

# Curriculum Vitae of Patrick Barth

---

Last updated: December 3, 2021

## Contact

Address                      University of St Andrews  
School of Physics and Astronomy  
North Haugh  
KY16 9SS St Andrews  
UK  
Email                        pb94@st-andrews.ac.uk  
Website                     pbfeu.github.io

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

## Students

|            |  |
|------------|--|
| since 2020 | <b>Lukas Rossmanith</b><br>Undergraduate research assistant, spark experiments and analysis, co-supervision with Dr. Eva Stüeken |
|------------|--|

## Teaching & Organisation

|             |  |
|-------------|--|
| Since 2019  | <b>Host and organizer of the <a href="#">Journal Club</a></b><br>St Andrews Centre for Exoplanet Science   |
| Autumn 2021 | <b>Demonstrator for “Astronomy and Astrophysics 1” lab</b><br>held by Dr. Alexander Scholz, School of Physics and Astronomy, University of St Andrews, UK  |
| Spring 2021 | <b>Guest lecture for “Chemistry of the Solar System” lecture</b><br>held by Dr. Paul Savage and Prof. Christiane Helling, School of Earth and Environmental Sciences, University of St Andrews, UK |
| Spring 2021 | <b>Tutor for “Computational Astrophysics” lecture</b><br>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><br>held by Dr. Alexander Scholz, School of Physics and Astronomy, University of St Andrews, UK  |
| Spring 2020 | <b>Tutor for “Computational Astrophysics” lecture</b><br>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 2021. [DOI](#), [arXiv](#).
- **Barth, P.** et al., 2021, *Magma Ocean Evolution of the TRAPPIST-1 planets*, Astrobiology 21, 11. [DOI](#), [arXiv](#), [GitHub](#).
- **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](#).

- Woitke, 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](#), [GitHub](#).
- 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

|               |   |
|---------------|---|
| 15 Sept. 2021 | <p><b>“Tracking the role of lightning-produced nitrate for early life with nitrogen isotopes in spark discharge experiments”</b></p> <p><a href="#">AbGradCon 2021</a>, ELSI, Japan (online)</p>                      |
| 9 July 2021   | <p><b>“Tracking the role of lightning-produced nitrate for early life with nitrogen isotopes in spark discharge experiments”</b></p> <p><a href="#">Goldschmidt 2021</a>, Lyon, France (online)</p>                   |
| 28 May 2021   | <p><b>“Magma Ocean Evolution of the TRAPPIST-1 planets”</b></p> <p>NASA ‘Quantifying Habitability’ Science Working Group (online)</p>   |
| 29 April 2021 | <p><b>“Modelling the influence of high-energy radiation on the atmospheric composition of the hot Jupiter HD 189733b”</b></p> <p><a href="#">vEGU21</a> (online)</p>  |
| 31 March 2021 | <p><b>“Understanding the role of lightning in the formation of organic molecules on early Earth”</b></p> <p><a href="#">NoRCEL</a> Meeting, St Andrews, UK (online)</p>   |
| 26 Nov. 2020  | <p><b>“Modelling the influence of high-energy radiation on the atmospheric composition of HD 189733b”</b></p> <p>CHAMELEON kick-off meeting, University of St Andrews, UK (online)</p>                                |
| 17 Nov. 2020  | <p><b>“What’s the role of lightning in the origin of life”</b></p> <p>Out Thinkers (LGBT+ STEM Week 2020), University of St Andrews, UK (online)</p>  |
| 21 Oct. 2020  | <p><b>“Modelling the influence of high-energy radiation on the atmospheric composition of HD 189733b”</b></p> <p>Scottish Exoplanet and Brown Dwarf Meeting, University of Edinburgh, UK (online)</p>                 |
| 24 July 2020  | <p><b>“MOVES IV: Modelling the influence of high-energy radiation on the atmospheric composition of HD 189733b”</b></p> <p>NOVO Nordisk Meeting, Niels Bohr Institute, University of Copenhagen, Denmark (online)</p> |
| 23 June 2020  | <p><b>“MOVES IV: Modelling the influence of high-energy radiation on the atmospheric composition of HD 189733b”</b></p> <p>Summer Meeting, St Andrews Centre for Exoplanet Science, UK (online)</p>                   |
| 18 Dec. 2019  | <p><b>“Magma Ocean Model for Terrestrial (Exo)Planets”</b></p> <p>PSF-Coffee, MPIA, Heidelberg, Germany</p>   |

|               |  |
|---------------|--|
| 10 Oct. 2019  | <b>“Magma Ocean Model for Terrestrial (Exo)Planets”</b><br>VPL Meeting, University of Washington, Seattle, US  |
| 23 Aug. 2019  | <b>“Magma Ocean Model for Terrestrial (Exo)Planets”</b><br>Summer Meeting, St Andrews Centre for Exoplanet Science, UK   |
| 27 March 2019 | <b>“Coupled Atmosphere-Interior Model for Terrestrial Planets - Application to Early Earth”</b><br>General Meeting SPP 1833 Habitable Earth, DFG, Cologne, Germany |
| 30 April 2017 | <b>“Zirkulation mit Wolkenbildung in planetaren Atmosphären”</b><br>(G)Astro-Seminar, jDPG, Bad Kreuznach, Germany   |
| 11 Jan. 2017  | <b>“Large-Scale Circulation with Cloud Formation in Planetary Atmospheres”</b><br>PSF-Coffee, MPIA, Heidelberg, Germany  |

## Posters

|                  |   |
|------------------|---|
| Sept. 2020       | <b>“X-rays, UV, and co: detrimental or beneficial to the origin of life?”</b><br><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><br>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><br><a href="#">Exoplanet 3</a> , 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><br>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><br>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><br>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><br>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><br>“Star-planet interaction” workshop, Ringberg, Germany (presented by Ludmila Carone)                              |

## Outreach

|            |  |
|------------|--|
| Since 2020 | <a href="#">STEM Ambassador, STEM Learning, UK</a>   |
| Since 2019 | <a href="#">Mobile Planetarium</a><br>University of St Andrews, School for Physics and Astronomy |

## Programming Skills

- Intermediate: Python, C
- Basics: Fortran

## Languages

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

## Volunteer Experience

|             |  |
|-------------|--|
|             | <b>University of St Andrews Liberal Democrats</b>                                |
| Since 2020  | Treasurer  |
|             | <b>St Andrews Whisky Society</b>   |
| Since 2021  | Secretary  |
| 2019 - 2021 | Ordinary Committee member  |
|             | <a href="#"><b>SaintsLGBT+, University of St Andrews Student Association</b></a> |
| 2019 - 2021 | Postgraduate Officer   |
|             | <a href="#"><b>Hector-Seminar Alumni Association, Germany</b></a>                |
| 2019 - 2021 | Vice President   |
| 2015 - 2019 | Secretary  |
| 2013 - 2019 | <b>Election Worker</b> in Mannheim, Germany                                      |