. Member of the Euclid Consortium. Collaborator on a proposed Project Infrastructure Team for the Roman Galaxy Redshift Survey.
Research Assistant: Observational Cosmology
University of Utah, Advisor: Dr. Zheng Zheng   2016 – 2021
Laboratory Supervisor: Fiber-Fed Student Spectrograph Construction
University of North Florida, Advisor: Dr. Jane MacGibbon   Spring 2015
Research Assistant: Stellar Evolution
University of North Florida, Advisor: Dr. Jane MacGibbon   Summer 2014
Research Assistant: Computational Neuroscience
University of North Florida, Advisor: Dr. John Anderson   Summer 2013

TEACHING EXPERIENCE

Warrior Scholar Project, *Caltech STEM Bootcamp*, Instructor, Aug. 8-12   2022
University of Utah, *Department of Physics and Astronomy*, TA, 9 semesters   2015-2021
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, *Science*, Teaching Apprentice, 1 year   2012-2013

EDUCATION

University of Utah   2021
Doctor of Philosophy, Physics
Thesis Title: Improving Cosmological Growth-Rate Constraints with Galaxy Clustering
Thesis Advisor: Zheng Zheng
University of North Florida   2015
Bachelor of Science, Physics, *Summa Cum Laude*
Florida State University   2008
Bachelor of Science, Marketing

PUBLIC OUTREACH

- SURF Seminar Day, The Gee Family Poster Competition, Judge, October 2023, Caltech, Pasadena, CA
- NASA's Universe of Learning, Science Briefing on 'The Mysterious Dark Universe', August 2023, Virtual
- 240th AAS Meeting IPAC Booth, Pasadena Convention Center, June 2022, Pasadena, CA
- 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, October 2016, Salt Lake City, UT
- Astronomy Presentation for Girl Scout Troop 660, March 2015, Callahan, FL
- Astronomy Information Table at Durbin Creek Elementary Space Night, February 2015, St. Johns, FL

COMPUTER SKILLS ⌂ @KevinMacAstro

Python. C. 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. Microsoft Office. LaTeX.

CONFERENCE PRESENTATIONS AND POSTERS

Presentations

IPAC Lunch Seminar, Invited Talk, 2023 October, Pasadena, CA
Preparing for Euclid and Roman Galaxy Redshift Surveys: Galaxy Clustering Models and Observational Systematics
Euclid Consortium Annual Meeting, 2023 June, Copenhagen, Denmark
Flash Talk: Line Misidentification with Red Grism Simulations
Euclid Galaxy Clustering SWG and OU-SPE/SIR/LE3 Meeting, 2023 February, Milan, Italy
Grism Simulations and Data Analysis
Euclid Observational Systematics Focus Week, 2022 September, Trieste, Italy
Update on Key Project Paper IV: Line Misidentifications
European Astronomical Society Annual Meeting, Invited Talk, 2022 June, Valencia, Spain
Galaxy Assembly Bias: Beyond HOD?
Astrophysics Luncheon Seminar, 2021 November, JPL—Caltech, Pasadena, CA
Improving Cosmological Growth-Rate Constraints with Galaxy Clustering
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

JPL Postdoc Research Day, 2022 November, Pasadena, CA
Nonlinear Power Spectrum models for Roman High Latitude Spectroscopic Survey between $1.0 < z < 1.2$
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

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

GRANTS AND AWARDS

Senior Astronomy Graduate Student Grant: $11,500 2019
First-Year Astronomy Graduate Research Grant: $6,000 2016
Outstanding Graduate TA Award: $3,000 2015

REFEREED PUBLICATIONS

1) **McCarthy, K.S.**, Zhai, Z., Wang, Y., 2023, MNRAS, Volume 523, Issue 2, 2498
Phenomenological power spectrum models for Hα emission line galaxies from the Nancy Grace Roman Space Telescope
2) **McCarthy, K.S.**, Zheng, Z. Guo, H., Luo, W., Lin, Y.T., 2022, MNRAS, 509, 380
On the constraints of galaxy assembly bias in velocity space
3) **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
4) **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

PAPERS IN PREPARATION

1) **McCarthy, K.S.**, Zhai, Z., Wang, Y.
Cosmological forecasts for Hα Roman High Latitude Spectroscopic Survey: power spectrum + bispectrum
2) Euclid Collaboration: **McCarthy, K.S.**, Walth, G., Wang, Y., Troja, A., Jullo, E., Scodeggio, M.
Euclid preparation. TBD. line-of-sight systematic effects I: red grism simulations