

# Curriculum Vitae of Patrick Barth

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## Contact

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## Work experience

Since 2019                      **Postgraduate Researcher**  
                                 University of St Andrews, School for Physics and Astronomy & School for Earth  
                                 and Environmental Sciences, UK  
                                 St Andrews Centre for Exoplanet Science  
Feb. - July 2017                **Student Research Assistant**  
                                 Max Planck Institute for Astronomy, Heidelberg, Germany

## Education

Since 2019                      **PhD in Astronomy**  
                                 University of St Andrews, School for Physics and Astronomy & School for Earth  
                                 and Environmental Sciences, UK  
                                 St Andrews Centre for Exoplanet Science  
                                 Supervisor: Dr. Christiane Helling & Dr. Eva Stüeken  
2017 - 2018                      **International Student**  
                                 University of Washington, Seattle, United States of America  
2017 - 2019                      **Master of Science in Physics** (2-year program)  
                                 Final Grade: 1.1 (very good), University of Heidelberg, Department of Physics and  
                                 Astronomy, Germany  
2013 - 2017                      **Bachelor of Science in Physics**  
                                 Final grade: 1.7 (good), University of Heidelberg, Department of Physics and As-  
                                 tronomy, Germany  
2013                                **Abitur**  
                                 Final grade: 1.1 (very good), Karl-Friedrich-Gymnasium Mannheim, Germany

## Awards

2021	<b>Student Presentation Award</b> NoRCEL Meeting, 29-31 March 2021, St Andrews, UK (online)
2019 - 2023	<b>St Leonard's Interdisciplinary Doctoral Scholarship</b> University of St Andrews, UK
2017 - 2018	<b>Baden-Württemberg-Stipendium</b> Scholarship for distinguished students studying abroad
2013	High School Graduation Award of the German Physical Society (DPG)

## Teaching

Spring 2021	<b>Guest lecture for “Chemistry of the Solar System” lecture</b> held by Dr. Paul Savage and Dr. Christiane Helling, School of Earth and Environmental Sciences, University of St Andrews, UK
Spring 2021	<b>Tutor for “Computational Astrophysics” lecture</b> held by Dr. Peter Voitke, Dr. Christiane Helling, and Dr. Martin Dominik, School of Physics and Astronomy, University of St Andrews, UK
Autumn 2020	<b>Demonstrator for “Astronomy and Astrophysics 1” lab</b> held by Dr. Alexander Scholz, School of Physics and Astronomy, University of St Andrews, UK
Spring 2020	<b>Tutor for “Computational Astrophysics” lecture</b> held by Dr. Peter Voitke, Dr. Christiane Helling, and Dr. Martin Dominik, School of Physics and Astronomy, University of St Andrews, UK

## Publications

- Raymond, S. N., et al., incl. **Barth, P.**, 2021, *An upper limit on late accretion and water delivery in the TRAPPIST-1 exoplanet system*, Nature Astronomy, in press.
- **Barth, P.** et al., 2021, *Magma Ocean Evolution of the TRAPPIST-1 planets*, Astrobiology, in press. [arXiv](#).
- **Barth, P.** et al., 2021, *MOVES IV. Modelling the influence of stellar XUV-flux, cosmic rays, and stellar energetic particles on the atmospheric composition of the hot Jupiter HD 189733b*, MNRAS, 502, 6201. [DOI](#), [arXiv](#).
- Voitke, P., et al., incl. **Barth, P.**, 2021, *Coexistence of CH<sub>4</sub>, CO<sub>2</sub> and H<sub>2</sub>O in exoplanet atmospheres*, A&A 646, A43. [DOI](#), [arXiv](#).
- Barnes, R., et al., incl. **Barth, P.**, 2020, *VPlanet: The Virtual Planet Simulator*, PASP, 132, 024502. [DOI](#), [arXiv](#).
- Carone, L., Baeyens, R., Mollière, P., **Barth, P.**, et al., 2020, *Equatorial retrograde flow in WASP-43b elicited by deep wind jets?*, MNRAS, 496, 3582. [DOI](#), [arXiv](#).

## Talks

- 9 July 2021 **“Tracking the role of lightning-produced nitrate for early life with nitrogen isotopes in spark discharge experiments”**  
Goldschmidt 2021, Lyon, France (online)
- 28 May 2021 **“Magma Ocean Evolution of the TRAPPIST-1 planets”**  
NASA ‘Quantifying Habitability’ Science Working Group (online)
- 29 April 2021 **“Modelling the influence of high-energy radiation on the atmospheric composition of the hot Jupiter HD 189733b”**  
vEGU21 (online)
- 31 March 2021 **“Understanding the role of lightning in the formation of organic molecules on early Earth”**  
NoRCEL Meeting, St Andrews, UK (online)
- 26 November 2020 **“Modelling the influence of high-energy radiation on the atmospheric composition of HD 189733b”**  
CHAMELEON kick-off meeting, University of St Andrews, UK (online)
- 17 November 2020 **“What’s the role of lightning in the origin of life”**  
Out Thinkers (LGBT+ STEM Week 2020), University of St Andrews, UK (online)
- 21 October 2020 **“Modelling the influence of high-energy radiation on the atmospheric composition of HD 189733b”**  
Scottish Exoplanet and Brown Dwarf Meeting, University of Edinburgh, UK (online)
- 24 July 2020 **“MOVES IV: Modelling the influence of high-energy radiation on the atmospheric composition of HD 189733b”**  
NOVO Nordisk Meeting, Niels Bohr Institute, University of Copenhagen, Denmark (online)
- 23 June 2020 **“MOVES IV: Modelling the influence of high-energy radiation on the atmospheric composition of HD 189733b”**  
Summer Meeting, St Andrews Centre for Exoplanet Science, UK (online)
- 18 Dec 2019 **“Magma Ocean Model for Terrestrial (Exo)Planets”**  
PSF-Coffee, MPIA, Heidelberg, Germany
- 10 Oct 2019 **“Magma Ocean Model for Terrestrial (Exo)Planets”**  
VPL Meeting, University of Washington, Seattle, US
- 23 Aug 2019 **“Magma Ocean Model for Terrestrial (Exo)Planets”**  
Summer Meeting, St Andrews Centre for Exoplanet Science, UK
- 27 March 2019 **“Coupled Atmosphere-Interior Model for Terrestrial Planets - Application to Early Earth”**  
General Meeting SPP 1833 Habitable Earth, DFG, Cologne, Germany
- 30 April 2017 **“Zirkulation mit Wolkenbildung in planetaren Atmosphären”**  
(G)Astro-Seminar, jDPG, Bad Kreuznach, Germany
- 11 Jan. 2017 **“Large-Scale Circulation with Cloud Formation in Planetary Atmospheres”**  
PSF-Coffee, MPIA, Heidelberg, Germany

## Posters

Sept. 2020	<b>“X-rays, UV, and co: detrimental or beneficial to the origin of life?”</b> <a href="#">Royal Astronomical Society Early Career Poster Exhibition 2020</a>
26 Aug. 2020	<b>“X-rays, UV, and co: detrimental or beneficial to the origin of life?”</b> The STEM Village Virtual Symposium 2020
27-31 July 2020	<b>“MOVES IV: Modelling the influence of high-energy radiation on the atmospheric composition of HD 189733 b”</b> Exoplanet 3, Heidelberg, Germany (online)
6-8 April 2020	<b>“MOVES IV: Modelling the influence of stellar XUV-flux and cosmic rays on the atmospheric composition of HD 189733 b”</b> UKEXOM, Birmingham, UK (cancelled due to COVID-19)
9-13 March 2020	<b>“MOVES IV: Modelling the influence of stellar XUV-flux and cosmic rays on the atmospheric composition of HD 189733 b”</b> Cloud Academy II, Les Houches, France (cancelled due to COVID-19)
15-20 Sept. 2019	<b>“Desiccation of the TRAPPIST-1 Planets During Their Magma Ocean Phase”</b> EPSC-DPS Joint Meeting, Geneva, Switzerland (presented by Ludmila Carone)
24-28 June 2019	<b>“Desiccation of the TRAPPIST-1 Planets During Their Magma Ocean Phase”</b> Astrobiology Science Conference, Seattle, WA, USA (presented by Rory Barnes)
24-28 June 2019	<b>“Desiccation of the TRAPPIST-1 Planets During Their Magma Ocean Phase”</b> “Star-planet interaction” workshop, Ringberg, Germany (presented by Ludmila Carone)

## Outreach

Since 2019	<b>Mobile Planetarium</b> University of St Andrews, School for Physics and Astronomy
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## Programming Skills

- Intermediate: Python, C
- Basics: Fortran

## Languages

- Native language: German
- Fluent: English
- Basics: Spanish, French

## Volunteer Experience

Since 2020	<b>University of St Andrews Liberal Democrats</b> Treasurer
Since 2019	<b>SaintsLGBT+, University of St Andrews Student Association</b> Postgraduate Officer
2019 - 2021	<b>Hector-Seminar Alumni Association</b> Vice President
2015 - 2019	Secretary
2013 - 2019	<b>Election Worker</b> in Mannheim, Germany