

ANDREW WETZEL

ASSOCIATE PROFESSOR

DEPARTMENT OF PHYSICS & ASTRONOMY

UNIVERSITY OF CALIFORNIA, DAVIS

ONE SHIELDS AVENUE

DAVIS CA 95616

AWETZEL@UCDAVIS.EDU

RESEARCH INTERESTS

theoretical astrophysics and cosmology
computational methods of cosmological simulations
cosmological structure formation: halos, galaxies, stars
formation history of the Milky Way and galaxies in the Local Group
near-field cosmology: dark matter and its distribution in the local Universe

APPOINTMENTS

Associate Professor	2021 -
Assistant Professor	2016 - 2021
Department of Physics & Astronomy, University of California, Davis	
Caltech - Carnegie Fellow	2013 - 2017
Moore Prize Scholar – TAPIR, California Institute of Technology	
Carnegie Fellow – The Observatories of the Carnegie Institution for Science	
Postdoctoral Research Associate – Department of Astronomy, Yale University	2010 - 2013
Graduate Researcher (NSF Fellow) – Department of Astronomy, UC Berkeley	2005 - 2010
Research Associate – Theoretical Astrophysics Group, Los Alamos National Laboratory	2005

EDUCATION

Ph.D. in Astrophysics – University of California, Berkeley	2010
M.A. in Astrophysics – University of California, Berkeley	2007
B.S. in Physics with Honors & High Distinction – Harvey Mudd College	2005

HONORS & AWARDS

Presidential Early Career Award for Scientists & Engineers (PECASE) – Biden White House	2025
Graduate Program Advising and Mentoring Award – UC Davis	2022
NSF CAREER award – National Science Foundation	2021
Hellman Fellow – Society of Hellman Fellows	2019
Scialog Fellow – Research Corporation, Heising-Simons Foundation	2018, 2019
Kavli Frontiers of Science Fellow – National Academy of Sciences	2013
NSF Graduate Research Fellow – National Science Foundation	2007 - 2010
N.D. Delegate – National Youth Science Camp	2001

RESEARCH ADVISING

POSTDOCS (2)

Samantha Benincasa	2018 - 2020
Sarah Loebman (NASA Hubble Fellow, UC Davis Chancellor's Fellow)	2017 - 2020

GRADUATE STUDENTS (8)

Heather Pearson	2023 -
Megan Barry	2020 -
Fiona McCluskey (NASA FINESST awardee)	2019 -
Preet Patel	2020 - 2023
Pratik Gandhi (TACC Frontera Fellow)	2019 - 2024
Matt Bellardini	2018 - 2023
Isaiah Santistevan (NASA FINESST awardee)	2018 - 2023
Jenna Samuel	2018 - 2021

UNDERGRADUATE STUDENTS (10)

Rori Kang (Harvey Mudd College) – REU	2024
Jason Chen	2024
Alfredo Calderon (Cal Poly Humboldt) – Cal-Bridge summer	2023
Russell Graf – Senior Thesis	2022 - 2023
Rachel Perelgut – Senior Thesis	2022 - 2023
Heather Pearson (Oberlin College) – REU	2022
Bhavya Pardasani (U of Illinois) – REU	2021
Sierra Chapman – Senior Honors Thesis	2018 - 2019
Preet Patel (U of Michigan) – BlueWaters Student Internship	2018 - 2020
Kareem El-Badry (Yale University) – Caltech SURF	2015

CONFERENCE ORGANIZING

<i>Milky Way research: connecting the near and far field</i> – Paris, France	Oct 2023
<i>Bay Area Local Group Workshop</i> – Berkeley CA	Oct 2018
<i>Dynamics of the Milky Way System in the Era of Gaia</i> – Aspen CO	Aug 2018
<i>IUPAP Conference on Computational Physics</i> – Davis CA	July 2018
<i>The Life and Death of Satellite Galaxies</i> – Leiden, Netherlands	Apr 2015
<i>Pasadena Postdoc Retreat</i> – Lake Arrowhead CA	Apr 2015
<i>Mayacamas Meeting</i> – Calistoga CA	Apr 2014

PROFESSIONAL SERVICE

MENTOR FOR CAL-BRIDGE PROGRAM

	2020 -
Richard Truong (San Francisco State U)	2023 - 2025
Pedro Jesus Quinonez (Sonoma State U)	2021 - 2023

TELESCOPE TIME ALLOCATION COMMITTEE

Hubble Space Telescope (external)	
University of California Observatories (2 semesters)	2019
Caltech Optical Observatories (2 semesters)	2015
Yale University (3 semesters)	2012 - 2013

GRANT REVIEW

Research Corporation for Science Advancement – Cottrell Scholar Award
 European Research Council – Consolidator Grants (external)
 NSF – Faculty Early Career Development Program (CAREER)
 NSF – Astronomy & Astrophysics Postdoctoral Fellowships (external)
 NSF – Astronomy & Astrophysics Research Grants
 NASA – Astrophysics Theory Program

JOURNAL REVIEW

Science, Nature Astronomy, Physical Review Letters, Physical Review D,
The Astrophysical Journal Letters, The Astrophysical Journal,
Monthly Notices of the Royal Astronomical Society

MUSIC

Carillonneur Member: Guild of Carillonneurs in North America 2010 -

DEPARTMENTAL COLLOQUIA & SEMINARS (LAST 4 YEARS)

UC Santa Cruz – Cosmology/Galaxies/IGM Seminar	Feb 2025
University of Pennsylvania – Astrophysics Seminar	Apr 2024
MIT, Kavli Institute – Astrophysics Colloquium	Apr 2024
California State University, Sacramento – Physics & Astronomy Colloquium	Aug 2022
Missouri University of Science & Technology – Physics Colloquium	Mar 2022
University of Waterloo – Astrophysics Seminar	Feb 2022

CONFERENCE PRESENTATIONS (LAST 4 YEARS)

<i>Small-Scale Structure of the Universe & Self-Interacting Dark Matter</i> – Valencia, Spain	June 2025
<i>UncharTED: TEDx UC Davis</i> – Davis CA	Apr 2025
<i>IAU Symposium 395: Stellar populations in the Milky Way & beyond</i> – Paraty, Brazil	Nov 2024
<i>GalFRESCA</i> – Pasadena CA	Sep 2024
<i>The Milky Way Assembly Tale</i> – Bologna, Italy	May 2024
<i>American Physical Society - April Meeting</i> – Sacramento CA	Apr 2024
<i>Milky Way research: connecting the near and far field</i> – Paris, France	Oct 2023
<i>Wide-Field Spectroscopy versus Galaxy Formation Theory</i> – Tucson AZ	Mar 2023
<i>Early Disk-Galaxy Formation</i> – Kuala Lumpur, Malaysia	Feb 2023
<i>Linking the Galactic & Extragalactic</i> – Wollongong, Australia	Nov 2022
<i>Disk Formation Workshop</i> – Irvine CA	Sep 2022
<i>Santa Cruz Galaxy Workshop</i> – Santa Cruz CA	Aug 2022
<i>From Stars to Galaxies II</i> – Gothenberg, Sweden	June 2022
<i>Galactic Archeology with Fundamental Stellar Parameters</i> – Aspen CO	June 2021

GRANT FUNDING AWARDED (\$7.0 MILLION TOTAL, \$3.0 MILLION TO WETZEL)

PI (FI Fiona McCluskey)	2024
NASA – Future Investigators in NASA Earth, Space Science, Technology (FINESST) – \$100,000 <i>Deciphering Galactic Disk Formation: Galactic Archaeology in a Cosmological Context</i>	
PI: NSF – Faculty Early Career Development Program (CAREER) – \$800,117	2021
<i>Galactic Archeology: Understanding the Building Blocks of the Milky Way across Cosmic Time</i>	
PI (with Laura Sales)	2021
NSF – Astronomy & Astrophysics Research Grant – \$574,714 (\$273,175 to Wetzel) <i>Collaborative Research: Magellanic Dwarfs as a Key Laboratory for Dwarf Galaxy Formation</i>	
PI (FI Isaiah Santistevan)	2021
NASA – Future Investigators in NASA Earth, Space Science, Technology (FINESST) – \$90,000 <i>Modeling the Cosmological Evolution of Satellite Dwarf Galaxies in 6D Phase Space</i>	
co-I (PI Tony Sohn): NASA STScI – HST GO (Cycle 28) – \$367,209 (\$28,382 to Wetzel)	2020
<i>Andromeda & the Seven Dwarfs: M31 Mass, Satellite Orbits, & the Nature of the Satellite Plane</i>	
co-PI (PI Robyn Sanderson)	2019
NASA – Astrophysics Theory Program – \$498,022 (\$171,347 to Wetzel) <i>Predicting Observable Signatures for Dynamical Interactions between Dark-Matter...</i>	
PI: NASA STScI – HST Legacy Theory Program (Cycle 27) – \$415,402 (\$215,460 to Wetzel)	2019
<i>Probing the Epoch of Reionization with the Fossil Record of Nearby Dwarf Galaxies</i>	
co-PI (PI Dan Weisz)	2019
NASA STScI – HST Treasury Program (Cycle 27) – \$1.7 million (\$204,403 to Wetzel) <i>Tracing the 6-D Orbital & Formation History of the Complete M31 Satellite System</i>	
PI (with Keith Hawkins and Jennifer van Saders)	2019
Heising-Simons Foundation – \$165,000 (\$55,000 to Wetzel) <i>Aging Gracefully: Stellar Ages Across the HR Diagram & Implications for Galactic Archeology</i>	
PI: UC Davis Hellman Fellowship – \$18,000	2019
<i>Using Stars as Gravitational Antennae to Measure Dark Matter</i>	
PI: NASA – Astrophysics Theory Program – \$394,195	2017
<i>Modeling Galactic Archeology of the Milky Way</i>	
Admin PI: NASA STScI – Hubble Fellowship for Sarah Loebman – \$342,764	2017
<i>Mapping the Dark Matter in the Milky Way using Next-Generation Cosmological Simulations</i>	
PI: NASA STScI – HST Theory Program (Cycle 25) – \$115,600	2017
<i>Understanding the Physics of Gas Stripping and Star-Formation Quenching...</i>	
co-PI (PI Nitya Kallivayalil)	2016
NASA STScI – HST Treasury Program (Cycle 24) – \$725,754 (\$218,014 to Wetzel) <i>Milky Way Cosmology: Laying the Foundation for Full 6-D Dynamical Mapping...</i>	
co-I (PI James Bullock): NASA STScI – HST Theory Program (Cycle 24) – \$120,000	2016
<i>Accurate Predictions for Dark Matter Substructure</i>	
co-I (PI Daisuke Nagai): NSF – Astronomical Sciences – \$494,000	2014
<i>Modeling the Cosmic Melting Pots in the Outskirts of Galaxies and Galaxy Clusters</i>	
co-I (PI Andrew Benson): NASA STScI – HST Theory Program (Cycle 22) – \$120,000	2014
<i>Going out with a bang or a whimper? Star Formation and Quenching in the Local Group...</i>	

SUPERCOMPUTING AWARDED (933 MILLION CORE-HOURS, \$12.7 MILLION IN VALUE)

co-I (PI Phil Hopkins): NSF Frontera – 134.4 million core-hours <i>Simulating New Physics on Cosmological Scales: The Feedback In Realistic Environments Project</i>	2024
co-PI (PI Coral Wheeler): ACCESS Stampede-3 – 1.3 million core-hours <i>Simulating the Milky Way's Smallest Companions</i>	2024
co-PI (PI Sarah Loebman): XSEDE Stampede-2 – 3.4 million core-hours <i>Simulating Star Clusters & GMCs Across the Milky Way</i>	2022
PI (FI Isaiah Santistevan): NASA Pleiades – 4.9 million core-hours <i>Modeling the Cosmological Evolution of Satellite Dwarf Galaxies in 6D Phase Space</i>	2021
co-I (PI Phil Hopkins): NSF Frontera – 165.2 million core-hours <i>Simulating New Physics on Cosmological Scales: The Feedback In Realistic Environments Project</i>	2021
PI : NASA Pleiades – 16.5 million core-hours <i>Tracing the 6-D Orbital & Formation History of the Complete M31 Satellite System</i>	2021
PI : NASA Pleiades – 21.0 million core-hours <i>Probing the Epoch of Reionization with the Fossil Record of Nearby Dwarf Galaxies</i>	2021
co-I (PI Phil Hopkins): NSF Frontera – 100.8 million core-hours <i>Testing Fundamentally New Physics in Galaxies</i>	2021
PI : XSEDE Stampede-2 and Bridges-2 – 10.6 million core-hours <i>The Milky Way: A Billion Particles on FIRE</i>	2020
PI : XSEDE Stampede-2 – 1.7 million core-hours – <i>Simulating the Milky Way with the LMC</i>	2019
PI : NASA Pleiades – 31.2 million core-hours – <i>Modeling Galactic Archeology of the Milky Way</i>	2019
co-I (PI Phil Hopkins): NSF Frontera – 127.7 million core-hours <i>Probing New Physics in Galaxy Formation at Ultra-High Resolution</i>	2019
PI : NASA Pleiades – 14.3 million core-hours <i>Understanding the Physics of Gas Stripping & Star-Formation Quenching...</i>	2018
PI : XSEDE Stampede-2 – 5.6 million core-hours – <i>Simulating the Local Group</i>	2017
co-I (PI Joseph Smidt): LANL Grizzly – 30 million core-hours <i>Simulating the Dark Matter Distribution in the Local Group</i>	2017
co-I (PI Phil Hopkins): NCSA Blue Waters – 160 million core-hours <i>Probing New Physics in Galaxy Formation at Ultra-High Resolution</i>	2017
PI : NASA Pleiades – 16.4 million core-hours <i>Simulating the Proper Motions of Dwarf Galaxies around the Milky Way</i>	2016
co-I (PI Phil Hopkins): NASA Pleiades – 31.2 million core-hours <i>FIRE: Dark Matter & Galaxy Formation with Unprecedented Physics and Resolution</i>	2016
co-I (PI Shea Garrison-Kimmel): NASA Pleiades – 22 million core-hours <i>The Local Group: Galaxy Formation in the Nearby Universe</i>	2016
PI : XSEDE Stampede – 3.6 million core-hours – <i>Simulating the Local Group</i>	2016
PI : NASA Pleiades – 1.2 million core-hours – <i>Dwarf Galaxies of the Large Magellanic Cloud</i>	2015
co-I (PI Phil Hopkins): NASA Pleiades – 18 million core-hours <i>The Milky Way: Dark Matter & Galaxy Formation with Unprecedented Physics</i>	2014
co-PI (PI Phil Hopkins): XSEDE Stampede – 12 million core-hours <i>The Milky Way: A Billion Particles on FIRE</i>	2014

TELESCOPE OBSERVING AWARDED**(HST: 564 ORBITS, JWST: 29 HOURS, KECK: 13.5 NIGHTS, VLT: 317 HOURS)**

co-I (PI Roeland van der Marel): HST+JWST GO (Cycle 32) – 15 orbits + 2.4 hours <i>Enabling cross instrument proper motions with Draco dSph and NGC 2419</i>	2025
co-I (PI Jesse Van de Sande): VLT MUSE – 317 hours <i>GECKOS: Turning galaxy evolution on its side with deep observations of edge-on galaxies</i>	2022
co-I (PI Tony Sohn): HST GO (Cycle 28) – 48 orbits <i>Andromeda & the Seven Dwarfs: M31 Mass, Satellite Orbits, & the Nature of the Satellite Plane</i>	2020
co-I (PI Adam Smercina): HST GO (Cycle 28) – 31 orbits <i>A Benchmark Survey of Resolved Stellar Populations in the Nearest Ultra Diffuse Galaxy, F8D1</i>	2020
co-I (PI Yumi Choi): HST GO (Cycle 28) – 5 orbits <i>Near Field Cosmology with Ultra-faint Dwarfs: Patchy Reionization & Sub-Solar IMF</i>	2020
co-PI (PI Dan Weisz): HST Treasury Program (Cycle 27) – 244 orbits <i>Tracing the 6-D Orbital & Formation History of the Complete M31 Satellite System</i>	2019
co-I (PI Erik Tollerud): HST GO (Cycle 27) – 19 orbits <i>COS-SAGA: The Circumgalactic Medium of Nearby Milky Way Analogs & their Satellites</i>	2019
co-I (PI Alexie Leauthaud): Keck – 2 nights <i>Testing the Feedback-driven Breathing Mode in Dwarf Galaxies at $z \approx 0.1$</i>	2019
co-I (PI Tucker Jones): Keck – 7 nights <i>Dissecting Galaxy Formation & Testing Feedback Models on 100 pc Scales</i>	2017–2019
collaborator (PI Dan Weisz): JWST ERS (Cycle 1) – 27 hours <i>The Resolved Stellar Populations Early Release Science Program</i>	2017
co-I (PI Dan Weisz): Keck – 2.5 nights <i>Stellar Chemistry in Isolated Dwarf Galaxies</i>	2017
co-PI (PI Nitya Kallivayalil): HST Treasury Program (Cycle 24) – 164 orbits <i>Milky Way Cosmology: Laying the Foundation for Full 6-D Dynamical Mapping of the Nearby Universe</i>	2016
PI: Keck - 1 night <i>Constraining Star-Formation Quenching Mechanisms using Isolated Low-Mass Galaxies</i>	2015
co-I (PI Tony Sohn): HST GO (Cycle 23) – 14 orbits <i>The First Proper Motions of Ultra-faint Dwarf Galaxies</i>	2015
PI: Keck – 1 night <i>Testing Star-Formation Quenching using Isolated Dwarf Galaxies</i>	2014
co-I (PI Michael Balogh): Gemini South – 438 hours <i>GOGREEN Survey of Dense Galaxy Environments at $1 < z < 1.5$</i>	2014