CORAL WHEELER

Center for Astrophysics & Space Sciences (CASS)
Science & Engineering Research Facility (SERF), University of California, San Diego
9500 Gilman Dr, La Jolla, CA 92093
coralrosewheeler@gmail.com ** (949) 300-5574 ** Citizenship: United States

RESEARCH INTERESTS

Theoretical astrophysics * structure formation * galaxy formation and evolution * small-scale challenges to ΛCDM * the Local Group and dwarf galaxies * ultra-faint and satellite galaxies * near-field cosmology * galactic archaeology * reionization and galaxy quenching * galactic structure and morphology * cosmological and idealized hydrodynamic simulations * comparison between N-body simulations and large surveys

EDUCATION

University of California, Irvine, Irvine, CA
Ph.D., Physics and Astronomy, September, 2016
Advisor: James Bullock

The University of Akron, Akron, OH
B.S., Mathematics (double major Mathematics & Physics), December, 2003
Summa Cum Laude

RESEARCH POSITIONS

NASA Hubble Fellow	Carnegie	Starting Dec 2019
UC President's Postdoctoral Fellow	UCSD	Sep-Nov 2019
Burke Institute DuBridge Postdoctoral Fellow	Caltech	2016-2019
Josephine de Karman Dissertation Year Fellow	UC Irvine	2015-2016
Graduate Student Researcher	UC Irvine	2012-2015
GAANN Fellow	UC Irvine	2006-2008

AWARDS and HONORS

2019: NASA Hubble Fellowship

2019: University of California President's Postdoctoral Fellowship

2019: NAS Kavli Frontiers of Science Fellow 2019

2016: DuBridge Postdoctoral Fellowship from the Burke Institute

2015: Graduate Women in Science (GWIS) Eloise Gerry Fellowship

2015: Josephine de Karman Dissertation Year Fellowship

2012: Chancellor's Fellowship for re-entry into the astronomy/astrophysics PhD program at UC Irvine.

2006,2007: GAANN fellowship at UC Irvine.

2005: Regents Fellowship at UC Irvine.

2003: Householder Physics Prize for outstanding achievement of an undergraduate physics student.

2002: Alberta M. and William C. King scholarship for mathematics

2000, 2001: Mary E. Maxwell scholarship for outstanding freshman or sophomore in mathematics.

INVITED and CONTRIBUTED TALKS

Invited:

2019: "Fall 2019 National Hubble Fellowship Program Symposium" in Washington D.C. * "FUTURE of Physics 2019" at Caltech * "Diversity of the Local Universe" at the Special Astrophysical Observatory of the Russian Academy of Sciences in Nizhnij Arkhyz, Russia * Fourth annual Kavli Frontiers of Science symposium in Incheon, South Korea, representing the United states in the session "A New Frontier in Cosmological Simulations" * CASS Astrophysics Seminar at UCSD * Department of Astronomy Colloquium at the University of Illinois, Urbana-Champain * Department of Astronomy Colloquium at the UC Santa Barbara * Department of Physics Colloquium at Queens University * Department of Astronomy Colloquium at the University of Maryland * Institute for Astronomy Colloquium at the University of Hawaii * Department of Physics and Astronomy Colloquium at the University of Hawaii

2018: Department of Physics & Astronomy Colloquium at California State University, Los Angeles * Colloquium at the Jet Propulsion Laboratory * Department of Astronomy Colloquium at the University of Michigan * American Physical Society April Meeting in Columbus, Ohio and associated press conference

2017: Fifth Annual GMT Community Science Meeting: "The Chemical Evolution of the Universe: From Cosmic Dawn to Cosmic Noon" in Tarrytown, New York * Lorentz Center workshop: "Large Surveys of the Great Andromeda Galaxy" in Leiden, NL * Frank N. Bash Symposium in Austin, TX
Astronomy on Tap in Austin, TX * Astronomy on Tap in Pasadena, CA

2016: Seminar at the Institute for Advanced Studies

2015: Seminar at The Ohio State University * Seminar at Carnegie Observatories * Seminar at the Harvard-Smithsonian Center for Astrophysics * Seminar at Columbia University * Seminar at UC Riverside * TAPIR seminar at Caltech * Seminar at Stanford * Seminar at UC Berkeley * Seminar at UC Santa Cruz * Seminar at UC San Diego

Contributed:

2018: "The Physics of Galaxy Scaling Relations and the Nature of Dark Matter" in Kingston, ON * UCSC Galaxy Formation Workshop in Santa Cruz, CA

2017: Swinburne-Caltech Workshop in Pasadena, CA * UCSC Galaxy Formation Workshop in Santa Cruz, CA

2016: STScI Symposium: "What Shapes Galaxies" in Baltimore, MD * 13th Potsdam Thinkshop: "Near Feild Cosmology" in Potsdam, Germany

2015: "Satellites and Streams in Santiago" in Santiago, Chile * "Multiwavelength Dissection of Galaxies" in Sydney, Australia * "Local Group Astrostatistics" in Ann Arbor, MI * "Mocking the Universe" in Baltimore, MD * UCSC Galaxy Formation Workshop in Santa Cruz, CA * 3rd annual GMT Community Science Meeting: "ReSOLVING Galaxies in the Era of Extremely Large Telescopes" in Pacific Grove, CA

2014: 11th Potsdam Thinkshop: "Satellite galaxies and dwarfs in the local group" in Potsdam, Germany * Seminar at MPIA and HITS in Heidelberg, Germany * Seminar at Yale University in New Haven, CT * UCSC Galaxy Formation Workshop in Santa Cruz, CA

2013: 221st meeting of the American Astronomical Society in Long Beach, CA * UCSC Galaxy Formation Workshop in Santa Cruz, CA

2012: UCLA Dwarf Galaxy Workshop in Los Angeles, CA

TEACHING EXPERIENCE

Caltech Ay 127 — Spring 2017
Guest lecturer for graduate level cosmology and galaxy formation course.

UC Irvine Astronomy 20A and Physics 240A — Fall 2012
Taught discussion sections, graded homework and exams, and gave lectures for introductory astronomy course as well as for a graduate level math physics course.

UC Irvine Cosmology 20B and Physics 7 — Fall 2005 and Spring 2006
Taught discussion section, monitored lab, and graded homework and the final project for an introductory physics course and an introductory cosmology course.

Substitute teacher and math tutor 2001 - 2005

Worked as a private math tutor for students in subjects ranging from pre-algebra to statistics and differential equations. Employed as a substitute teacher for Akron public schools, specializing in physics and mathematics.

BROADER IMPACT

PMA division representative for the Caltech Postdoc Association (CPA)

Volunteer for Women in PMA at Caltech (WiPMA)

Created the UCI Women in Physics "Grad-Undergrad Mentor Match-up" program, a program that pairs postdoctoral and graduate women with undergraduate women in physics to improve retention of women in the field.

Physical Sciences Representative in the Associated Graduate Students (AGS) at UCI. Focused on improving campus climate and family-friendly benefits for graduate students, and improving graduate student mental health.

Head Steward and Southern Vice President of UAW 2865, the union for TAs, Readers and Tutors at UCI. Negotiated or supported negotiations for better family friendly policies for student and postdoctoral workers at the UC. Participated in a joint committee with the University of California to create a program designed to provide undocumented students the opportunity to attend graduate school.

REFERENCES

Phil Hopkins, Ph.D.
Professor
Caltech
phopkins@caltech.edu

Andrew Wetzel, PhD.
Assistant Professor
University of California, Davis
awetzel@ucdavis.edu

James S. Bullock, PhD.
Professor
University of California, Irvine
bullock@uci.edu

Evan Kirby, PhD.
Assistant Professor
Caltech
enk@astro.caltech.edu

Michael Boylan-Kolchin, PhD.
Associate Professor
University of Texas at Austin
mbk@astro.as.utexas.edu

Dušan Kereš, PhD.
Associate Professor
University of California, San Diego
dkeres@physics.ucsd.edu

Michael C. Cooper, PhD.
Associate Professor
University of California, Irvine
cooper@uci.edu

Robyn Sanderson, PhD.
Assistant Professor
University of Pennsylvania
robynes@sas.upenn.edu

FIRST AUTHOR PUBLICATIONS

Wheeler, Coral; Hopkins, Philip F.; Pace, Andrew B.; Garrison-Kimmel, Shea; Boylan-Kolchin, Michael; Wetzel, Andrew; Bullock, James S.; Kereš, Dušan; Faucher-Giguère, Claude-André; Quataert, Eliot, "Be it therefore resolved: Cosmological Simulations of Dwarf Galaxies with 30 Solar Mass Resolution," 2019, accepted in *MNRAS*

Wheeler, Coral; Hopkins, Philip F.; Doré, Olivier, "The radial acceleration relation is a natural consequence of the baryonic Tully-Fisher relation," 2019, *ApJ*, Volume 882, Issue 1, p.46

Wheeler, Coral; Pace, Andrew B.; Bullock, James S.; Boylan-Kolchin, Michael; Oñorbe, Jose; Fitts, Elbert, Oliver D., Alex; Hopkins, Phil; Kereš, Dušan; "The no-spin zone: rotation vs dispersion support in observed and simulated dwarf galaxies," 2017, *MNRAS*, Volume 465, Issue 2, p.2420-2431

Wheeler, Coral; Onorbe, Jose; Bullock, James S.; Boylan-Kolchin, Michael; Elbert, Oliver D.; Garrison-Kimmel, Shea; Hopkins, Phil; Kereš, Dušan; "Sweating the small stuff: simulating dwarf galaxies, ultra-faint dwarf galaxies, and their own tiny satellites," 2015, *MNRAS*, Volume 453, Issue 2, p.1305-1316

Wheeler, Coral; Phillips, John I.; Cooper, Michael C.; Boylan-Kolchin, Michael; Bullock, James S., "The surprising inefficiency of dwarf satellite quenching," 2014, *MNRAS*, Volume 442, Issue 2, p.1396-1404

C R Wheeler, R D Ramsier and P N Henriksen, "Visibility of thin-film interference fringes," Amer. J. Phys. 72, 279, 2004

C R Wheeler, R D Ramsier and P N Henriksen, "Observing thin-film interference effects," Phys. Educ. 38, No 6, 495-496, Nov 2003

C R Wheeler, R D Ramsier and P N Henriksen, "An investigation of the temporal coherence length of light," Eur. J. Phys. 24 No 4, 443-450, July 2003

OTHER PUBLICATIONS

Fillingham, Sean P.; Cooper, Michael C.; Kelley, Tyler; Rodriguez Wimberly, M. K.; Boylan-Kolchin, Michael; Bullock, James S.; Garrison-Kimmel, Shea; Pawlowski, Marcel S.; Wheeler, Coral, "Characterizing the Infall Times and Quenching Timescales of Milky Way Satellites with Gaia Proper Motions," 2019, preprint(arXiv:1906.04180)

Garrison-Kimmel, Shea; Wetzel, Andrew; Hopkins, Phillip F.; Sanderson, Robyn; El-Badry, Kareem; Graus, Andrew; Chan, T. K.; Feldmann, Robert; Boylan-Kolchin, Michael; Hayward, Christopher; Bullock, James S.; Fitts, Alex; Samuel, Jenna; Wheeler, Coral; Keres, Dusan; Faucher-Giguere, Claude-Andre, "Star formation histories of dwarf galaxies in the FIRE simulations: dependence on mass and Local Group environment," 2019, *MNRAS*, Volume 489, Issue 4, p.4574-4588

Su, Kung-Yi; Hopkins, Philip F.; Hayward, Christopher C.; Ma, Xiangcheng; Boylan-Kolchin, Michael; Kasen, Daniel; Kereš, Dušan; Faucher-Giguère, Claude-André; Orr, Matthew E.; Wheeler, Coral, "Discrete effects in stellar feedback: Individual Supernovae, Hypernovae, and IMF Sampling in Dwarf Galaxies," 2018, *MNRAS*, Volume 480, Issue 2, p.1666-1675

Hopkins, Philip F.; Wetzel, Andrew; Kereš, Dušan; Faucher-Giguère, Claude-André; Quataert, Eliot; Boylan-Kolchin, Michael; Murray, Norman; Hayward, Christopher C.; Garrison-Kimmel, Shea; Hummels, Cameron; Feldmann, Robert; Torrey, Paul; Ma, Xiangcheng; Angles-Alcazar, Daniel; Su, Kung-Yi; Orr, Matthew; Schmitz, Denise; Escala, Ivanna; Sanderson, Robyn; Grudic, Michael Y.; Hafen, Zachary; Kim, Ji-Hoon; Fitts, Alex; Bullock, James S.; Wheeler, Coral; Chan, T. K.; Elbert, Oliver D.; Narayanan, Desika, "FIRE-2 simulations: physics versus numerics in galaxy formation," 2018, *MNRAS*, Volume 480, Issue 1, p.800-863

Fitts, Alex; Boylan-Kolchin, Michael; Bullock, James S.; Weisz, Daniel R.; El-Badry, Kareem; Wheeler, Coral; Faucher-Giguère, Claude-André; Quataert, Eliot; Hopkins, Philip F.; Kereš, Dušan; Wetzel, Andrew; Hayward, Christopher C., "No assembly required: mergers are mostly irrelevant for the growth of low-mass dwarf galaxies," 2018, *MNRAS*, Volume 479, Issue 1, p.319-331

Fillingham, Sean P.; Cooper, Michael C.; Boylan-Kolchin, Michael; Bullock, James S.; Garrison-Kimmel, Shea; Wheeler, Coral, "Environmental quenching of low-mass field galaxies," 2018, *MNRAS*, Volume 477, Issue 4, p.4491-4498

Escala, Ivanna; Wetzel, Andrew; Kirby, Evan N.; Hopkins, Philip F.; Ma, Xiangcheng; Wheeler, Coral; Kereš, Dušan; Faucher-Giguère, Claude-André; Quataert, Eliot, "Modelling chemical abundance distributions for dwarf galaxies in the Local Group: the impact of turbulent metal diffusion," 2018, *MNRAS*, Volume 474, Issue 2, p.2194-2211

Fitts, Alex; Boylan-Kolchin, Michael; Elbert, Oliver D.; Bullock, James S.; Hopkins, Philip F.; Oñorbe, Jose; Wetzel, Andrew; Wheeler, Coral; Faucher-Giguère, Claude-André; Kereš, Dušan; Skillman, Evan D.; Weisz, Daniel R. "FIRE in the

field: simulating the threshold of galaxy formation," 2017, *MNRAS*, Volume 471, Issue 3, p.3547-3562

Fillingham, Sean P.; Cooper, Michael C.; Pace, Andrew B.; Boylan-Kolchin, Michael; Bullock, James S.; Garrison-Kimmel, Shea; Wheeler, Coral; "Under pressure: quenching star formation in low-mass satellite galaxies via stripping," 2016, *MNRAS*, Volume 463, p.1916-1928

Fillingham, Sean; Cooper, Michael C.; Wheeler, Coral; Garrison-Kimmel, Shea; Boylan-Kolchin, Michael; Bullock, James S., "Taking care of business in a flash: Constraining the timescale for low-mass satellite quenching with ELVIS," 2015, *MNRAS* Volume 454, Issue 2, p.2039-2049

Phillips, John I.; Wheeler, Coral; Cooper, Michael C.; Boylan-Kolchin, Michael; Bullock, James S.; Tollerud, Erik J., "The mass dependence of satellite quenching in Milky Way-like halos," 2015, *MNRAS*, Volume 447, Issue 1, p.698-710

Phillips, John I.; Wheeler, Coral; Boylan-Kolchin, Michael; Bullock, James S.; Cooper, Michael C.; Tollerud, Erik J., "A dichotomy in satellite quenching around L* galaxies," *MNRAS*, 2014, Volume 437, Issue 2, p.1930-1941

Kaufmann, Tobias; Wheeler, Coral; Bullock, James S., "On the morphologies, gas fractions, and star formation rates of small galaxies," 2017, *MNRAS*, Volume 382, Issue 3, pp. 1187-1195

Brian Cheyne, Vishal Gupta, Coral Wheeler, "Hamilton cycles in addition graphs," Rose Hullman Undergraduate Mathematics Journal, Volume 4(1), 2003