

# Sebastian Zieba

## Curriculum Vitae

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## Education

- 2013 – 2017 **Bachelor Physics**, *Leopold Franzens University, Innsbruck, Austria.*  
Thesis: *The Titius Bode law - applied on exoplanetary systems*  
Supervisor: Univ.-Prof. Dr. Norbert Przybilla
- 2017 – 2020 **Master Physics**, *Leopold Franzens University, Innsbruck, Austria.*  
Thesis: *Time delay analysis of the  $\delta$  Scuti pulsations in the exoplanet host star  $\beta$  Pictoris based on space and ground-based photometry*  
Supervisor: Univ.-Prof. Mag. Dr. Konstanze Zwintz  
Co-Supervisor: Associate Professor Dr. M.A. Matthew Kenworthy
- 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*)
- July 2024 – present **Postdoc**, *Max-Planck Institute for Astronomy (APEX Department), Heidelberg, Germany*

## First-author Publications

- **Zieba, S.**, Zwintz, K. Kenworthy, M., et al., "The  $\beta$  Pictoris b Hill Sphere Transit Campaign II. Searching for the signatures of the  $\beta$  Pictoris exoplanets through time delay analysis of the  $\delta$  Scuti pulsations", (accepted)
- **Zieba, S.**, Kreidberg, L., Ducrot, E., et al., "No thick carbon dioxide atmosphere on the rocky exoplanet TRAPPIST-1 c", *Nature*, 620, 746 (2023)
- **Zieba, S.**, and Kreidberg, L., et al., "PACMAN: A pipeline to reduce and analyze Hubble Wide Field Camera 3 IF Grism data", *JOSS*, 7, 4838 (2022)
- **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)
- **Zieba, S.**, Zwintz, K. Kenworthy, M. A. Kennedy, G. M., "Transiting exocomets detected in broadband light by TESS in the  $\beta$  Pictoris system", *A&A*, 625, L13 (2019)

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## Fellowships

2024 *NASA Hubble Fellowship Program (NHFP), Sagan Fellow* at the Smithsonian Astrophysics Observatory (SAO)

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## Awards

2024 *Best Stage Entrance Award* at Extreme Solar Systems V

2019 *Student Poster Competition Winner* at TESS Science Conference I

2019 Studienförderungspreis 2019 des Deutschen Freundeskreises der Universitäten in Innsbruck e.V.

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## Accepted observing proposals (as PI)

2023 JWST Cycle 2 PROGRAM: *Exploring the boundary between rocky and gaseous planets with WASP-47 e.*

2023 JWST Cycle 2 PROGRAM: *The search for regolith on the airless exoplanet LHS 3844 b.*

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## Accepted observing proposals (as co-PI)

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

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## Accepted observing proposals (as Co-I, selection)

2023 JWST Cycle 2 PROGRAM: *TRAPPIST-1 Planets: Atmospheres Or Not?*

2021 JWST Cycle 1 PROGRAM: *A Hell of a Phase Curve: Mapping the Surface and Atmosphere of a Lava Planet K2-141b.*

2019 CHEOPS AO-1 PROGRAM: *Hunting for exocomets transiting the young naked-eye star 5 Vulpeculae.*

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## Attendance at Conferences, Workshops and Summer Schools (selection)

May 2019 Workshop: *ExoComets: Understanding the Composition of Planetary Building Blocks*, Leiden, Netherlands

July - Aug 2019 Conference: *TESS Science Conference I*, Boston, USA (Contribution: Poster)

March 2021 Workshop: *Exoplanet atmosphere characterization: from HST and Spitzer to JWST*, online (Contribution: Talk)

Sept 2021 Conference: *Europlanet Science Congress (EPSC)*, online (Contribution: Talk)

May 2022 Conference: *Exoplanets IV*, Las Vegas, USA (Contribution: Poster)

July 2022 Conference: *Rocky Worlds 2*, Oxford, UK (Contribution: Talk)

- Sep 2022 Workshop: *Diversity of Rocky Planets 2022*, Leiden, Netherlands
- June 2023 Conference: *Exoclimes VI*, Exeter, UK (Contribution: Talk)
- July 2023 Workshop: *2023 Sagan Exoplanet Summer Hybrid Workshop Characterizing Exoplanet Atmospheres: The Next Twenty Years*, Pasadena, USA
- March 2024 Conference: *Extreme Solar Systems V*, Christchurch, NZ (Contribution: Talk)
- April 2024 Conference: *European Geosciences Union (EGU) General Assembly 2024*, Vienna, Austria (Contribution: Invited Talk)
- June 2024 Conference: *Exoplanets 5*, Leiden, Netherlands (Contribution: Talk)

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## Given Talks

- 2019 TESS Science Conference I  
**Student Poster Competition Winner Talk: Transiting exocomets detected in broadband light by TESS in the  $\beta$  Pictoris system**  
 Video Link: <https://youtu.be/KTRbjX1jTuI>
- 2021 Exoplanet atmosphere characterization: from HST and Spitzer to JWST  
**Optical and Infrared Phase Curves of the Lava Planet K2-141 b**  
 Video Link: <https://vimeo.com/523742466/4644d3e974>
- 2021 Europlanet Science Congress (EPSC)  
**Optical and Infrared Phase Curves of the Lava Planet K2-141 b**  
 Video Link: <https://vimeo.com/596172827>
- 2022 Rocky Worlds 2  
**K2 and Spitzer phase curves of the rocky ultra-short-period planet K2-141 b hint at a tenuous rock vapor atmosphere**
- 2022 CEHW Seminar at Penn State University  
**Atmospheres of lava planets: a case study for K2-141 b**
- 2023 Exoclimes VI  
**Detection of thermal emission from TRAPPIST-1 c with JWST**
- 2023 JPL Astrophysics Colloquium  
**The Frontier of Rocky Planet Characterization**

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## 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

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## 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**