DR. DARIA PIDHORODETSKA

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EDUCATION

University of California, Riverside — Riverside, CA
Doctor of Philosophy in Earth and Planetary Sciences — September 2020 - June 2025

Salisbury University — Salisbury, MD
Bachelor of Science in Biological Sciences — August 2014 - December 2017

RESEARCH EXPERIENCE

Earth & Planetary Sciences Department, UC Riverside — September 2020 - June 2025
Advisors: Eddie Schwieterman, Stephen Kane
Understanding Biosignatures in the Context of Exoplanet Atmospheres

- Used 3D global circulation models (GCMS) to simulate terrestrial exoplanet atmospheres and connecting these results to spectral simulations.
- Assessed the detectability of spectral features with ground- and space-based telescopes to plan for future observational missions.
- Conducted exoplanet observations to determine planetary mass measurements with the HIRES instrument at the Keck Observatory.

Planetary Systems Lab, NASA Goddard Space Flight Center — March 2018 - August 2020
Advisors: Thomas Fauchez, Geronimo Villanueva, Elisa Quintana, Shawn Domagal-Goldman
Detection and Characterization of Terrestrial Exoplanets and their Atmospheres, Data + Modeling

- Simulated the feasibility of detecting and characterizing terrestrial exoplanet atmospheres with analysis via radiative transfer models.
- Used the 3-D Global Climate Model ExoCAM to constrain the parameter space of the habitable zone.
- Trained as an observer on Keck HIRES to conduct follow-up observations of exoplanets to determine their masses.
- Performed optical photometry with Kepler/K2/TESS datasets in addition to the use of planet finding and validation software for light curve creation.

Department of Biological Sciences, Salisbury University — September 2016 - December 2017
Advisor: Eugene Williams
Synthesis of Lipids and Analysis of their Chirality in the Context of Astrochemistry

- Developed a methodology to study lipid chirality in the context of astrochemistry/astrobiology. Responsible for preparing, storing, and performing multiple tests such as freeze/dry cycles on a variety of lipids, as well as deciding which lipids to use to maintain the scope of the project.
- Used various teaching methods including the development of a hardbound manual and one-on-one demonstrations to train new students to continue the project upon graduation.

HONORS AND AWARDS

RHG Exceptional Achievement for Science Award, NASA 2022

Honorable Mention, National Science Foundation Graduate Research Fellowship Program 2022

Dean's Distinguished Fellowship Award, University of California, Riverside 2020

GradEdge/JumpStart Summer Diversity Award, University of California, Riverside 2020

Dean's List, Salisbury University 2017

Delegate Scholarship, Maryland Higher Education Commission 2016

FIRST-AUTHORED PUBLICATIONS

Pidhorodetska, D., Schwieterman, E.W., Fauchez, T.J., Turbet, M., May 2025, Accepted with Revisions, AAS Journals
High CO_2 Climates and Observables in the Outer Habitable Zone (OHZ)

Pidhorodetska, D., Kane, S.R., Gilbert, E.A., Barclay, T., Polanski, A.S., Hill, M. L., et al. Sept 2024, AJ (https://iopscience.iop.org/article/10.3847/1538-3881/ad6901)
The TESS-Keck Survey. XXII. A sub-Neptune Orbiting TOI-1437

Pidhorodetska, D., Moran, S.E., Schwieterman, E.W., Fauchez, T.J., Quintana, E.V., et al. Oct 2021, AJ (https://iopscience.iop.org/article/10.3847/1538-3881/ac1171/meta)
L 98-59: a Benchmark System of Terrestrial Planets for Future Atmospheric Characterization

Pidhorodetska, D., Fauchez, T.J., Villanueva, G.L., Domagal-Goldman, S.D., Kopparapu, R.K., Aug 2020, ApJ (https://doi.org/10.3847/2041-8213/aba4a1)
Detectability of Molecular Signatures on TRAPPIST-1e through Transmission Spectroscopy Simulated for Future Space-Based Observatories

CO-AUTHORED PUBLICATIONS

Chontos et al. inc. **Pidhorodetska, D.** Submitted (https://arxiv.org/abs/2402.07893)
The TESS-Keck Survey XXI: 13 New Planets and Homogeneous Properties for 21 Subgiant Systems

Brinkman et al. inc. **Pidhorodetska, D.** Submitted (https://arxiv.org/abs/2410.00213)
The Compositions of Rocky Planets in Close-in Orbits Tend to be Earth-Like

Van Zandt et al. inc. **Pidhorodetska, D.** Submitted
The TESS-Keck Survey XXIV: Outer Giants may be More Prevalent in the Presence of Inner Small Planets

Barclay et al. inc. **Pidhorodetska, D.** May 2025, AJ
(https://iopscience.iop.org/article/10.3847/1538-3881/ada5f6)
The Transmission Spectrum of the Potentially Rocky Planet L 98-59 c

Isaacson et al. inc. **Pidhorodetska, D.** Oct 2024, ApJS
(https://iopscience.iop.org/article/10.3847/1538-4365/ad676c)
The California Legacy Survey. V. Chromospheric Activity Cycles in Main-sequence Stars

Schwieterman et al. inc. **Pidhorodetska, D.** Sept 2024, ApJ
(https://iopscience.iop.org/article/10.3847/1538-4357/ad4ce8)
Artificial Greenhouse Gases as Exoplanet Technosignatures

Polanski et al. inc. **Pidhorodetska, D.** May 2024, ApJS
(https://iopscience.iop.org/article/10.3847/1538-4365/ad4484)
The TESS-Keck Survey. XX. 15 New TESS Planets and a Uniform RV Analysis of All Survey Targets

Lange et al. inc. **Pidhorodetska, D.** May 2024, AJ
(https://iopscience.iop.org/article/10.3847/1538-3881/ad34d9)
The TESS-Keck Survey. VII. A Superdense Sub-Neptune Orbiting TOI-1824

Rubenzahl et al. inc. **Pidhorodetska, D.** April 2024, AJ
(https://iopscience.iop.org/article/10.3847/1538-3881/ad28bb)
The TESS-Keck Survey. XII. A Dense 1.8 Rearth Ultra-Short-Period Planet Possibly Clinging to a High-Mean-Molecular-Weight Atmosphere After the First Gyr

Hill et al. inc. **Pidhorodetska, D.** March 2024, AJ
(https://iopscience.iop.org/article/10.3847/1538-3881/ad2765)
The TESS-Keck Survey. XIX. A Warm Transiting Sub-Saturn Mass Planet and a non-Transiting Saturn Mass Planet Orbiting a Solar Analog

Angerhausen, D., **Pidhorodetska, D.**, et al. Feb 2024, AJ
(https://iopscience.iop.org/article/10.3847/1538-3881/ad1f4b)
Large Interferometer For Exoplanets (LIFE): XII. The Detectability of Capstone Biosignatures in the Mid-Infrared – Sniffing Exoplanetary Laughing Gas and Methylated Halogens

Murphy et al. inc. **Pidhorodetska, D.** Oct 2023, AJ
(https://iopscience.iop.org/article/10.3847/1538-3881/ace2ca)
The TESS-Keck Survey. XVI. Mass Measurements for 12 Planets in Eight Systems

Dai et al. inc. **Pidhorodetska, D.** Aug 2023, AJ
(https://iopscience.iop.org/article/10.3847/1538-3881/acdee8)
A Mini-Neptune Orbiting the Metal-poor K Dwarf BD+29 2654

Hon et al. inc. **Pidhorodetska, D.** July 2023, Nature
(https://www.nature.com/articles/s41586-023-06029-0)
A close-in giant planet escapes engulfment by its star

MacDougall et al. inc. **Pidhorodetska, D.** July 2023, AJ
(https://iopscience.iop.org/article/10.3847/1538-3881/acd557)
The TESS-Keck Survey. XV. Precise Properties of 108 TESS Planets and Their Host Stars

Zink et al. inc. **Pidhorodetska, D.** June 2023, AJ
(https://iopscience.iop.org/article/10.3847/1538-3881/acd24c)
Scaling K2. VI. Reduced Small-planet Occurrence in High-galactic-amplitude Stars

Van Zandt et al. inc. **Pidhorodetska, D.** Feb 2023, AJ
(https://iopscience.iop.org/article/10.3847/1538-3881/aca6ef/pdf)
TESS-Keck Survey. XIV. Two Giant Exoplanets from the Distant Giants Survey

Damiano et al. inc. **Pidhorodetska, D.** Nov 2022, AJ
(https://iopscience.iop.org/article/10.3847/1538-3881/ac9472/pdf)
A transmission spectrum of the sub-Earth planet L98-59 b in 1.1-1.7 micron

Schwieterman, E.W., Olson, S.L., **Pidhorodetska, D.**, et al. Oct 2022, ApJ
(https://iopscience.iop.org/article/10.3847/1538-4357/ac8cfb/pdf)
Evaluating the Plausible Range of N_2O Biosignatures on Exo-Earths: An Integrated Biogeochemical, Photochemical, and Spectral Modeling Approach

MacDougall et al. inc. **Pidhorodetska, D.** Sept 2022, AJ
(https://iopscience.iop.org/article/10.3847/1538-3881/ac7ce1/pdf)
The TESS-Keck Survey. XIII. An Eccentric Hot Neptune with a Similar-mass Outer Companion around TOI-1272

Fauchez et al. inc. **Pidhorodetska, D.** June 2021, PSJ (https://iopscience.iop.org/article/10.3847/PSJ/abf4df)
TRAPPIST Habitable Atmosphere Intercomparison (THAI) Workshop Report

Gilbert et al. inc. **Pidhorodetska, D.** Sept 2020, ApJ (https://doi.org/10.3847/1538-3881/aba4b2)
An Earth-sized Planet in the Habitable Zone of a Nearby Cool Star: Validation of the System

Fauchez, T.J., Villanueva, G.L., Schwieterman, E.W., Turbet, M., Arney, G., **Pidhorodetska, D.**, et al. Jan 2020, Nature Astronomy (https://www.nature.com/articles/s41550-019-0977-7)
Sensitive Probing of Exoplanetary Oxygen via Mid Infrared Collisional Absorption

Fauchez et al. inc. **Pidhorodetska, D.** Dec 2019, ApJ (https://doi.org/10.3847/1538-4357/ab5862)
Impact of Clouds and Hazes on the Simulated JWST Transmission Spectra of Habitable Zone Planets in the TRAPPIST-1 System

Kostov et al. inc. **Pidhorodetska, D.** July 2019, AJ (https://doi.org/10.3847/1538-3881/ab2459)
The L 98-59 System: Three Transiting, Terrestrial-Sized Planets Orbiting a Nearby M-dwarf

FUNDED PROPOSALS

PI, Future Investigators in NASA Earth and Space Science and Technology (FINESST) 2022
High CO_2 Climates and Observables in the Outer Habitable Zone

Co-Investigator, HST-GO-16448 (8 Orbits) 2020
Confirming a Tentative Detection of an Atmosphere Around a Potentially Rocky Planet, PI: T. Barclay

Co-Investigator, HST-GO-959 (20 Orbits) 2019
Searching for Secondary Atmospheres in a System of Benchmark Worlds, PI: T. Barclay

INVITED TALKS

Geneva Observatory Laboratory Seminar, Geneva, Switzerland September 2019
From Climates to Biosignatures: Comparative Planetology within the TRAPPIST-1 System

Salisbury University Department of Biological Sciences Seminar September 2019
The Search for Life Beyond our Solar System: How NASA is Taking on its Greatest Challenge Yet

CONTRIBUTED TALKS AND POSTERS

Exoplanets 5 Conference, Leiden, Netherlands (Poster) June 2024
High CO_2 Climates and Observables in the Outer Habitable Zone (OHZ)

Astrobiology Science Conference, Providence, RI (Talk) May 2024
High CO_2 Climates and Observables in the Outer Habitable Zone (OHZ)

Astrobiology Graduate Conference, San Diego, CA (Poster) July 2023
L 98-59: A Benchmark System of Terrestrial Exoplanets for Future Atmospheric Characterization

AAS Winter Meeting, Virtual (Talk) January 2021
L 98-59: A Benchmark System of Terrestrial Exoplanets for Future Atmospheric Characterization

Planets 2020 Meeting, Santiago, Chile (Poster) March 2020
Detectability of Habitability Signatures on TRAPPIST-1e Simulated for Future Space-based Observatories

Exoplanets in our Backyard Meeting, Houston, TX (Poster) February 2020
L 98-59: A Benchmark System of Terrestrial Exoplanets for Future Atmospheric Characterization

AAS Winter Meeting, Honolulu, HI (Poster) January 2020
Diversity of Exoplanets with LUVOIR I: Optical and NIR

DPS/EPSC Joint Meeting, Geneva, Switzerland (Talk) September 2019
Detectability of Habitability Signatures on TRAPPIST-1e with Future Space-based Observatories

Astrobiology Science Conference, Seattle, WA (Talk) June 2019
Detectability of Habitability Signatures on TRAPPIST-1e with Future Space-based Observatories

TRAPPIST-1 Conference, University of Liege, Belgium (Talk) June 2019
Detectability of Habitability Signatures on TRAPPIST-1e with Future Space-based Observatories

AGU Fall Meeting, Washington D.C. (Poster) December 2018
Impact of Background N_2 Pressure on the Habitability of Tidally Locked Rocky Exoplanets Around Cool Stars

Salisbury University Biochemistry Laboratory (Poster) 2017
Transformation, Expression, and Purification of Green Fluorescent Protein

Salisbury University Student Research Conference (Poster) 2016
Docosahexaenoic Acid (DHA) Inhibits Metastasis in B16 Cell Lines by Altering Membrane Molecular Order and Cell Adhesion Potentials

LEADERSHIP AND SERVICE

HWO Living Worlds Working Group Member	Present
Communications Lead for LUVOIR Mission Concept	2019-2022
NASA Panel Service as an Executive Secretary	2019, 2020
Sellers Exoplanet Environments Collaboration (SEEC) Local Organizing Committee	2019