Henrik Knierim

curriculum vitae

University of Zurich
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Education

2015–2019 **Bachelor of Physics**, *Ruprecht Karl University of Heidelberg*, Heidelberg
Bachelor's thesis: Planet population synthesis driven by pebble accretion in different disk environments—Supervisor: Prof. Dr. Bertram Bitsch, Max Planck Institute for Astronomy

2018–2019 **Exchange Student**, *Kyoto University*, Kyoto

2019–2021 **Master of Physics**, *Ruprecht Karl University of Heidelberg*, Heidelberg
Master's thesis: On the Shallowness of Atmospheric Circulation in Hot Jupiters—Supervisors: Prof. Dr. Konstantin Batygin, Caltech; Prof. Dr. Bertram Bitsch, Max Planck Institute for Astronomy

Since 2022 **PhD Student in Theoretical Astrophysics**, *University of Zurich*, Zurich
Research focus: Mixing in giant planets and the link between their composition and formation history—Supervisor: Prof. Dr. Ravit Helled, University of Zurich

Research Interests

Planetary interiors, planetary evolution, gas giant planets, mixing processes in giant planets, and Ohmic dissipation in planetary atmospheres

Experience

Vocational

2015–2016 **Independent Entrepreneur**, Lübeck
E-commerce sales
Web design and digital promotion
Event representation for Konami K.K.

2016–2018 **Co-Founder and Managing Director**, *Schön & Knierim GbR*, Bad Schwartau
E-commerce operations
Agency services for online entrepreneurs
Team and client management

2019 **Research Assistant**, *Max Planck Institute for Astronomy*, Heidelberg
Topic: Numerical simulations of the opacity in protoplanetary disks—Supervisors: Dr. Sofia Savvidou; Prof. Dr. Bertram Bitsch

Miscellaneous

2009 **Intern**, *Institute of Physics*, Lübeck
Two-week internship at the Institute of Physics at the University of Lübeck

2014 **Intern**, *Dräger Medical GmbH*, Lübeck
One-week internship in the research and development department for gas sensors

2019 **Intern**, *Max Planck Institute for Astronomy*, Heidelberg
Topic: Influence of Ohmic dissipation on the inflation of hot Jupiters—Supervisors: Prof. Dr. Konstantin Batygin, Caltech; Prof. Dr. Bertram Bitsch, Max Planck Institute for Astronomy

Languages

German Native
English Fluent
Japanese Intermediate
French Intermediate

Professional Service

Referee for *The Astrophysical Journal Letters* and *Nature Communications*

Organizer of the *University of Zurich Planetary Seminar*

Memberships: NCCR PlanetS, JWST Program *Red Dwarfs and the Seven Giants: First Insights into the Atmospheres of Giant Exoplanets around M-dwarf Stars*

Teaching Experience

Supervised students: Lucas Le Gall (Aix-Marseille University), Julian Berg (Leibniz University Hannover)

Planet Formation, Teaching Assistant (Fall 2022, Fall 2023, Fall 2025), University of Zurich

Computational Astrophysics, Teaching Assistant, (Fall 2023, Fall 2024), University of Zurich

The Universe: Contents, Origin, Evolution and Future, Teaching Assistant, (Spring 2023, Spring 2024), University of Zurich

High Performance Computing, Teaching Assistant (Fall 2024), University of Zurich

The Sun and Planets, Teaching Assistant (Spring 2022, Spring 2024), University of Zurich

Computational Methods in Radiative Transfer, Teaching Assistant (Spring 2025), University of Zurich

Proseminar Astrophysics, Teaching Assistant (Fall 2025), University of Zurich

Outreach

Volunteer for the NCCR PlanetS outreach booth at Fantasy Basel (4x)

Volunteer for the Children's University of Zurich

Volunteer for EPSC Goes Live for Schools 2024

Volunteer for the University of Zurich Science Info Day

Volunteer for the University of Zurich Open Days

Volunteer for Kyoto Minamiouchi Elementary School

Presentations and Contributions

Invited Talks and Visits

2026 From Galaxies to Planets: an elemental journey, Ringberg

2025 ExoCoffee, MPIA, Heidelberg

2025 Planetary Seminar, NAOJ, Tokyo

2025 EDM I : Exoplanet Dynamics & Modeling, Caltech, Pasadena

2025 GPS Division Seminar (Mar), Caltech, Pasadena

2025 Invited Visit (Jan), GPS, Caltech, Pasadena

2025 Institute Seminar of the Astrophysics Research Center, Open University of Israel, Ra'anana

2024 Challenge Accepted: Linking Planet Formation with Present-Day Atmospheres, Heidelberg

2022 Planet formation in accretion discs group, Max Planck Institute for Astronomy, Heidelberg

2022 TAPS: theoretical astrophysics and planet formation, Bern

2021 The formation of the solar system, Ringberg

Conference Talks

2025 51 Peg b 30th Birthday: Cool Giant Exoplanets & Their Systems, Observatoire de Haute-Provence

2025 PlanetS General Assembly, Neuchâtel

2024 PlanetS Junior Research Assembly, Murten

2022 SPP 1992 - Exploring the diversity of Exoplanets, Berlin

2022 Ariel Consortium Meeting, Paris

2022 PlanetS Junior Research Assembly, Interlaken

Conference Posters

2024 Europlanet Science Congress, Berlin

2024 NCCR PlanetS General Assembly (poster contest finalist), Engelberg

2023 Protostars and Planets VII, Kyoto

Publications

First Author Publications

2025 **H. Knierim**, K. Batygin, R. Helled, L. Morf, and Fred C. Adams. Further constraints on Jupiter's primordial structure. *In press in Astronomy and Astrophysics*, page arXiv:2512.03961, December 2025.

2025 **H. Knierim** and R. Helled. Unraveling the origin of giant exoplanets: Observational implications of convective mixing. *Astronomy and Astrophysics*, 698:L1, June 2025.

2024 **H. Knierim** and Ravit Helled. Convective Mixing in Gas Giant Planets with Primordial Composition Gradients. *The Astrophysical Journal*, 977(2):227, December 2024.

2022 **H. Knierim**, S. Shibata, and R. Helled. Constraining the origin of giant exoplanets via elemental abundance measurements. *Astronomy and Astrophysics*, 665:L5, September 2022.

2022 **H. Knierim**, K. Batygin, and B. Bitsch. Shallowness of circulation in hot Jupiters. Advancing the Ohmic dissipation model. *Astronomy and Astrophysics*, 658:L7, February 2022.

Non-First Author Publications

2025 R. Helled, including **H. Knierim**, et al. Giant Planet Evolution with MESA. *In press in Astronomy and Astrophysics*, page arXiv:2510.23678, October 2025.

2025 I. Lockley, including **H. Knierim**, et al. The TOI-1117 multiplanetary system: 3 sub-Neptunes, 1 in both the Neptunian Desert and Radius Valley. *Monthly Notices of the Royal Astronomical Society*, 541(2):919–938, August 2025.

2025 N. Grieves, including **H. Knierim**, et al. Discovery of a cold giant planet and mass measurement of a hot super-Earth in the multi-planetary system WASP-132. *Astronomy and Astrophysics*, 693:A144, January 2025.

2024 A. Psaridi, including **H. Knierim**, et al. Discovery of two warm mini-Neptunes with contrasting densities orbiting the young K3V star TOI-815. *Astronomy and Astrophysics*, 685:A5, May 2024.

2024 M. Cointepas, including **H. Knierim**, et al. TOI-663: A newly discovered multi-planet system with three transiting mini-Neptunes orbiting an early M star. *Astronomy and Astrophysics*, 685:A19, May 2024.

2023 A. Osborn, including **H. Knierim**, et al. TOI-332 b: a super dense Neptune found deep within the Neptunian desert. *Monthly Notices of the Royal Astronomical Society*, 526(1):548–566, November 2023.

2023 D. Armstrong, including **H. Knierim**, et al. Discovery and characterization of two Neptune-mass planets orbiting HD 212729 with TESS. *Monthly Notices of the Royal Astronomical Society*, 524(4):5804–5816, October 2023.

Additional Qualifications and Activities

Michael Haukohl Foundation scholarship in rhetoric and debate; participated in Lübeck high schools' inaugural debating competition

Representative of Kyoto University at "The Negotiation Challenge" 2019

Model United Nations of Lübeck participant (4x)

Volunteer German teacher and mentor for refugees in Germany

Trained mentor for high school students, specifically from low-income backgrounds