



Dr. Ann-Kathrin Perrevoort

EXPERIMENTAL PARTICLE PHYSICIST · CHALLENGING THE SYMMETRIES OF THE LEPTON SECTOR

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Summary

Experimental particle physicist who strives to unveil physics beyond the Standard Model by precision tests in the lepton sector. Working experience in small- and large-scale international collaborations. Profound expertise in data analysis and physics modelling. Strong background in data acquisition and firmware development. Loves to discuss particle physics with experimentalists, theorists, students and everyone who is interested.

Professional Experience & Academic Education

Tenure-Track Assistant Professor in Experimental Particle Physics

Groningen (NL)

UNIVERSITY OF GRONINGEN

since Jan. 2024

- Installation of a new LHCb working group at the Van Swinderen Institute for Particle Physics and Gravity
- Tests of lepton-flavour universality and searches for lepton-flavour violation in b hadron decays
- Research and development for the second upgrade of the LHCb vertex locator pixel detector
- Teaching of courses in physics bachelor and Honours College programme and supervision of thesis projects

Postdoctoral Researcher in the Mu3e Experiment

Karlsruhe (DE)

KARLSRUHE INSTITUTE OF TECHNOLOGY – FELLOW IN THE YOUNG INVESTIGATOR PREPARATION PROGRAM

Jan. 2022 - Dec. 2023

- Installation of a Mu3e working group at the Institute of Experimental Particle Physics
- Implementation of the data readout for $\mu \rightarrow eX$ searches and preparation of the analysis of $\mu \rightarrow eX$ and $\mu \rightarrow eee$ searches
- Funded by the Excellence Strategy of the German Federal and State Governments
- Mentor: Prof. Ulrich Husemann (now at DESY Hamburg, DE)

Postdoctoral Researcher in the ATLAS Experiment

Nijmegen (NL) / CERN, Geneva (CH)

RADBOUD UNIVERSITY NIJMEGEN – FULL-TIME BASED AT CERN

Sep. 2021 - Dec. 2021

- Substitute for Assistant Professor Dr. Mengqing Wu during maternity leave
- Substitute coordinator of the luminosity, DAQ and controls sub-group in the High Granularity Timing Detector (HGTD) upgrade project
- Measurement of R_{K^*} in the context of lepton-flavour universality tests
- Search for Heavy Majorana Neutrinos produced in Vector-Boson Scattering
- Continuously based at CERN
- Supervisor: Assistant Prof. Dr. Mengqing Wu

Postdoctoral Researcher in the ATLAS Experiment

Amsterdam (NL) / CERN, Geneva (CH)

NIKHEF NATIONAL INSTITUTE FOR SUBATOMIC PHYSICS – BASED AT CERN SINCE FEB. 2019

June 2018 - Aug. 2021

- Search for the lepton-flavour violating decays $Z \rightarrow \tau e$ and $Z \rightarrow \tau \mu$
- Measurement of R_{K^*} in the context of lepton-flavour universality tests
- Firmware implementation of inter-board synchronisation in the FastTracker data formatter
- Continuously based at CERN from Feb. 2019
- Supervisor: Prof. Olya Igonkina (t), Prof. Wouter Verkerke, Prof. Nicolo de Groot

PhD in Physics

Heidelberg (DE)

RUPRECHT-KARLS-UNIVERSITÄT HEIDELBERG

April 2014 - May 2018

- Thesis: Sensitivity Studies to New Physics in the Mu3e Experiment and Development of Firmware for the Front-End of the Mu3e Pixel Detector
- Event generators for new physics processes, sensitivity studies, front-end firmware development, beam tests of pixel sensors
- Supervisor: Prof. Niklaus Berger

Visiting Researcher

Wakō-shi (JP)

RIKEN NISHINA CENTER FOR ACCELERATOR-BASED SCIENCE

Feb. 2013 - Jan. 2014

- Participant in the joint program of RIKEN and the Studienstiftung des deutschen Volkes e.V.
- Development of electronics for clock synchronisation at the TPC of the SAMURAI Experiment (nuclear physics)
- PCB design, firmware implementation, microcontroller programming, design of the graphical user interface

Undergraduate Education

Heidelberg (DE)

RUPRECHT-KARLS-UNIVERSITÄT HEIDELBERG

2007 - 2012

- 2010-2012 **Master of Science in Physics**
- Thesis: Characterisation of High Voltage Monolithic Active Pixel Sensors for the Mu3e Experiment
 - Focus on particle and medical physics
 - Supervisor: Prof. André Schöning
- 2007-2010 **Bachelor of Science in Physics**
- Thesis: Determination of the Amplification at GEM Foils in Dependence of the Pitch for Boron Coated Drift Electrodes
 - Supervisor: Apl. Prof. Ulrich Schmidt

Fellowships and Awards

- 2025 **Breakthrough Prize in Fundamental Physics** as (former) member of the LHCb (ATLAS) collaboration Los Angeles (US)
- 2022-2023 **Fellowship** Young Investigator Group Preparation Program YIGPrepPro at KIT Karlsruhe (DE)
funded by the Excellence Strategy of the German Federal and State Governments (*The Research University in the Helmholtz Association: Living the Change*), granted in a competitive process with a success rate of ca. 10%, covering the own position, 100k€ research budget, mentoring and soft-skill seminars
- 2018 **Best Poster Award** Tau 2018 Amsterdam (NL)
- 2017 **Best Presentation Award** A Matter of Flavor Mainz (DE)
- 2015 **Oreste Piccioni Diploma** International School on Subnuclear Physics (ISSP) Erice (IT)
- 2014-2018 **Research Training Group** Particle Physics beyond the Standard Model Heidelberg (DE)
joint program for PhD students in experimental and theoretical particle physics and cosmology, funded by the German Research Foundation (GRK 1940, project number 229556894)
- 2014-2018 **Graduate School** Heidelberg Graduate School of Fundamental Physics, Heidelberg (DE)
funded by the Excellence Strategy of the German Federal and State Governments (GSC 129, project number 24838972)
- 2013-2014 **Scholarship for a research stay at RIKEN** Germany, Japan
joint program of the Studienstiftung des deutschen Volkes e.V. (German Academic Scholarship Foundation) and RIKEN
- 2007-2014 **Scholarship during BSc and MSc studies** Studienstiftung des deutschen Volkes e.V. Germany
(German Academic Scholarship Foundation), awarded to <1% of German students

Coordination Roles and Organisational Activities

LHCb COLLABORATION AT CERN

- 2025 **Review Committee Member** of the full Run 2 Measurement of η/η' mixing angles in $B_{d,s} \rightarrow J/\psi\eta^{(\prime)}$ in LHCb

ATLAS COLLABORATION AT CERN

- 2021 **Substitute-Coordinator** of the Luminosity, DAQ and Controls sub-group of the ATLAS HGTD upgrade project
- 2021 **Editorial Board Member** of the full Run 2 $H \rightarrow \ell\tau$ Search in ATLAS
- 2019-2021 **Analysis Contact and Contact Editor** of the full Run 2 $Z \rightarrow \ell\tau$ Search in ATLAS
- 2019-2021 **Analysis Contact** for the ATLAS R_{K^*} Measurement in Run 2
- 2019-2021 **Theory Contact** for Lepton Flavour Violation in ATLAS
- 2018-2019 **Main Firmware Developer** for the Data Formatter Board at the ATLAS FastTracker Upgrade

KARLSRUHE INSTITUTE OF TECHNOLOGY (KIT)

- 2023 **Mid-term evaluation of KIT as University of Excellence:** KIT is funded by the Excellence Strategy of the German Federal and State Governments as University of Excellence which covers among others the Young Investigator Group Preparation Program. As fellow of this program, I have contributed with my personal experience to the mid-term evaluation in view of the goal *Providing Reliable Academic Careers*.

RADBOUD UNIVERSITY NIJMEGEN

- 2021 **Substitute for Assistant Prof. Dr. M. Wu during maternity leave:**
Co-supervision of a MSc and a PhD student
Coordination of the Dutch contributions to the ATLAS HGTD upgrade and of an HGTD sub-group in ATLAS

FUNDING AGENCIES

- 2025 **Assessment committee member of NWO Open Competition Science Domain M grants** (Dutch research council) assessing grant proposals (400k€ to 800k€) in the fields of physics, chemistry and life sciences

LOCAL AND INTERNATIONAL WORKSHOPS

- 2024 Member of the **Local Organising Committee** of the 10 years VSI anniversary symposium in Groningen (NL)
- 2022 Member of the **Local Organising Committee** of the DISCRETE 2022 Workshop in Baden-Baden (DE)
- 2018 **Volunteer** at the Tau 2018 Workshop in Amsterdam (NL)

Teaching and Outreach

LECTURES

- 2024 **Lectures on method of science and quantum and particle physics** for non-science BSc students of the Honours College Broadening Module, University of Groningen
- 2025 Invited **lecture on experimental lepton physics** at the Herbstschule of High Energy Physics for PhD students, Bad Honnef (DE)
- 2025 **Lecture on particle physics** as part of the particle physics minor for 3rd year BSc students, University of Groningen
- 2024 **Lecture on subatomic physics** as elective for 3rd year BSc students, University of Groningen
- 2022 Invited **lecture on lepton flavour violation** at a retreat for PhD students of a Research Training Group from Heidelberg University
- 2017 Series of **lectures on lepton flavour violating muon decays** targeted at fellow PhD students of the Research Training Group at Heidelberg University

SUPERVISION

- 2025-2026 **Three MSc students**, one on firmware development for the data acquisition in the second VELO upgrade in the LHCb experiment, one on sensitivity studies for an LFV b hadron decay in LHCb, and one on measurements of Higgs properties with data of the ATLAS experiment (joined with LIP Lisbon, Portugal), University of Groningen
- 2024-2025 **Seven BSc students** in the LHCb experiment on data analysis of b hadron decays, University of Groningen
- 2025-2026 **Two extracurricular BSc students**, in the LHCb experiment, one on firmware development for the data acquisition in the second VELO upgrade, one on sensitivity studies for an LFV b hadron decay

CO-SUPERVISION

- 2021 **PhD student** in the ATLAS experiment on the search for heavy Majorana neutrinos and on data acquisition and controls at the HGTD upgrade, Radboud University (Dr. Wu)
- 2021 **MSc student** in the ATLAS experiment on testbeam data analysis and laboratory tests of ultra-fast silicon pixel sensors for the HGTD upgrade, Radboud University (Dr. Wu)
- 2018-2021 **PhD student** in the ATLAS experiment on the analysis of $Z \rightarrow \tau e$ and $Z \rightarrow \tau \mu$, Radboud University (Prof. Igonkina, Prof. de Groot)
- 2016-2018 **Three MSc students** in the Mu3e experiment on track and vertex reconstruction of photon conversion events, Heidelberg University (Prof. Schöning)
- 2012 **BSc student** in the Mu3e experiment on characterisation of monolithic silicon pixel sensors, Heidelberg University (Prof. Schöning)

PHD COMMITTEES

- 2026 **Member of the defense committee** for three doctoral candidates at Groningen University
- 2024 **Member of the reading and defense committee** for a doctoral candidate at VU Amsterdam
- 2024 **Member of the defense committee** for a doctoral candidate at Radboud University

TEACHING ASSISTANT

- 2023 **Experimental and Theoretical Methods in Particle Physics:** advanced seminar for MSc students at KIT
- 2022 & 2023 **Particle Physics II (Beyond the Standard Model):** exercise group, journal club and advanced seminar for MSc students at KIT
- 2014 **Advanced Lab Courses:** experiments with scintillating detectors for BSc students at Heidelberg University, two terms

OUTREACH

- 2026 **International Day of Women and Girls in Science:** guest speaker and panellist at an event organized by Young Minds Groningen aimed at showcasing careers in science of female researchers
- 2025 **Noorderzon:** cultural and societal festival, demonstration of a cloud chamber as example of a particle detector in connection to a lecture about neutrino detection given by Daan van Eijk
- 2015, 2017, 2021 **International Masterclasses with the ATLAS experiment:** hands-on particle physics classes for high school students
- 2018 **Nikhef Open Days:** outreach event for the general public

Further Training

UNIVERSITY TEACHING QUALIFICATION

Groningen

Pedagogic competence for teachers in academic education focussing on course design, teaching and supervision of students, assessment and evaluation

PHD SUPERVISION EXCELLENCE QUALIFICATION

Groningen

Leadership skills and competences needed to **support and supervise the development of PhD students** into independent researchers and academics

YIGPREP PRO COACHING

Karlsruhe

Soft skill seminars as preparation for leading an independent research group: scientific and grant writing, leadership skills, conflict management, self- and time management, digital tools for self-organisation, self-presentation

Collaborations

LHCb COLLABORATION

Hosted at **CERN** (CH), during Assistant Professorship at the University of Groningen (since 2024)

MU3E COLLABORATION

Hosted at **Paul Scherrer Institute** (CH), during MSc thesis (2011-2012), PhD (2014-2018), and fellowship at KIT (2022-2023)

ATLAS COLLABORATION

Hosted at **CERN** (CH), during PostDoc at Nikhef and Radboud University (2018-2021)

SAMURAI COLLABORATION

Hosted at **Radioactive Isotope Beam Factory at Nishina Center for Accelerator-Based Science at RIKEN** (JP), during research stay at RIKEN (2013-2014)

Selected Publications

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INSPIRE: A.K.PERREVOORT.2

SCOPUS: 55736702100

H-INDEX: 91 (FROM INSPIREHEP.NET)

- As a current member of the LHCb collaboration and former member of the ATLAS and Mu3e collaborations, I am author of over 80 LHCb papers, 280 ATLAS papers and 10 Mu3e papers.
- Papers in the ATLAS, LHCb and Mu3e collaborations are published with the entire collaboration author list in alphabetical order.
- My full list of publications can be found on iNSPIRE.

PEER-REVIEWED PUBLICATIONS

Search for Lepton-Flavor-Violation in Z-Boson Decays with τ -Leptons with the ATLAS Detector

ATLAS COLLABORATION: G. AAD, ... , A. PERREVOORT, ... , L. ZWALINSKI

2021

Phys. Rev. Lett. 127 (27) 271801 (2021), DOI: 10.1103/PhysRevLett.127.271801

Search for Charged-Lepton-Flavour Violation in Z-Boson Decays with the ATLAS Detector

ATLAS COLLABORATION: G. AAD, ... , A. PERREVOORT, ... , L. ZWALINSKI

2021

Nature Physics 17 (7) 819–825 (2021), DOI: 10.1038/s41567-021-01225-z

The ATLAS Fast Tracker System

ATLAS COLLABORATION: G. AAD, ... , A. PERREVOORT, ... , L. ZWALINSKI

2021

JINST 16 (2021) P07006, DOI: 10.1088/1748-0221/16/07/P07006

Technical Design of the Phase I Mu3e Experiment

MU3E COLLABORATION: K. ARNDT, ... , A. PERREVOORT, ... , T. ZHONG

2021

Nucl. Instrum. Meth. A 1014 (2021) 165679, DOI: 10.1016/j.nima.2021.165679

The Mu3e Data Acquisition

MU3E COLLABORATION: H. AUGUSTIN, ... , A. PERREVOORT, ... , T. ZHONG

2021

IEEE Trans. Nucl. Sci. 68 (2021) 8 1833–1840, DOI: 10.1109/TNS.2021.3084060

CONFERENCE PROCEEDINGS

Charged Lepton Flavour Violation: Overview of Current Experimental Limits and Future Plans

A. PERREVOORT FOR THE MU3E COLLABORATION

2024

PoS DISCRETE2022 (2024) 015 (DISCRETE 2022), DOI: 10.22323/1.431.0015

A Review of $\mu \rightarrow eee$, $\mu \rightarrow e\gamma$ and $\mu N \rightarrow eN$ Conversion

A. PERREVOORT FOR THE MU3E COLLABORATION

2023

PoS FPCP2023 (2023) 015 (FPCP 2023), DOI: 10.22323/1.445.0015

Searching for Charged Lepton Flavour Violation with Mu3e

A. PERREVOORT FOR THE MU3E COLLABORATION

2023

Phys. Sci. Forum 8 (2023) 30, DOI: 10.3390/psf2023008030

ATLAS Results with Beauty Mesons

A. PERREVOORT FOR THE ATLAS COLLABORATION 2022
SciPost Phys. Proc. 8 (2022) 099 (DIS 2021), DOI: 10.21468/SciPostPhysProc.8.099

Rare B-Decays: An Update from the ATLAS Experiment

A. PERREVOORT FOR THE ATLAS COLLABORATION 2021
PoS BEAUTY2020 (2021) 024 (BEAUTY 2020), DOI: 10.22323/1.391.0024

The Rare and Forbidden: Testing Physics Beyond the Standard Model with Mu3e

A. PERREVOORT FOR THE MU3E COLLABORATION 2019
SciPost Phys. Proc. 1 (2019) 052 (TAU 2018), DOI: 10.21468/SciPostPhysProc.1.052

Searching for Lepton Flavour Violation with the Mu3e Experiment

A. PERREVOORT FOR THE MU3E COLLABORATION 2017
PoS NuFact2017 (2017) 105 (NuFact 2017), DOI: 10.22323/1.295.0105

The MuPix Telescope: A Thin, High Rate Tracking Telescope

H. AUGUSTIN, ... , A. PERREVOORT, ... , D. WIEDNER 2017
JINST 12 (2017) 01 C01087 (TWEPP 2016), DOI: 10.1088/1748-0221/12/01/C01087

The MuPix System-on-Chip for the Mu3e Experiment

H. AUGUSTIN, ... , A. PERREVOORT, ... , D. WIEDNER 2016
Nucl. Instrum. Meth. A 845 (2017) 194–198 (VCI 2016), DOI: 10.1016/j.nima.2016.06.095

Status of the Mu3e Experiment at PSI

A. PERREVOORT FOR THE MU3E COLLABORATION 2016
EPJ Web Conf. 118 (2016) 01028 (FCCP 2015), DOI: 10.1051/epjconf/201611801028

High-Voltage Pixel Detectors in Commercial CMOS Technologies for ATLAS, CLIC and Mu3e Experiments

I. PERIĆ, ... , A. PERREVOORT, ... , A. MIUCCI 2013
Nucl. Instrum. Meth. A 731 (2013) 131–136 (PIXEL 2012), DOI: 10.1016/j.nima.2013.05.006

COMMUNITY REPORTS AND OTHER PUBLICATIONS

Shedding Light on X17: Community Report

D. AVES, ... , A. PERREVOORT, ... , X. ZHANG 2023
Corresponding author of the contribution *Prospects for Dark Photon Searches in the Mu3e Experiment*
Eur. Phys. J. C 83 (2023) 3, 230, DOI: 10.1140/epjc/s10052-023-11271-x

The Mu3e Experiment

G. HESKETH, S. HUGHES, A. PERREVOORT, N. ROMPOTIS 2022
Snowmass Summer Study 2021, arXiv:2204.00001 [hep-ex]

THESES

PhD Thesis

SENSITIVITY STUDIES ON NEW PHYSICS IN THE MU3E EXPERIMENT AND DEVELOPMENT OF FIRMWARE FOR THE FRONT-END OF THE MU3E
PIXEL DETECTOR 2018
Heidelberg University (2018), DOI: 10.11588/heidok.00024585

Groningen, 6th March 2026

Dr. Ann-Kathrin Perrevoort