# DARIA PIDHORODETSKA

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University of California, Riverside


## EDUCATION

**University of California, Riverside** September 2020 - Present
PhD Candidate, Earth and Planetary Sciences Department Expected May 2025

**Salisbury University** August 2014 - December 2017
Bachelor of Science in Biological Sciences

## RESEARCH EXPERIENCE

**Earth & Planetary Sciences Department, University of California, Riverside** Present
Advisors: Eddie Schwieterman, Stephen Kane
*Understanding Biosignatures in the Context of Exoplanet Atmospheres*

- Using photochemistry to spectral simulations of exoplanet atmospheres while analyzing the effects of stellar activity on planetary habitability.
- Assessing the detectability of spectral features with ground- and space-based telescopes to plan for future observational missions.
- Conducting exoplanet observations 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

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

## PUBLICATIONS

Rubenzahl et al. inc. **Pidhorodetska, D.** 2024, AJ
*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.** 2024, AJ (https://arxiv.org/abs/2402.03498)
*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. 2024, AJ (https://arxiv.org/abs/2401.08492)
*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.** 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.** 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.** 2023, Nature (https://www.nature.com/articles/s41586-023-06029-0)
*A close-in giant planet escapes engulfment by its star*

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

MacDougall et al. inc. **Pidhorodetska, D.** 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*

Van Zandt et al. inc. **Pidhorodetska, D.** 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*

MacDougall et al. inc. **Pidhorodetska, D.** 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*

Schwieterman, E.W., Olson, S.L., **Pidhorodetska, D.**, et al. 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*

Damiano et al. inc. **Pidhorodetska, D.** 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*

**Pidhorodetska, D.**, Moran, S.E., Schwieterman, E.W., Fauchez, T.J., Quintana, E.V., et al. 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*

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

**Pidhorodetska, D.**, Fauchez, T.J., Villanueva, G.L., Domagal-Goldman, S.D., Kopparapu, R.K., 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*

Gilbert et al. inc. **Pidhorodetska, D.** 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. 2019, 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.** 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.** 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

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, Texas (Poster) February 2020
*L 98-59: A Benchmark System of Terrestrial Exoplanets for Future Atmospheric Characterization*

AAS Winter Meeting, Honolulu, Hawaii (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, Washington (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

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| Communications Lead for LUVOIR Mission Concept | Present |
| LUVOIR Exoplanets Working Group Member | Present |
| Exoplanet Program (ExoPAG) Science Analysis Group 21 Member | Present |
| NASA Panel Service as an Executive Secretary | 2019, 2020 |
| Sellers Exoplanet Environments Collaboration (SEEC) Local Organizing Committee | 2019 |