Mason G. MacDougall

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EDUCATION

Ph.D. in Astrophysics & Astronomy, University of California – Los Angeles
Degree Date: June 2023
Thesis Title: *The Orbital Eccentricities of Small Planets*
Thesis Advisor: Erik Petigura

M.S. in Astrophysics & Astronomy, University of California – Los Angeles
Degree Date: June 2020

B.S. in Astrophysics; Minor in Planetary Science, California Institute of Technology
Degree Date: June 2018

SUMMARY

Astrophysicist and Data Scientist with 6+ years of experience in data-driven academic research and 2+ years of experience driving business insights through data analytics. Graduated with a PhD in Astrophysics from UCLA and open to new opportunities that will leverage my expertise in Python software development, statistical modeling, and machine learning to build impactful solutions to complex data problems.

WORK EXPERIENCE

Sept 2023 -	Data Scientist at Google
2022	Data Scientist PhD Intern at Google
2019 - 2022	Data Science Contractor at Kite Pharma, Gilead Sciences
2019	Data Science Consultant at Data Resolutions Club, UCLA

RESEARCH EXPERIENCE

2018 - 2023	Cota-Robles Graduate Research Fellow, Department of Physics & Astronomy, UCLA
2018	Competitive Edge Graduate Research Fellow, UCLA
2018	Research Intern, Jet Propulsion Laboratory, Caltech / NASA
2017	Undergraduate Research Fellow, Dark Cosmology Center, Niels Bohr Institute
2016	Undergraduate Research Fellow, Observatories of The Carnegie Institution for Science
2015	Undergraduate Research Fellow, Infrared Processing and Analysis Center, Caltech
2014	Research Assistant, Department of Computing and Mathematical Sciences, Caltech

COURSEWORK AND PROJECT EXPERIENCE

2022	Project: *Linker Social* App Development with UCLA ACM Hackspace Club
2021	Coursework: Machine Learning with Amazon Web Services (Udacity)
2021	Project: Fellowship Project at Data Science for All (DS4A), Correlation One
2021	Coursework: Introduction to Machine Learning (UCLA – ASTR 278)

EXPERTISE AND INTERESTS

Skills	Data Analytics, Visualization, Programming, Machine Learning, Statistics, Communication
Tools	Python, SQL, Excel, Jupyter, Colab, GitHub, NumPy, Pandas, SciKit-Learn, Kubernetes, C
Interests	AI/ML, Teaching, Research, STEM Outreach, Finance, Running, Traveling, Concerts

TEACHING EXPERIENCE

2019 - 2020	Graduate Teaching Assistant at UCLA: The Nature of the Universe (Astro 3)
2018	Undergraduate Teaching Assistant at Caltech: The Evolving Universe (Ay 1)
2015 - 2023	STEM Tutor, Wyzant Tutoring

HONORS AND AWARDS

2021	Data Science for All (DS4A) Fellowship – Graduation with Honors, Correlation One
2021	Endowed Scholar Award presented by Jane Street & DS4A, Correlation One
2018	Waterman-Glancy Observational Astronomy Workshop Award, Lick Observatory
2018	Competitive Edge Award, UCLA
2018 - Present	Cota-Robles Fellowship, UCLA
2018	Astronomy Division Fellowship, UCLA
2018	Future Physicist International Award, University of Science and Technology of China
2017 - 2018	Mellon Mays Undergraduate Fellowship (MMUF), Caltech
2015, ‘16	Carnation Merit Award, Caltech
2015, ‘16, ‘17	Summer Undergraduate Research Fellowship, Caltech
2014	Freshman Summer Research Institute Award, Caltech

INVITED TALKS

2023	TESS Mission Update Meeting, MIT
2022	TESS-Keck Survey Annual Meeting, UC Santa Cruz
2021	Kite Analytical Insights Seminar, Kite Pharma / Gilead Sciences
2020	Summer Research Lunch Talk, Niels Bohr Institute
2019	Guest Speaker Lunch Talk, Kite Pharma / Gilead Sciences
2018	NASA Cassini Radar Science Meeting, Caltech

CONTRIBUTED TALKS

2018	Competitive Edge Research Seminar, UCLA
2017	MMUF Western Regional Conference, University of New Mexico
2017	Dark Cosmology Center Student Symposium, Niels Bohr Institute
2017, ‘18	American Astronomical Society Meeting
2016	Summer Student Symposium, Carnegie Observatories
2015, ‘16, ‘17	Summer Undergraduate Research Seminar Day, Caltech

SERVICE

2021	UCLA Graduate-Undergraduate Mentor
2020	Carnegie Observatories CASSI Intern Mentor
2019 - 2022	UCLA Minorities in Physics and Astronomy Mentor
2019 - 2021	UCLA Planetarium Co-Coordinator
2016 - 2018	Caltech Latino Association Mentor

SELECTED PUBLICATIONS

1. **MacDougall, M. G.**, Petigura, E. A., at colleagues 2023, "The TESS-Keck Survey. XVIII. Distribution of Orbital Eccentricities for 106 planets around 83 TESS Host Stars", in prep.
2. **MacDougall, M. G.** 2023, "The Orbital Eccentricities of Small Planets", *UCLA*, ProQuest ID: MacDougall_ucla_0031D_21788.
3. **MacDougall, M. G.**, Petigura, E. A., and Gilbert, G.J. 2023, "Accurate and Efficient Photoeccentric Transit Modeling", *The Astronomical Journal*, 166, 61, doi: 10.3847/1538-3881/ace16d.
4. **MacDougall, M. G.**, Petigura, E. A., and 39 colleagues 2023, "The TESS-Keck Survey. XV. Precise Properties of 108 TESS Planets and Their Host Stars", *The Astronomical Journal*, 166, 33, doi: 10.3847/1538-3881/acd557.
5. **MacDougall, M. G.**, Petigura, E. A., and 59 colleagues 2022, "The TESS-Keck Survey. XIII. An Eccentric Hot Neptune with a Similar-Mass Outer Companion around TOI-1272", *The Astronomical Journal*, 164, 97, doi: 10.3847/1538-3881/ac7ce1.
6. Gilbert, G. J., **MacDougall, M. G.**, and Petigura, E. A. 2022, "Implicit Biases in Transit Models using Stellar Pseudo-density", *The Astronomical Journal*, 164, 92, doi: 10.3847/1538-3881/ac7f2f.
7. Chontos, A., Murphy, J. M. A., **MacDougall, M. G.**, and 28 colleagues 2022, "The TESS-Keck Survey: Science Goals and Target Selection", *The Astronomical Journal*, Accepted, 163, 297, doi: 10.3847/1538-3881/ac6266.
8. **MacDougall, M. G.**, Petigura, E. A., and 46 colleagues 2021, "The TESS-Keck Survey. VI. Two Eccentric sub-Neptunes Orbiting HIP-97166", *The Astronomical Journal*, 162, 265, doi: 10.3847/1538-3881/ac295e.
9. Dalba, P. A., Kane, S. R., Li, Z., **MacDougall, M. G.**, and 12 colleagues 2021, "Giant Outer Transiting Exoplanet Mass (GOT 'EM) Survey. II. Discovery of a Failed Hot Jupiter on a 2.7 Year, Highly Eccentric Orbit", *The Astronomical Journal*, 162, 154, doi: 10.3847/1538-3881/ac134b.

OTHER PUBLICATIONS

1. Grunblatt, S., Saunders, N., and 14 colleagues 2023, "TESS Giants Transiting Giants IV. An unlikely survivor: an inflated hot Neptune", *Science*, In Review.
2. Mallorquín, M., Goffo, E., and 76 colleagues 2023, "TOI-1801 b: a temperate mini-Neptune around a young M0.5 dwarf", *Astronomy & Astrophysics*, Submitted.
3. Weiss, L. M., Isaacson, H., and 19 colleagues 2023, "The Kepler Giant Planet Search. I: A Decade of Kepler Planet Host Radial Velocities from W. M. Keck Observatory", *The Astronomical Journal*, Submitted.
4. Beard, C., Robertson, P., and 42 colleagues 2023, "The TESS-Keck Survey XVII: Precise Mass Measurements in a Young, High Multiplicity Transiting Planet System using Radial Velocities and Transit Timing Variations", *The Astronomical Journal*, Submitted.
5. Akana Murphy, J. M., Batalha, N. M., and 44 colleagues 2023, "The TESS-Keck Survey. Mass Measurements of 12 Planets in Eight Systems", *The Astronomical Journal*, Accepted.
6. Hon, M., Huber, D., and 37 colleagues 2023, "A close-in Jovian planet orbiting a helium-burning red giant star", *Nature*, 618, 917, doi: 10.1038/s41586-023-06029-0.
7. Zink, J., Hardegree-Ullman, K., and 21 colleagues 2023, "Scaling K2. VI. Reduced Small Planet Occurrence in High Galactic Amplitude Stars", *The Astronomical Journal*, 165, 262, doi: 10.3847/1538-3881/acd24c.

8. Yee, S. W., Winn, J. N., and 82 colleagues 2023, “The TESS Grand Unified Hot Jupiter Survey. II. Twenty Giant Planets”, *The Astrophysical Journal Supplement Series*, 265, 1, doi: 10.3847/1538-4365/aca286.
9. Brinkman, C. L., Weiss, L. M., and 25 colleagues 2023, “TOI-561 b: A Low Density Ultra-Short Period ‘Rocky’ Planet around a Metal-Poor Star”, *The Astronomical Journal*, 165, 88, doi: 10.3847/1538-3881/acad83.
10. Van Zandt, J. E., Petigura, E. A., **MacDougall, M. G.**, and 33 colleagues 2023, “The TESS-Keck Survey. XIV. Two giant exoplanets from the Distant Giants Survey”, *The Astronomical Journal*, 165, 60, doi: 10.3847/1538-3881/aca6ef.
11. Dai, F., Masuda, K., and 61 colleagues 2023, “TOI-1136 is a Young, Coplanar, Aligned Planetary System in a Pristine Resonant Chain”, *The Astronomical Journal*, 165, 33, doi: 10.3847/1538-3881/aca327.
12. Angelo, I., Naoz, S., Petigura, E. A., **MacDougall, M. G.**, and 3 colleagues 2022, “Kepler-1656b’s Extreme Eccentricity: signature of a Gentle Giant”, *The Astronomical Journal*, 163, 227, doi: 10.3847/1538-3881/ac6094.
13. Petigura, E. A., Rogers, J. G., Isaacson, H., and 13 colleagues 2022, “The California-Kepler Survey. X. The Radius Gap as a Function of Stellar Mass, Metallicity, and Age”, *The Astronomical Journal*, 163, 179, doi: 10.3847/1538-3881/ac51e3.
14. Turtelboom, E. V., Weiss, L. M., Dressing, C. D., and 75 colleagues 2022, “The TESS-Keck Survey. XI. Mass Measurements for Four Transiting sub-Neptunes orbiting K dwarf TOI 1246”, *The Astronomical Journal*, 163, 293, doi: 10.3847/1538-3881/ac69e5.
15. Weiss, L. M., Dai, F., Huber, D., and 61 colleagues 2021, “The TESS-Keck Survey. II. An Ultra-short-period Rocky Planet and Its Siblings Transiting the Galactic Thick-disk Star TOI-561”, *The Astronomical Journal*, 161, 56, doi: 10.3847/1538-3881/abd409.
16. Margot, J., Pavlo, P., and 38 colleagues 2021, “A Search for Technosignatures around 31 Sun-like Stars with the Green Bank Telescope at 1.15-1.73 GHz”, *The Astronomical Journal*, 161, 55, doi: 10.3847/1538-3881/abcc77.