

## CONTACT INFORMATION

---

<i>Institute</i>	Institute for Theoretical Particle Physics and Cosmology (TTK), RWTH Aachen
<i>Address</i>	Otto-Blumenthal-Straße 12, 52074 Aachen
<i>Office</i>	Modulbau Physik, 112
<i>Phone</i>	+49 (0)241 8026587
<i>Email</i>	brieden@physik.rwth-aachen.de
<i>Website</i>	<a href="https://SamuelBrieden.github.io/">https://SamuelBrieden.github.io/</a>
<i>ORCID</i>	<a href="https://orcid.org/0000-0003-3896-9215">https://orcid.org/0000-0003-3896-9215</a>

## RESEARCH INTERESTS

---

**Theoretical Cosmology:** Non-linear structure formation, web-halo model, dark energy and dark matter, modified gravity, primordial non-Gaussianity, neutrino physics. **Observational Cosmology:** Large-scale structure, galaxy surveys (DESI, Euclid), blinding methods, model-agnostic analysis.

## EMPLOYMENT HISTORY

---

**Postdoctoral Researcher** **mid September 2025 - present**  
*RWTH Aachen, TTK*

- Line Manager: Prof. Dr. Julien Lesgourgues

**Postdoctoral Research Associate** **October 2022 - mid September 2025**  
*University of Edinburgh, Institute for Astronomy*

- Line Manager: Prof. Dr. Florian Beutler

## EDUCATION

---

**Ph.D. in Physics** **October 2018 - September 2022**  
*University of Barcelona, Institute of Cosmos Sciences*

- Thesis: From the Precision Era towards the Accuracy Era of Cosmology with DESI  
(excellent *Summa Cum Laude*)

- Advisors: Dr. Héctor Gil-Marín and Prof. Dr. Licia Verde

**MSc. Physics** **October 2016 - September 2018**  
*RWTH Aachen, TTK*

- Thesis: Accurate Non-Linear Corrections Including Baryonic Feedback in Boltzmann Codes

- Advisors: Dr. Maria Archidiacono and Prof. Dr. Julien Lesgourgues

**Exchange Student** **October 2016 - March 2017**  
*Autonomous University of Madrid, Institute of theoretical physics*

- Erasmus scholarship, participation in master courses of cosmology, astronomy and particle physics.

**BSc. Physics** **October 2012 - September 2016**  
*RWTH Aachen, TTK*

- Thesis: Dark Matter Constraints from AMS-02 Antiprotons

- Advisors: Dr. Alessandro Cuoco and Prof. Dr. Julien Lesgourgues

## AWARDS AND GRANTS

---

<b>Lancelot M. Berkeley–New York Community Trust Prize</b> <i>Rewarded to DESI collaboration for creating the largest 3D map of the universe. I was a key contributor to that effort (see below).</i>	<b>August 2025</b>
<b>Shortlisted for Royal Astronomical Society (RAS) Research Fellowship</b> <i>Among the best 6 candidates invited to interview.</i>	<b>March 2025</b>
<b>Spanish Astronomy Society Thesis Prize</b> <i>For the best Doctoral Thesis of the year in Astronomy and Astrophysics in Spain.</i>	<b>July 2023</b>
<b>La Caixa doctoral fellowship</b> <i>Granted in context of the la Caixa Junior Leader fellowship by Héctor Gil Marín.</i>	<b>2018</b>
<b>Erasmus+ grant</b> <i>Financial support for admission to Master course and stay abroad in Madrid.</i>	<b>2016</b>
<b>Physics Award (1<sup>st</sup> prize) and Dr. Hans Riegel Award (2<sup>nd</sup> prize)</b> <i>For my high school paper "Behaviour of a Gyro". Competition among pupils within the region Bergisches Land and the state of North Rhine Westphalia, Germany.</i>	<b>2011</b>

## COLLABORATION MEMBERSHIP AND LEADERSHIP POSITIONS

---

<b>Dark Energy Spectroscopic Instrument (DESI)</b> - Co-chair of DESI-II low redshift, high density Topical Group (November 2024 - present). - Co-chair of DESI Education and Public Outreach (EPO) Committee (October 2023 - September 2024).	<b>October 2018 - present</b>
<b>Euclid Consortium</b>	<b>June 2023 - present</b>
<b>Satellite for Infrared Multi-Object Spectroscopy (SIRMOS)</b>	<b>June 2023 - present</b>

## TEACHING AND MENTORSHIP

---

Extensive experience in group and one-on-one teaching:

- Tutor for Classical Mechanics physics course at RWTH Aachen including weekly 1.5-hour tutorial sessions for 30 undergraduate students and marking (October 2025 - present).
- Supervising Alexander Tipp, Master student at RWTH Aachen with project "Non-linear structure formatio with the Web-Halo-Model", (September 2025 - present).
- Co-supervised PhD student Jade Piat at University of Edinburgh on "Relativistic effects with DESI" (September 2023 - September 2025).
- Supervised Marnix Looijmans, graduate student at University of Edinburgh, Mphys project "Testing the halo model in 1D and 2D", (September 2023 - May 2024).
- Supervised Sophia Schubert, undergraduate student at University of Edinburgh, summer project "The universe in a soup plate", (June 2023 - August 2023).

## OUTREACH ACTIVITIES

---

- As member (2021-2024) and Co-chair (2023-2024) of the DESI EPO Committee I participated on a variety of outreach projects. Most notably, I handled the DESI social media accounts (2021-2024), coordinated the German translation of DESI planetarium film “5000 Eyes” (Feb. 2023), wrote a Blog article about DESI ambassador “BaoBan” (May 2023), and communicated the DESI DR1 results on our social media channels and blog (April-November 2024).
- Engaging in local outreach projects such as mobile planetarium shows in primary schools, Open Days and the “Astronomy for All” Outreach talk at Royal Observatory Edinburgh on “The universe in a soup bowl” (March 2024).
- Participation in artistic project “The ends of everythings” in collaboration with the ICC and artist Andy Gracie (2021-2022).

## SERVICE

---

- Referee for *Monthly Notices of the Royal Astronomical Society* (MNRAS), the *Journal of Cosmology and Astroparticle Physics* (JCAP), and for the *Astrophysical Journal* (ApJ) of the American Astronomical Society (AAS).
- Regular remote assistant observing for DESI.
- Co-organized “Theoretical Modeling of Large-Scale Structure of the Universe” workshop at The Higgs Centre for Theoretical Physics, Edinburgh, UK (June 2024).

## SKILLS

---

*Languages*      German (native); English, Spanish (fluent); Catalan, French, Portuguese (basic).

*Programming*    PYTHON, C, C++, FORTRAN, MATLAB, MATHEMATICA

## INVITED TALKS AND CONFERENCE CONTRIBUTIONS

---

1. Talk at Munich Large-Scale Structure Days - Garching, Max Planck Institute for Extraterrestrial Physics - “*Web-Halo Model of Large Scale Structure*” - October 2025.
2. Invited Speaker at ASpekt 2025 - Erkrath, Officecenter - “*Blind spots of the Cosmos: Drawing the Map from Einstein to Dark Energy with DESI Spectra*” - October 2025.
3. Invited Speaker at CosmoVerse Workshop - Naples, Scuola Superiore Meridionale - “*Recent developments in Clustering systematics*” - May 2025.
4. Invited Speaker at Cosmology on the steep rise conference - Sexten Center for Astrophysics - “*DESI Galaxy clustering results (BAO and beyond)*” - February 2025.
5. Invited seminar talk - Universität Zürich - “*From the precision era towards the accuracy era of cosmology with DESI*” - October 2024.
6. Invited talk at SEA 2024 meeting in Granada - “*From the Precision Era, towards the Accuracy Era of Cosmology with DESI. Premio tesis SEA 2023*” - July 2024.
7. Invited talk at “Neutrinos from Home” conference - “*DESI BAO 2024 and Neutrinos: Reaching the limits*” - April 2024.
8. Talk at SUPA Cormack Astronomy Meeting 2023 - Glasgow - “*From the precision era towards the accuracy era of cosmology with DESI*” - December 2023.

9. Invited talk at AliCPT Forum - "*A tale of two (or more)  $h$ 's*" - October 2023.
10. Invited talk at CosmoPalooza virtual webinar - "*DESI: Cosmology beyond BAO on large scales*" - October 2023.
11. Invited talk at EAS 2023 conference within Session S10c - Kraków - "*Cosmology with the Dark Energy Spectroscopic Instrument (DESI)*" - July 2023.
12. Invited seminar talk - University College London - "*A tale of two (or more)  $h$ 's*" - May 2023.
13. Invited seminar talk - Institut d'Astrophysique de Paris, Sorbonne Université - "*A tale of two (or more)  $h$ 's*" - March 2023.
14. Talk at DEX-XIX Workshop - University of Edinburgh - "*A tale of two (or more)  $h$ 's*" - January 2023.
15. Talk at Essential Cosmology for the Next Generation conference - Cancún (Mexico) - "*From the Precision Era towards the Accuracy Era of Cosmology with DESI*" - December 2022.
16. Talk at "Cosmology from Home" conference- "*Model-agnostic interpretation of 10 billion years of cosmic evolution traced by BOSS and eBOSS data*" - July 2022.
17. Talk at IberiCOS conference - Universidad Autónoma de Barcelona - "*Bridging the divide between theoretical and observational cosmology: ShapeFit results from the BOSS+eBOSS legacy.*" - May 2022.
18. Invited talk (virtual) - University of Edinburgh, Royal Observatory Edinburgh - "*ShapeFit. Model-independent versus model-dependent interpretation of galaxy power spectra: Bridging the divide.*" - November 2021.
19. Invited talk (virtual) - Universidad Nacional Autónoma de México (UNAM), "*ShapeFit: Bridging the divide between model-independent vs. model-dependent interpretation of galaxy power spectra*" - June 2021.
20. Invited talk (virtual) - University of Milan, "*HMcode-2020: Improved modelling of non-linear cosmological power spectra with baryonic feedback.*" - November 2020.
21. Invited talk (virtual) - Euclid Collaboration meeting - "*Blinding redshift surveys at the catalog level*" - February 2020
22. Invited lecture (virtual) - Universidad Nacional Autónoma de México (UNAM) - "*Cosmology with CLASS.*" - December 2019.