



Philipp Alexander Kreer

Curriculum Vitae

Personal Information

- Nationality: German
- Place of Birth: Mainz, Rhineland-Palatinate, Germany
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Education

- Since October 2021 **Technische Universität München**, *PhD in Physics*, Applications of Quantum Field Theory in the Standard Model of particle physics.
- October 2019 – July 2021 **Johannes Gutenberg-Universität**, *Master of Science Physik*, Mainz, Grade: 1.0 equivalent to A grade.
- February 2020 – June 2020 **Research stay at University of Zürich**, *Project with Prof. Dr. Daniel Wyler and Prof. Dr. Gino Isidori on the Standard Model Effective Field Theory*.
- October 2016 – July 2019 **Johannes Gutenberg-Universität**, *Bachelor of Science Physik*, Mainz, Grade: 1.4 equivalent to A grade.
- September 2018 – January 2019 **Université de Toulouse III – Paul Sabatier**, *Semester abroad*.
Science de l'Univers et Technologie Spaciale
- July 2016 – September 2016 **Camino de Santiago**, Le Puy-en-Velay nach Santiago de Compostela.
- 2008–2016 **Bischöfliches Willigis-Gymnasium**, *Allgemeine Hochschulreife (higher education entrance qualification)*, Final grade: 1.3 equivalent to A grade, Mainz, major subjects: Physics, Math, and History.

Master's thesis

- Title Feynman Integrals for Black Holes: The Unequal Mass H-Graph
- Supervisor Prof. Dr. Stefan Weinzierl & Prof Dr. Tobias Hurth
- Final grade 1.0, equivalent to A grade
- Summary Application of particle physics integration framework to general relativity. Implementation of results in Mathematica and GiNaC.

Publication

- Philipp Kreer, Stefan Weinzierl: *The H-graph with equal masses in terms of multiple polylogarithms*, Physics Letters B, Volume 819, 2021, [arXiv:2104.07488](https://arxiv.org/abs/2104.07488).
- Philipp Kreer, Robert Runkel, Stefan Weinzierl: *Feynman integrals for binary systems of black holes*, 15th International Symposium on Radiative Corrections: Applications of Quantum Field Theory to Phenomenology, Tallahassee, FL, USA, 17-21 May 2021, [arXiv:2110.15654](https://arxiv.org/abs/2110.15654).

Bachelor's thesis

Title Maximal Cuts in Baikov Representation
Supervisor Prof. Dr. Stefan Weinzierl & Prof. Dr. Martin Reuter
Final grade 1.0, equivalent to A grade
Summary Development of integration techniques and application to Feynman integrals.

Further Education and Applied

Since summersemester 2019 **Teaching assistant**, Several lectures including: Mathematical preparation course for biologist, Theoretical Quantum Mechanics, Theoretical Classical Mechanics, Electrodynamics, Experimental Particle Physics.

March 2018 – July 2021 **Research Assistant as Assistant Operator in Control Center of Mainzer Mikrotron MAMI**, Maintenance and supervision of particle accelerator MAMI, interruption due to semester abroad.

October 2022 – December 2022 **G2Net Detecting Continuous Gravitational Waves**, Application of machine learning to gravitational wave detection, [kaggle competition](https://kaggle.com/competitions/g2net-detecting-gravitational-waves).

August 2023 **ML4Good AI Safety Bootcamp**, Implementation of modern AI architectures e.g. transformers, performing adversarial attacks, literature review on AI Alignment, theoretical physics concepts to interpret AI systems (Singular Learning Theory, Effective Field Theory of Deep Learning).

Social engagement

Winter semester 2023/24 **Read & Eat: Physics meets AI Safety**, Seminar on theoretical physics solutions towards AI interpretability and security.

Since May 2023 **Active participant in the local Effective Altruism Group Munich**.

Since October 2022 **Cooking tutor at Katholische Hochschulgemeinde der Ludwigs-Maximilian Universität**, Organising and cooking dinners for the christian student union of the Ludwigs-Maximilian University.

Since 2019 **Foodsaver for Foodsharing e.V.**, Initiative for a social and sustainable management of food.

- 2015 – 2016 **Management of the school group FAIRücktKREATIVnachHALTig.**
Course management and organization in the context of the all-day school program of the Willigis-Gymnasium in Mainz on the topics of sustainability, nature and responsibility for the environment and people.
- 2014–2015 **Support in management of school group History.**
Support in course management in the context of the all-day school program of the Willigis-Gymnasium in Mainz on several topics on history.

Awards

- 2015 4th place at regional competition Jugend-Forscht, special prize "Nature"
- 2016 Award of the German Mathematicians' Association for "outstanding performance in mathematics"
- 2016 Award of the German Mathematicians' Association for "outstanding performance in mathematics"
- 2016 Award for "special achievements in the subject of catholic religious education" from the Faculty of Catholic Theology of the Johannes Gutenberg University Mainz

Programming languages

See attachment IT-Skills Overview

Languages

German	Mothertongue
Hungarian	Mothertongue
French	Fluent
English	Fluent
Spanish	Basic

DALF C1

Further interests

- Trekking/ Mountaineering
- Calisthenics
- Philosophy
- Cooking