Joachim Pomper

BSc

Am Brühlwald 2a
8075 Hart bei Graz
Austria
+43 664 73320390
joachim.pomper@edu.uni-graz.at
JoachimPomper
HoneyBadger220497

Personal information

Date of birth 22.04.1997

Nationality Austria

Education

2020-now **Master studies in theoretical and computational physics** , University of Technology Graz (TUG) and University of Graz (KFU).

2016-2020 **Bachelor studies in technical physics** , University of Technology Graz (TUG) and University of Graz (KFU).
Graduated with distinction (grade 1.0).

2007-2015 **School of general education**, BRG Petersgasse Graz.

2003 -2007 **Elementary school**, Sacré Coeur Graz.

Summer school programs

14.03.2022 - 25.03.2022 **Theoretical Aspects of Astroparticle Physics, Cosmology and Gravitation**, Galileo Galilei Institute.

Teaching

01.10.2022-31.01.2023 **Teaching assistant for advanced Quantum Mechanics**, *Institute of Theoretical Physics of KFU-Graz* , Physics master course.
Correcting homework and tutoring students in the subject of quantum mechanics.

01.10.2021-31.01.2022 **Teaching assistant for statistical physics**, *Institute of Theoretical Physics of KFU-Graz* , Physics master course.
Tutoring and grading of first semester master students in statistical physics.

01.10.2021-31.01.2022 **Teaching assistant for linear algebra**, *Institute of Applied Mathematics of TU-Graz*, Physics Bachelor course.
Tutoring and grading of first semester bachelor students in linear algebra.

01.3.2021-30.06.2021 **Teaching assistant for differential forms in the context of electromagnetism**, *Institute of Applied Mathematics of TU-Graz*, Mathematics master course.
Researching, writing and preparing lecture notes for a mathematics master's program special topic lecture on differential forms in the context of electromagnetism.

01.3.2021-30.06.2021 **Teaching assistant for vector-calculus**, *Institute of Applied Mathematics of TU-Graz*, Physics bachelor course.
Tutoring and grading of second semester bachelor students in vector-calculus.

01.10.2020-28.02.201 **Teaching assistant for calculus**, *Institute of Applied Mathematics of TU-Graz*, Physics Bachelor course.
Tutoring and grading of first semester bachelor students in basic calculus.

01.3.2019-30.06.2019 **Teaching assistant for programming in physics**, *Institute of Computational Physics of TU-Graz*, Physics bachelor course.
Tutoring students in basic Matlab programming.

01.10.2018-28.02.2019 **Teaching assistant for linear algebra**, *Institute of Applied Mathematics of TU-Graz*, Physics bachelor course.
Tutoring and grading of first semester bachelor students in linear algebra.

01.10.2017-28.02.2018 **Teaching assistant for linear algebra**, *Institute of Applied Mathematics of TU-Graz*, Physics bachelor course.
Tutoring and grading of first semester bachelor students in linear algebra.

Work

Part-time jobs

01.10.2019-30.09.2020 **Student trainee**, *BEST - Bioenergy and Sustainable Technologies, Area for automation and control*, https://best-research.eu.
Primarily focused on testing and developing software for hydraulic and thermal simulation of buildings and district heating grids

Internships

05.08.2018 - 30.09.2018 **Internship**, *BEST - Bioenergy and Sustainable Technologies, Subarea 4.2*.
Primarily focused on quality analysis of prediction models for a model predictive controller.

Languages

German	Mother tongue
English	fluent

Computer knowledge

Programming languages

Matlab	Advanced knowledge	*work experience*
Python	Basic knowledge	*university course*
Julia	Advanced knowledge	*work experience*
C++	Basic knowledge	*university course*
Mathematica	Basic knowledge	*self-taught*

Organization

Microsoft Office	Basic knowledge
Latex	Advanced knowledge, used for articles and presentations
Zotero	For structured literature management
Git	For software version control

Conference talks

I have had the pleasure to give a talk in the parallel sessions of two conference, one at international level, which took place in Sydney in Australia.

DSU2022 **Composite dark matter from non-abelian gauge theories with real representations**.
Presentation of results of my master's thesis

ÖPG2022 **Low energy effective description of dark Sp(4) theory with matter in non fundamental representation**.
Presentation of preliminary results of my master's thesis

Project selection from my time as a student

Bachelor thesis **Analytische Berechnung der spontanen Magnetisierung von isotropen homogenen Ising Ferromagneten unter der Verwendung von Graßmann Zahlen**.
Supervisor: Univ.-Prof. Dipl.-Phys. Dr.rer.nat. Wolfgang von der Linden

Master thesis (WIP) **Dark matter from an $Sp(4)$ gauge theory with fermions in the antisymmetric tensor representation**.
Supervisor: PD. Dr. Suchita Kulkarni

Uni course project **A simple way to explain phenomena at the horizon of a static black hole**.
Supervisor: Univ.-Prof. Dr.rer.nat. Reinhard Alkofer

Uni course project **Particle creation in an expanding universe**.
Supervisor: Univ.-Prof. Dr.rer.nat. Reinhard Alkofer

Uni course project **Functional renormalization group approach for interacting Dirac fermions**, *Wetterich equation applied to the Gross-Neveu-Model*.
Supervisor: Univ.-Prof. Dr.rer.nat. Reinhard Alkofer

For more information look at my personal website.

Further presentations during my time as a student

Besides the presentations above I also gave a talk in the institutes master seminar.

Master seminar **Introduction to dark matter phenomenology**.
General introduction to the topic of dark matter

Furthermore, I have gathered experience in reading, communicating and discussing research by presenting papers in my research groups journal club. Seven of the papers I presented are stated in terms of their arXiv numbers below.

[arXiv:hep-ph/2205.08088], [arXiv:gr-qc/1111.4824], [arXiv:gr-qc/0507028], [arXiv:hep-ph/2112.03755], [arXiv:astro-ph/1706.07433], [arXiv:hep-ph/1402.5143], [arXiv:hep-ph/1312.3325], [arXiv:hep-th/1803.07585], [arXiv:hep-th/9602093]

Transcript of records

NAWI Graz
Natural Sciences

Matrikelnummer	Kennzeichnung des Studiums
01530093	UF 033 678

Abschlusszeugnis

ausgestellt von der Technischen Universität Graz

FAMILIEN- oder NACHNAME Vorname(n)	Geburtsdatum
POMPER Joachim	**22.04.1997**

Studium
Bachelorstudium
Physik
[gemeinsames Studium mit der Universität Graz im Rahmen von NAWI Graz]

Gesetzliche Grundlage
Universitätsgesetz 2002, BGBl. I Nr. 120/2002 in der geltenden Fassung

Gesamtbeurteilung
mit Auszeichnung bestanden

Prüfungsfach	ECTS-Credits	Sem.-Std.	Datum	Beurteilung
Einführung in die Physik	**11,00**	**--**	**04.07.2017**	**sehr gut (1)**
Experimentalphysik	**18,00**	**--**	**02.10.2017**	**sehr gut (1)**
Mathematische Methoden, Grundlagen	**18,00**	**--**	**22.06.2017**	**sehr gut (1)**
Experimentelle Methoden, Grundlagen	**11,50**	**--**	**02.02.2018**	**sehr gut (1)**
Mathematische Methoden, Fortgeschrittene Techniken	**21,50**	**--**	**06.07.2018**	**sehr gut (1)**
Aufbau der Materie	**13,00**	**--**	**25.06.2020**	**sehr gut (1)**
Theoretische Mechanik und Quantenmechanik	**19,50**	**--**	**05.07.2018**	**sehr gut (1)**
Elektrodynamik und Thermodynamik	**15,50**	**--**	**12.02.2019**	**sehr gut (1)**
Wissenschaftliches Arbeiten	**8,00**	**--**	**22.09.2020**	**sehr gut (1)**
Vertiefungsrichtung Technische Physik:				
Grundlagen der Technischen Physik	**18,00**	**--**	**14.07.2020**	**sehr gut (1)**
Praktische Vertiefung der Technischen Physik	**16,00**	**--**	**01.08.2019**	**sehr gut (1)**
Freifach	**10,00**	**--**	**24.06.2020**	**mit Erfolg teilg.**

C 365197727

Abschlussdatum	Für den Vizerektor für Lehre
22.09.2020	**Univ.-Prof. Dipl.-Phys. Dr.rer.nat. Wolfgang von der Linden, Studiendekan**

Technische Universität Graz TU Vizerektor für Lehre

Beurteilung: sehr gut (1), gut (2), befriedigend (3), genügend (4), nicht genügend (5); mit Erfolg teilgenommen, ohne Erfolg teilgenommen

Gesamtbeurteilung: mit Auszeichnung bestanden, bestanden, nicht bestanden

UNIVERSITÄT GRAZ
UNIVERSITY OF GRAZ

Matriculation number	ID of degree programme
01530093	**UF 033 678**

Transcript

Last name, first name(s)	Date of birth
Pomper, Joachim	**22.04.1997**

Degree programme
Bachelor's programme; Physics (as an extramural student)

The following examinations have been taken:

Course/subject/module: Number/semester/type/title	ECTS	Semester hours WS	SS	Date	Assessment
PHYA10 16W Orientation lecture Introducton to Bachelor Study of Physics	0,50	0,50	---	2016-10-05	successfully completed
PHYB10 16W Lecture Experimental Physics I (Mechanics, Thermodynamics)	6,00	4,00	---	2017-02-06	excellent (1)
PHYC30 16W Lecture Differential- and Integral Calculations	6,00	4,00	---	2017-02-07	good (2)
PHYB30 17S Lecture Experimental Physics II (Electricity, Magnetism, Optics)	6,00	---	4,00	2017-10-02	excellent (1)
PHYG20_2UB 17W Practical Practical Exercises in Theoretical Mechanics	3,00	2,00	---	2018-02-05	excellent (1)
PHYE30UB 17W Lecture Functional analysis and partial differential equations	6,00	4,00	---	2018-02-08	excellent (1)
PHYF10UB 17W Lecture Atomic, nuclear and particle physics	6,00	4,00	---	2018-03-12	excellent (1)
PHYG40_2UB 18S Practical Exercises on Quantum Mechanics	4,00	---	2,00	2018-06-26	excellent (1)
PHYG30UB 18S Lecture Quantum Mechanics	6,50	---	4,00	2018-07-05	good (2)
MAB01012UB 17W Lecture Analysis 1	7,50	5,00	---	2018-10-18	good (2)
PHYH40UB 18W Practical Practical Exercises in Thermodynamics	2,00	1,00	---	2019-01-31	excellent (1)
PHYI10UB 18W Seminar Academic Writing and Presentation Techniques	2,00	2,00	---	2019-01-31	excellent (1)
PHYH30UB 18W Lecture Thermodynamics	3,00	2,00	---	2019-02-12	excellent (1)
PHYA70UB 19S Lecture Programming in Physics: C++ and Mathematica	2,00	---	2,00	2019-07-09	excellent (1)
PHYA80UB 19S Practical Exercises to Programming in Physics: C++ and Mathematica	3,00	---	2,00	2019-07-09	excellent (1)
MAT211UB 19W Practical Measure and Integration Theory	1,00	0,50	---	2020-01-31	excellent (1)

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Bachelor's programme; Physics (as an extramural student)

MAT210UB 19W Lecture Measure and Integration Theory	3,50	2,50	---	2020-02-25	excellent (1)
MAT156UB 20S Lecture/Practical Programming in C++	6,00	---	4,00	2020-06-24	excellent (1)
Total	74,00	49,50			

Date	Academic Affairs
24.06.2022	

UNIVERSITÄT GRAZ
UNIVERSITY OF GRAZ

Matriculation number	ID of degree programme
01530093	**UF 066 682**

Transcript

Last name, first name(s)	Date of birth
Pomper, Joachim	**22.04.1997**

Degree programme
Master's programme; Physics (as an extramural student)

The following examinations have been taken:

Course/subject/module: Number/semester/type/title	ECTS	Semester hours WS	SS	Date	Assessment
PHU001UB 20W Lecture Statistical Physics	4,00	2,00	---	2020-11-24	excellent (1)
PHM509UB 20W Lecture/Practical Computational Methods in Solid State Physics	3,00	2,00	---	2021-02-11	excellent (1)
PHU012UB 20W Lecture Advanced Statistical Physics	3,00	2,00	---	2021-02-12	excellent (1)
PHM508UB 20W Lecture/Practical Monte-Carlo Methods	3,00	2,00	---	2021-02-26	excellent (1)
PHM500UB 20W Lecture Advanced Mathematical Methods	4,50	3,00	---	2021-06-04	excellent (1)
PHM501UB 20W Practical Advanced Mathematical Methods	1,50	1,00	---	2021-06-04	excellent (1)
PHM504UB 21S Lecture Advanced Quantum Mechanics II	3,00	---	2,00	2021-06-24	excellent (1)
PHM503UB 21S Practical Quantum Field Theory	1,50	---	1,00	2021-07-05	excellent (1)
PHM502UB 21S Lecture Quantum Field Theory	4,50	---	3,00	2021-07-16	excellent (1)
PHM525UB 21S Lecture Hadron Physics	3,00	---	2,00	2021-07-29	excellent (1)
PHM524UB 21S Projekt Project in: "Foundations of Particle Physics"	3,00	---	2,00	2021-07-30	excellent (1)
PHM001UB 21W Lecture Introduction to General Relativity and Cosmology	3,00	2,00	---	2021-10-14	excellent (1)
PHM012_1UB 21W Seminar Master Seminar in the Area of the Master's Thesis (Particle Physics)	2,00	2,00	---	2022-02-08	excellent (1)
PHM520UB 21W Lecture/Practical Quantum Field Theory 2: Gauge Theories	6,00	4,00	---	2022-02-12	excellent (1)
PHM528UB 21W Projekt Project in: "Phenomenology of Particle Physics"	3,00	2,00	---	2022-02-23	excellent (1)
PHM802UB 21S Lecture Astroparticle Physics	3,00	---	2,00	2022-02-25	excellent (1)

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Pomper, Joachim	**22.04.1997**

Degree programme
Master's programme; Physics (as an extramural student)

PHM506UB 21W Lecture Basic Concepts in Solid-state Theory	3,00	2,00	---	2022-02-28	excellent (1)
Total	54,00	36,00			

Date	Academic Affairs
24.06.2022	

Graz University of Technology

Matriculation number	ID of degree programme
01530093	**UF 033 678**

Transcript

Last name, first name(s)	Date of birth
Pomper, Joachim BSc	**22.04.1997**

Degree programme
Bachelor's programme; Physics (as a degree student)

The following examinations have been taken:

Course/subject/module: Number/semester/type/title	ECTS	Semester hours WS	SS	Date	Assessment
PHYA30 16W Lecture/Practical Introduction to Mathematical Methods	1,00	1,00	---	2016-11-04	excellent (1)
PHYA20 16W Lecture Concepts and Applications of Modern Physics	1,50	1,50	---	2017-01-31	excellent (1)
PHYC20_1 16W Practical Linear Algebra	3,00	2,00	---	2017-02-27	excellent (1)
PHYC40_1 16W Practical Calculus	3,00	2,00	---	2017-02-27	excellent (1)
PHYA40 16W Lecture Introduction to Basic Chemistry	3,00	2,00	---	2017-03-01	excellent (1)
PHYC10 16W Lecture Elementary Mathematical Methods: Linear Algebra	3,00	2,00	---	2017-03-01	excellent (1)
PHYB20_1 16W Practical Experimental Physics I (Mechanics, Thermodynamics)	3,00	2,00	---	2017-03-08	excellent (1)
PHYC50 17S Lecture/Practical Ordinary Differential Equations	3,00	---	2,00	2017-06-22	excellent (1)
PHYD10_1 17S Lecture/Practical Introduction in measuring techniques	2,50	---	2,00	2017-06-26	excellent (1)
PHYE20_1 17S Practical Vector Analysis	3,00	---	2,00	2017-06-28	excellent (1)
PHYA50 17S Lecture Programming in Physics: Matlab	2,00	---	2,00	2017-07-04	excellent (1)
PHYA60 17S Practical Programming in Physics: Matlab	3,00	---	2,00	2017-07-04	excellent (1)
PHYD20_1 17S Laboratory practical Laboratory Course 1 (Mechanics and Thermodynamics)	3,00	---	3,00	2017-07-06	excellent (1)
PHYB40_1 17S Practical Experimental Physics II (Electricity, Magnetism, Optics)	3,00	---	2,00	2017-07-19	excellent (1)
PHYD30UF 17W Laboratory practical Laboratory Course 2 (Electricity Magnetism and Optics)	6,00	5,00	---	2018-02-02	excellent (1)
PHYG10UF 17W Lecture Theoretical Mechanics	6,00	4,00	---	2018-02-06	excellent (1)

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PHYE40_1UF 17W Practical Functional Analysis and Partial Differential Equations	3,00	2,00	---	2018-02-19	excellent (1)
PHYL10UF 18S Lecture Cryo Technology, Vacuum Technology, and Analysis Methods	4,50	---	3,00	2018-06-18	excellent (1)
PHYE60UF 18S Practical Probability Theory, Statistics and Data Analysis	2,00	---	1,00	2018-06-27	excellent (1)
PHYM30UF 18S Laboratory practical Introduction to mechanical applications	1,00	---	1,00	2018-06-28	excellent (1)
PHYE50UF 18S Lecture Mathematical Methods: Statistical Methods	3,00	---	2,00	2018-07-06	excellent (1)
PHYM20UF 18S Laboratory practical Electronics and Computer Supported Measurement Technique	2,50	---	2,00	2018-07-12	excellent (1)
PHYM10UF 18S Lecture Electronics and Computer Supported Measurement Technique	4,50	---	3,00	2018-12-13	excellent (1)
PHYH20UF 18W Practical Theoretical Electrodynamics	4,00	2,00	---	2019-02-01	excellent (1)
PHYH10UF 18W Lecture Theoretical Electrodynamics	6,50	4,00	---	2019-02-07	excellent (1)
PHYL30UF 18W Practical Computational Methods in Technical Physics	3,00	2,00	---	2019-03-05	excellent (1)
PHYL20UF 18W Lecture Computational Methods in Technical Physics	3,00	2,00	---	2019-03-12	excellent (1)
PHYF30UF 19S Practical Molecule and Solid State Physics Exercises	2,00	---	1,00	2019-06-25	excellent (1)
MAT152UF 19S Practical Analysis 2	3,00	---	2,00	2019-06-27	excellent (1)
PHYL50UF 19S Lecture/Practical Continuum and Fluid Mechanics	3,00	---	1,50	2019-07-04	excellent (1)
PHYM40UF 18W Laboratory practical Advanced Laboratory Technical Physics 1	4,00	2,50	---	2019-08-01	excellent (1)
PHYM50UF 19S Laboratory practical Advanced Laboratory Technical Physics 2	4,00	---	2,50	2019-08-01	excellent (1)
MAT151UF 19S Lecture Analysis 2	7,50	---	5,00	2019-10-28	excellent (1)
MAT208UF 19W Practical Computational Mathematics 1	1,50	1,00	---	2020-01-29	excellent (1)
MAT202UF 19W Practical Analysis 3	3,00	2,00	---	2020-02-05	excellent (1)
PHYF20UF 20S Lecture Molecule and solid state-physics	5,00	---	3,00	2020-06-25	excellent (1)
PHYL40UF 20S Lecture Physical Principles of Materials Science	4,50	---	3,00	2020-07-14	excellent (1)
MAT258UF 20S Practical Introduction to Functional Analysis	1,50	---	1,00	2020-08-28	excellent (1)
PHYI20_5UF 20S Project Bachelorarbeit	6,00	---	1,00	2020-09-22	excellent (1)

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Last name, first name(s)	Date of birth
Pomper, Joachim BSc	**22.04.1997**

Degree programme
Bachelor's programme; Physics (as a degree student)

Total	131,00	86,00		

Date	For the Rectorate:
24.06.2022	The Vice Rector for Academic Affairs: Univ.-Prof. Dipl.-Ing. Dr.techn. Stefan Vorbach

Graz University of Technology

Matriculation number	ID of degree programme
01530093	**UF 066 682**

Transcript

Last name, first name(s)	Date of birth
Pomper, Joachim BSc	**22.04.1997**

Degree programme
Master's programme; Physics (as a degree student)

The following examinations have been taken:

Course/subject/module: Number/semester/type/title	ECTS	Semester hours WS	SS	Date	Assessment
MAT207UF 19W Lecture Computational Mathematics 1	4,50	3,00	---	2020-11-03	excellent (1)
PHU002UF 20W Practical Statistical Physics	2,00	1,00	---	2021-01-22	excellent (1)
PHU004UF 20W Practical Advanced Quantum Mechanics	2,00	1,00	---	2021-01-27	excellent (1)
PHU003UF 20W Lecture Advanced Quantum Mechanics	4,00	2,00	---	2021-02-01	excellent (1)
MAT312UF 20W Practical Computational Mathematics 2	1,50	1,00	---	2021-02-02	excellent (1)
PHT508UF 21S Lecture/Practical Green´s Functions in Many-Particle Physics	3,00	---	2,00	2021-07-05	excellent (1)
MAT656UF 21S Lecture Elective Subject Mathematics (Electromagnetics and Differential Forms)	3,00	---	2,00	2021-09-03	excellent (1)
MAT311UF 20W Lecture Ordinary Differential Equations	4,50	3,00	---	2021-09-24	excellent (1)
Total	24,50	15,00			

Date	For the Rectorate:
24.06.2022	The Vice Rector for Academic Affairs: Univ.-Prof. Dipl.-Ing. Dr.techn. Stefan Vorbach