

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: 18.

- **Zieba, S.**, Zwintz, K., Kenworthy, M., 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", *A&A*, 687, A309 (2024) [Citations: 2]
- **Zieba, S.**, Kreidberg, L., Ducrot, E., et al., "No thick carbon dioxide atmosphere on the rocky exoplanet TRAPPIST-1 c", *Nature*, 620, 746 (2023) [Citations: 163]
- **Zieba, S.**, and Kreidberg, L., "PACMAN: A pipeline to reduce and analyze Hubble Wide Field

Camera 3 IR Grism data", JOSS, 7, 4838 (2022) [Citations: 4]

- **Zieba, S.**, Zilinskas, M., Kreidberg, L., et al., "K2 and Spitzer phase curves of the rocky ultra-short-period planet K2-141 b hint at a tenuous rock vapor atmosphere", A&A, 664, A79 (2022) [Citations: 61]
- **Zieba, S.**, Zwintz, K., Kenworthy, M. A. Kennedy, G. M., "Transiting exocomets detected in broadband light by TESS in the β Pictoris system", A&A, 625, L13 (2019) [Citations: 65]

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.*

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)

- 2024 - present Reviewer for The Astrophysical Journal Letters (ApJL) Journal
- 2025 - present Reviewer for UK Research and Innovation (UKRI) proposals
- 2025 - present Panel member and reviewer of ESA telescope proposals

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