

# DARIA PIDHORODETSKA

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## EDUCATION

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**University of California, Riverside**

PhD Candidate, Earth and Planetary Sciences Department

September 2020 - Present

Expected June 2025

**Salisbury University**

Bachelor of Science in Biological Sciences

August 2014 - December 2017

## RESEARCH EXPERIENCE

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**Earth & Planetary Sciences Department, University of California, Riverside**

Present

Advisors: Eddie Schwieterman, Stephen Kane

*Understanding Biosignatures in the Context of Exoplanet Atmospheres*

- Using 3D global circulation models (GCMS) to simulate terrestrial exoplanet atmospheres and connecting these results to spectral simulations.
- Assessing the detectability of spectral features with ground- and space-based telescopes to plan for future observational missions.
- Conducting 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.
- 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.

## AWARDS AND SCHOLARSHIPS

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RHG Exceptional Achievement for Science Award, NASA

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

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- Pidhorodetska, D.**, Schwieterman, E.W., Fauchez, T.J., Turbet, M., In prep  
*High CO<sub>2</sub> Climates and Observables in the Outer Habitable Zone (OHZ) Part I.*
- 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

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- 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.** Accepted, AJ (<https://arxiv.org/abs/2301.10866>)  
*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<sub>2</sub>O 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*
- Faucher 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*
- Faucher, 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

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PI, Future Investigators in NASA Earth and Space Science and Technology (FINESST) 2022  
*High CO<sub>2</sub> 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

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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

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Exoplanets 5 Conference, Leiden, Netherlands (Poster) June 2024  
*High CO<sub>2</sub> Climates and Observables in the Outer Habitable Zone (OHZ)*

Astrobiology Science Conference, Providence, RI (Talk) May 2024  
*High CO<sub>2</sub> 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
<i>Impact of Background N<sub>2</sub> Pressure on the Habitability of Tidally Locked Rocky Exoplanets Around Cool Stars</i>	
Salisbury University Biochemistry Laboratory (Poster)	2017
<i>Transformation, Expression, and Purification of Green Fluorescent Protein</i>	
Salisbury University Student Research Conference (Poster)	2016
<i>Docosahexaenoic Acid (DHA) Inhibits Metastasis in B16 Cell Lines by Altering Membrane Molecular Order and Cell Adhesion Potentials</i>	

## LEADERSHIP AND SERVICE

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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