Martin Kärcher

Curriculum Vitae

General Information

Full name	Martin Kärcher
Date and place of birth	15th of October 1998 in Freiburg im Breisgau (Germany)
Current Affiliation	Laboratoire d'Astrophysique de Marseille (LAM), Centre de Physique Théorique (CPT)
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Education

11/2021– Ongoing	**PhD**, *Aix-Marseille University*, Marseille (France)
10/2019– 08/2021	**Master of Science**, *Ruprecht-Karls-University*, Heidelberg (Germany) Grade of the thesis: 1.0, Final grade: 1.0
10/2016– 09/2019	**Bachelor of Science**, *Ruprecht-Karls-University*, Heidelberg (Germany), Grade of the thesis with colloquium: 1.2, Final grade: 2.0
09/2008– 06/2016	**Abitur (A-levels)**, *Erasmus Gymnasium (academic high school)*, Denzlingen (Germany), Final grade: 2.1

PhD Thesis

Title	*Phenomenology and Detection of Modified Gravity Signatures with Large Scale Structure*
Supervisors	Assoc. Astro. Sylvain de la Torre PhD & Assoc. Prof. Julien Bel PhD
Focus	Ongoing project about making use of the environmental dependence of modified gravity models to improve the search and detection of signatures. Application and investigation of robust classification/assessment schemes for the environment in large scale structure. Utilization of both clustering and weak lensing of galaxies at first in simulations and then in observational data.

Master Thesis

Title	*General Investigation and Ghost-Hunting in Tensor-Inverse Gravity*
Supervisor	Prof. Dr. Luca Amendola
Focus	Investigation of a specific kind of modified gravity in the light of accelerated solutions without the necessity of a cosmological constant. In addition, exploration of the perturbations of the theory searching for instabilities and ghosts.

Bachelor Thesis

Title	*Characterizing star formation rates in galaxies hosting an active galactic nucleus*
Supervisors	Dr. Knud Jahnke & Dr. Bernd Husemann
Focus	Derivation of star formation rates of galaxies from optical spectra taken with an integral field unit. Statistical comparison of the star formation rates regarding the activity of the host galaxy's nucleus and the applied analysis technique.

Working/Teaching Experience

04/2021– 09/2021 **Student Assistant**, *Ruprecht-Karls-University*, Heidelberg (Germany)
I led a tutorial group for the lecture "General Relativity". I marked the solved exercise sheets handed in by the students and then presented the solution in an online tutorial.

11/2020– 02/2021 **Student Assistant**, *Ruprecht-Karls-University*, Heidelberg (Germany)
I assisted my master thesis supervisor with his cosmology lecture. In particular, I helped setting up the exam and proofread the exercise sheets.

09/2020– 10/2020
09/2019– 11/2019
09/2018– 11/2018 **Student Assistant**, *Ruprecht-Karls-University*, Heidelberg (Germany)
I supervised two experiments at the beginner's practical course 1 for physicists. I had to carry out short oral pre-examina and correct the lab protocols of the students. The experiments were about optical images and prism-spectroscopy.

02/2020– 05/2020 **Student Assistant**, *Ruprecht-Karls-University*, Heidelberg (Germany)
I supervised one experiment at the beginner's practical course 2 for physicists. I had to carry out short oral pre-examina and correct the lab protocols of the students. The experiment was about Fourier-optics.

02/2019– 05/2019 **Student Assistant**, *Ruprecht-Karls-University*, Heidelberg (Germany)
I supervised two experiments at the beginner's practical course 2 for physicists. I had to carry out short oral pre-examina and correct the lab protocols of the students. The experiments were about thermal noise and amplifying voltages.

12/2018–01/2019	**Student Assistant**, *Max-Planck-Institute for Medical Research*, Heidelberg (Germany)
	I supervised one experiment about building a rudimentary microscope in the practical course biophysical chemistry attended by students of molecular biotechnology. I had to carry out short oral pre-exmanina and correct the lab protocols of the students.

Computer Skills

Python	For the data analysis and visualization during my Bachelor thesis and currently for the PhD project.
Mathematica	For computation of matrix and tensor operations during the master thesis. Also used for numerically solving differential equations and visualization of results.
Latex	For written text and presentations.

Languages

German	Native
English	C1 (IELTS Academic test)
French	Beginner

Interests/Hobbies

- Mountain biking
- Folding and designing origami
- Python and Linux
- Drawing