

Sebastian Zieba

Curriculum Vitae

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Appointments

Sept. 2024 – present **NASA Sagan Fellow**, *Center for Astrophysics | Harvard & Smithsonian*, Cambridge, USA

Proposal title: Characterization of rocky exoplanet surfaces and atmospheres in the JWST era

July 2024 – Aug. 2024 **Postdoc**, *Max-Planck Institute for Astronomy (APEX Department)*, Heidelberg, Germany

Education

2020 – 2024 **PhD**, *Max-Planck Institute for Astronomy (APEX Department)*, Heidelberg, Germany & *Leiden Observatory*, Leiden, Netherlands

Supervisor: Prof. Dr. Laura Kreidberg

Supervisor: Prof. Dr. Ignas A.G. Snellen

Thesis: Pushing the Characterization of Exoplanet Atmospheres Down to Temperate Rocky Planets in the Era of JWST ([link to thesis](#)).

defended on June 25th 2024 with distinction (*cum laude*)

2017 – 2020 **Master Physics**, *Leopold Franzens University*, Innsbruck, Austria.

Thesis: *Time delay analysis of the δ Scuti pulsations in the exoplanet host star β Pictoris based on space and ground-based photometry*

Supervisor: Univ.-Prof. Mag. Dr. Konstanze Zwintz

Co-Supervisor: Associate Professor Dr. M.A. Matthew Kenworthy

2013 – 2017 **Bachelor Physics**, *Leopold Franzens University*, Innsbruck, Austria.

Supervisor: Univ.-Prof. Dr. Norbert Przybilla

First-author Publications

Full list of co-authored publications can be found in the [Astrophysics Data System](#); h-index: 19.

- **S. Zieba**, L. Kreidberg, B. P. Coy, et al., *The dark and featureless surface of rocky exoplanet LHS 3844 b from JWST mid-infrared spectroscopy*, *Nature Astronomy*, May 2026. [Citations: 0]
- **S. Zieba**, K. Zwintz, M. Kenworthy, et al., *The β Pictoris b Hill sphere transit campaign. II. Searching for the signatures of the β Pictoris exoplanets through time delay analysis of the δ Scuti pulsations*, *Astronomy and Astrophysics*, 687, A309, July 2024. [Citations: 2]
- **S. Zieba**, L. Kreidberg, E. Ducrot, et al., *No thick carbon dioxide atmosphere on the rocky exoplanet TRAPPIST-1 c*, *Nature*, 620, 746, August 2023. [Citations: 211]
- **S. Zieba**, L. Kreidberg, *PACMAN: A pipeline to reduce and analyze Hubble Wide Field Camera 3 IR Grism data*, *The Journal of Open Source Software*, 7, 4838, December 2022. [Citations: 5]
- **S. Zieba**, M. Zilinskas, L. Kreidberg, et al., *K2 and Spitzer phase curves of the rocky ultra-short-period planet K2-141 b hint at a tenuous rock vapor atmosphere*, *Astronomy and Astrophysics*, 664, A79, August 2022. [Citations: 74]
- **S. Zieba**, K. Zwintz, M. A. Kenworthy, et al., *Transiting exocomets detected in broadband light by TESS in the β Pictoris system*, *Astronomy and Astrophysics*, 625, L13, May 2019. [Citations: 68]

Fellowships & Awards

- 2024 *NASA Hubble Fellowship Program (NHFP), Sagan Fellow* at the Smithsonian Astrophysics Observatory (SAO)
- 2019 *Student Poster Competition Winner* at TESS Science Conference I
- 2019 *Studienförderungspreis 2019 des Deutschen Freundeskreises der Universitäten in Innsbruck e.V.*

Accepted observing proposals (as PI)

- 2023 *Exploring the boundary between rocky and gaseous planets with WASP-47 e.*
JWST Cycle 2 program — GO 3615
- 2023 *The search for regolith on the airless exoplanet LHS 3844 b.*
JWST Cycle 2 program — GO 4008

Accepted observing proposals (as co-PI)

- 2022 *Inside out: detecting a rock vapor atmosphere on the lava world TOI-2431 b.*
HST Cycle 29 program — GO 16660

Accepted observing proposals (as Co-I, selection)

- 2025 *Exo-Geology: Surface Spectral Features from a Rocky Exoplanet*
JWST Cycle 4 program — GO 7953
- 2025 *Mapping the Atmosphere and Interior of HAT-P-13b: The Next Benchmark for Exoplanetary Science*
JWST Cycle 4 program — GO 8233
- 2025 *Surveying Hellish Worlds: Lava Planets as Time Capsules of Thermal Evolution*
JWST Cycle 4 program — GO 8864
- 2023 *TRAPPIST-1 Planets: Atmospheres Or Not?*
JWST Cycle 2 program — GO 3077
- 2021 *A Hell of a Phase Curve: Mapping the Surface and Atmosphere of a Lava Planet K2-141b.*
JWST Cycle 1 program — GO 2347
- 2019 *Hunting for exocomets transiting the young naked-eye star 5 Vulpeculae.*
CHEOPS AO-1 2 program — ID 021

Grants

- 2025 JWST General Observers (GO) Program:
16,000 USD awarded to the project *Mapping the Atmosphere and Interior of HAT-P-13b: The Next Benchmark for Exoplanetary Science* (PI: Yamila Miguel, US-admin PI: Sebastian Zieba)

Software

- 2020 - present PACMAN — Pipeline to reduce and analyze HST/WFC3 data
Lead developer, [hosted on GitHub](#)

(Invited) Talks and Seminars (selection)

- 2019 Conference Talk: *TESS Science Conference I*, Cambridge, USA ([video link](#))
Student Poster Competition Winner Talk: Transiting exocomets detected in broadband light by TESS in the β Pictoris system
- 2021 Conference Talk: *Europlanet Science Congress (EPSC)* ([video link](#))
- 2022 CEHW Seminar at Penn State University
Atmospheres of lava planets: a case study for K2-141 b
- 2022 Conference Talk: *Rocky Worlds 2*, Oxford, UK
- 2023 Conference Talk: *Exoclimes VI*, Exeter, UK
- 2023 JPL Astrophysics Colloquium
The Frontier of Rocky Planet Characterization
- 2024 Conference Talk: *Extreme Solar Systems V*, Christchurch, NZ
- 2024 Conference Talk (invited): *European Geosciences Union (EGU) General Assembly 2024*, Vienna, Austria
- 2024 Conference Talk: *Exoplanets 5*, Leiden, Netherlands
- 2024 CfA Colloquium ([video link](#))
Characterizing the surfaces of exoplanets with JWST
- 2025 Conference Talk: *Aspen Center for Physics: Atmospheric characterization of rocky to giant exoplanets in thermal emission with JWST*
- 2025 Conference Talk: *AAS 246*, Anchorage, USA
- 2025 Santa Barbara Astro Lunch Talk
Characterizing the surfaces of exoplanets with JWST
- 2025 Planetary Lunch Seminar at MIT
The Frontier of Rocky Exoplanet Characterization with JWST — Their Atmospheres and Surfaces in Emission

Community Service (selection)

- 2025 - Organizer of the Exoplanet Pizza Lunch at the Center for Astrophysics | Harvard & Smithsonian present
- 2025 - Reviewer for UK Research and Innovation (UKRI) proposals present
- 2025 - Panel member and reviewer of ESA telescope proposals present
- 2024 - Reviewer for The Astrophysical Journal Letters (ApJL) Journal present

Teaching Experience

- May 2018 Substitute Lecturer for Univ.-Prof. Mag. Dr. Paul Scheier
Topic: Introduction to exoplanets
- Jan 2019 Substitute Lecturer for Univ.-Prof. Mag. Dr. Konstanze Zwintz
Topic: Introduction to exoplanets
- May 2019 Substitute Lecturer for Univ.-Prof. Mag. Dr. Konstanze Zwintz
Topic: Telescopes in Space: Kepler and TESS

Public Outreach Talks

- 2011 Science Day at the *Salzburg University of Education Stefan Zweig*
Talk: Planetology of the Moon and Mars as seen with *Google Maps*
- 2012 Science Day at the *Salzburg University of Education Stefan Zweig*
Talk: How do you find an exoplanet?
- 2013 Science Day at the *Salzburg University of Education Stefan Zweig*
Talk: Exoplanets - The search for the second Earth
- 2013 Astronomical Society of Salzburg
Talk: Exoplanets
- 2022 Private grammar school St. Rupert in Salzburg
Talk: Exoplanets and the first results from JWST

Interviews

- 2024 [Looking for atmospheres in the ultimate quest for extraterrestrial life](#)
Interview with Manon Boot on my accomplishments during my postdoctoral position at the MPIA and Leiden Observatory.