



Universität Hamburg

DER FORSCHUNG | DER LEHRE | DER BILDUNG

FAKULTÄT

FÜR MATHEMATIK, INFORMATIK  
UND NATURWISSENSCHAFTEN

FINN WELZMÜLLER  
MASTER OF SCIENCE (MSC)  
PHYSICS

EXAMINATION CERTIFICATE

English translation of the original German document

Mr. Finn Welzmüller, born on 17 November 1997 in Hamburg, successfully passed the master's examination in Physics on 9 March 2022.

The following grades were achieved in the Master's exam, in line with the subject-specific provisions of 4 April 2018 for Physics at Universität Hamburg:

**Advanced Master's Courses**

Experimental astroparticle physics	excellent	(1,3)
Gravitational-wave detection	excellent	(1,0)
Quantum mechanics II	sufficient	(3,7)
Seminar on topics in low frequency radio astronomy*	excellent	(1,3)
Seminar Extragalactic Astrophysics*	excellent	(1,0)
Galaxy evolution*	excellent	(1,0)
Chemical evolution of the universe*	good	(2,3)
Computational astrophysics*	excellent	(1,0)
Introduction to general relativity and astrophysical applications*	good	(2,0)

**Complementary subject**

Modern problems of stellar astrophysics	excellent	(1,0)
Seminar on astrophysics	excellent	(1,3)
Software Development I	good	(1,7)

**Research Phase**

Introductory Project (Astronomy and astrophysics)	pass	(b)
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Grading system - per component: 1,0 / 1,3: excellent; 1,7 / 2,0 / 2,3: good; 2,7 / 3,0 / 3,3: satisfactory; 3,7 / 4,0: sufficient

Grading system - GPA: 1,0 to 1,50: excellent; 1,51 to 2,50: good; 2,51 to 3,50: satisfactory; 3,51 to 4,0: sufficient

\* = in original language

Preparatory project (Astronomy and astrophysics)

pass

(b)

## Master thesis

### Master's thesis

LOFAR constraints on WIMP cross-sections in Dwarf Spheroidal Galaxies  
(in original language)

excellent

(1,3)

## Final GPA

good

(1,53)

Hamburg, 6 April 2022

Signature of the Examination Office



ECTS Grade Distribution Table Overall Grade

Department/degree	excellent	good	satisfactory	sufficient
Phys/Master	66,27%/169/66,27%	32,55%/83/98,82%	1,18%/3/100,00%	0,00%/0/100,00%

As a rule, there is a minimum of 50 graduates per cohort; if applicable, a cohort with fewer graduates is indicated. A cohort or reference group is comprised of three academic years. The overall grades for the department-degree combination that are used for official statistics form the basis for the designation of a percentile ranking. The percentage, the absolute value, and the cumulative frequency are indicated.

Grading system - per component: 1,0 / 1,3: excellent; 1,7 / 2,0 / 2,3: good; 2,7 / 3,0 / 3,3: satisfactory; 3,7 / 4,0: sufficient

Grading system - GPA: 1,0 to 1,50 excellent; 1,51 to 2,50: good; 2,51 to 3,50: satisfactory; 3,51 to 4,0: sufficient

\* = in original language