Joachim Pomper

BSc

Am Brühlwald 2a
8075 Hart bei Graz
Austria
+43 664 73320390
joachim.pomper@edu.uni-graz.at
joachim-pomper.github.io/homepage/
JoachimPomper
Joachim-Pomper

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.

01.10.2020-28.02.2021 **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)	**Low energy effective study of light pseudo-scalar mesons in $SO(N)$-like dark QCD**. 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**. 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. Nine 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

Graz University of Technology

Vizerektor für Lehre

Studiendekan Physik
Univ.-Prof. Dr.rer.nat.
Wolfgang von der Linden

Petersgasse 16, A-8010 Graz
Tel.: +43(0)316 873-8112
Fax: +43(0)316 873-8113

SB: Martina Pichler
physik.mpug@tugraz.at

Mr

Joachim Pomper

Date of Birth:	22.04.1997
Citizenship:	Austria
Code for study programme:	UF 033 678
Registration number:	01530093

NOTIFICATION

You have duly completed the inter-university

Bachelor programme
Physics
[joint study programme with the University of Graz in the framework of NAWI Graz]

according to the Universities Act 2002, BGBl. I No. 120/2002 at Graz University of Technology.

According to § 87 (1) Universities Act 2002 I herewith confer upon you the academic degree, to be used after your name, of

Bachelor of Science
(BSc)

Information on legal remedy:
This notification becomes legally valid on the date given below. Further information on legal remedy is waived.

Graz, 22.09.2020

For the: Vizerektor für Lehre

Univ.-Prof. Dipl.-Phys. Dr.rer.nat. Wolfgang von der Linden, Studiendekan

TECHNISCHE UNIVERSITÄT GRAZ
GRAZ UNIVERSITY OF TECHNOLOGY - AUSTRIA

Rechbauerstraße 12
8010 Graz
Österreich

TRANSCRIPT OF RECORDS

NAME OF STUDENT: **Pomper** **First name: Joachim**
Date of birth: 22 April 1997 **Academic degree:** BSc
Date of admission: 19 August 2016 **Matriculation number:** 01530093

Study: Bachelor programme; Physics;[joint study programme with the University of Graz in the framework of NAWI Graz] (as a degree student)

Number / Academic Year	Title of the course / type / semester hour	Duration of the course / examination / recognition date	Local grade	ECTS Credits
(1)	*(2)*	*(3)*	*(4)*	*(5)*
PHYA10 16/17	Introducton to Bachelor Study of Physics; SE; 0,50	1S / 05.10.2016*	successfully completed	0.50
PHYA30 16/17	Introduction to Mathematical Methods; SE; 1,00	1S / 04.11.2016	1	1.00
PHYA20 16/17	Concepts and Applications of Modern Physics; L; 1,50	1S / 31.01.2017	1	1.50
PHYB10 16/17	Experimental Physics I (Mechanics, Thermodynamics); L; 4,00	1S / 06.02.2017*	1	6.00
PHYC30 16/17	Differential- and Integral Calculations; L; 4,00	1S / 07.02.2017*	2	6.00
PHYC20_1 16/17	Linear Algebra; PE; 2,00	1S / 27.02.2017	1	3.00
PHYC40_1 16/17	Calculus; PE; 2,00	1S / 27.02.2017	1	3.00
PHYA40 16/17	Introduction to Basic Chemistry; L; 2,00	1S / 01.03.2017	1	3.00
PHYC10 16/17	Elementary Mathematical Methods: Linear Algebra; L; 2,00	1S / 01.03.2017	1	3.00
PHYB20_1 16/17	Experimental Physics I (Mechanics, Thermodynamics); PE; 2,00	1S / 08.03.2017	1	3.00
PHYC50 16/17	Ordinary Differential Equations; SE; 2,00	1S / 22.06.2017	1	3.00
PHYD10_1 16/17	Introduction in measuring techniques; SE; 2,00	1S / 26.06.2017	1	2.50
PHYE20_1 16/17	Vector Analysis; PE; 2,00	1S / 28.06.2017	1	3.00
PHYE10 16/17	Vector Analysis; L; 3,00	1S / 03.07.2017*	1	4.50
PHYA50 16/17	Programming in Physics: Matlab; L; 2,00	1S / 04.07.2017	1	2.00
PHYA60 16/17	Programming in Physics: Matlab; PE; 2,00	1S / 04.07.2017	1	3.00
PHYD20_1 16/17	Laboratory Course 1 (Mechanics and Thermodynamics); PE; 3,00	1S / 06.07.2017	1	3.00
PHYB40_1 16/17	Experimental Physics II (Electricity, Magnetism, Optics); PE; 2,00	1S / 19.07.2017	1	3.00
PHYB30 16/17	Experimental Physics II (Electricity, Magnetism, Optics); L; 4,00	1S / 02.10.2017*	1	6.00
PHYD30UF 17/18	Laboratory Course 2 (Electricity Magnetism and Optics); PE; 5,00	1S / 02.02.2018	1	6.00
PHYG20_2UB 17/18	Practical Exercises in Theoretical Mechanics; PE; 2,00	1S / 05.02.2018*	1	3.00
PHYG10UF 17/18	Theoretical Mechanics; L; 4,00	1S / 06.02.2018	1	6.00
PHYE30UB 17/18	Functional analysis and partial differential equations; L; 4,00	1S / 08.02.2018*	1	6.00
PHYE40_1UF 17/18	Functional Analysis and Partial Differential Equations; PE; 2,00	1S / 19.02.2018	1	3.00
PHYF10UB 17/18	Atomic, nuclear and particle physics; L; 4,00	1S / 12.03.2018*	1	6.00
PHYL10UF 17/18	Cryo Technology, Vacuum Technology, and Analysis	1S / 18.06.2018	1	4.50

* ... recognised

NAME OF STUDENT: **Pomper** **First name:** **Joachim**

Date of birth: 22 April 1997 **Academic degree:** BSc

Date of admission: 19 August 2016 **Matriculation number:** 01530093

Study: Bachelor programme; Physics;[joint study programme with the University of Graz in the framework of NAWI Graz] (as a degree student)

Number / Academic Year	Title of the course / type / semester hour	Duration of the course / examination / recognition date	Local grade	ECTS Credits
(1)	*(2)*	*(3)*	*(4)*	*(5)*
	Methods; L; 3,00			
PHYG40_2UB 17/18	Exercises on Quantum Mechanics; PE; 2,00	1S / 26.06.2018*	1	4.00
PHYE60UF 17/18	Probability Theory, Statistics and Data Analysis; PE; 1,00	1S / 27.06.2018	1	2.00
PHYM30UF 17/18	Introduction to mechanical applications; PE; 1,00	1S / 28.06.2018	1	1.00
PHYG30UB 17/18	Quantum Mechanics; L; 4,00	1S / 05.07.2018*	2	6.50
PHYE50UF 17/18	Mathematical Methods: Statistical Methods; L; 2,00	1S / 06.07.2018	1	3.00
PHYM20UF 17/18	Electronics and Computer Supported Measurement Technique; PE; 2,00	1S / 12.07.2018	1	2.50
MAB01012UB 17/18	Analysis 1; L; 5,00	1S / 18.10.2018	2	7.50
PHYM10UF 17/18	Electronics and Computer Supported Measurement Technique; L; 3,00	1S / 13.12.2018	1	4.50
PHYH40UB 18/19	Practical Exercises in Thermodynamics; PE; 1,00	1S / 31.01.2019*	1	2.00
PHYI10UB 18/19	Academic Writing and Presentation Techniques; SE; 2,00	1S / 31.01.2019*	1	2.00
PHYH20UF 18/19	Theoretical Electrodynamics; PE; 2,00	1S / 01.02.2019	1	4.00
PHYH10UF 18/19	Theoretical Electrodynamics; L; 4,00	1S / 07.02.2019	1	6.50
PHYH30UB 18/19	Thermodynamics; L; 2,00	1S / 12.02.2019*	1	3.00
PHYL30UF 18/19	Computational Methods in Technical Physics; PE; 2,00	1S / 05.03.2019	1	3.00
PHYL20UF 18/19	Computational Methods in Technical Physics; L; 2,00	1S / 12.03.2019	1	3.00
PHYF30UF 18/19	Molecule and Solid State Physics Exercises; PE; 1,00	1S / 25.06.2019	1	2.00
MAT152UF 18/19	Analysis 2; PE; 2,00	1S / 27.06.2019	1	3.00
PHYL50UF 18/19	Continuum and Fluid Mechanics; SE; 1,50	1S / 04.07.2019	1	3.00
PHYA70UB 18/19	Programming in Physics: C++ and Mathematica; L; 2,00	1S / 09.07.2019*	1	2.00
PHYA80UB 18/19	Exercises to Programming in Physics: C++ and Mathematica; PE; 2,00	1S / 09.07.2019*	1	3.00
PHYM40UF 18/19	Advanced Laboratory Technical Physics 1; PE; 2,50	1S / 01.08.2019	1	4.00
PHYM50UF 18/19	Advanced Laboratory Technical Physics 2; PE; 2,50	1S / 01.08.2019	1	4.00
MAT151UF 18/19	Analysis 2; L; 5,00	1S / 28.10.2019	1	7.50
MAT211UB 19/20	Measure and Integration Theory; PE; 0,50	1S / 31.01.2020*	1	1.00
MAT202UF 19/20	Analysis 3; PE; 2,00	1S / 05.02.2020	1	3.00
MAT210UB 19/20	Measure and Integration Theory; L; 2,50	1S / 25.02.2020*	1	3.50
MAT156UB 19/20	Programming in C++; SE; 4,00	1S / 24.06.2020	1	6.00
PHYF20UF 19/20	Molecule and solid state-physics; L; 3,00	1S / 25.06.2020	1	5.00
PHYL40UF 19/20	Physical Principles of Materials Science; L; 3,00	1S / 14.07.2020	1	4.50
MAT258UF 19/20	Introduction to Functional Analysis; PE; 1,00	1S / 28.08.2020	1	1.50
PHYI20_5UF 19/20	Bachelorarbeit; PE; 1,00	1S / 22.09.2020	1	6.00

* ... recognised

NAME OF STUDENT: **Pomper** **First name:** **Joachim**

Date of birth: 22 April 1997 **Academic degree:** BSc

Date of admission: 19 August 2016 **Matriculation number:** 01530093

Study: Bachelor programme; Physics;[joint study programme with the University of Graz in the framework of NAWI Graz] (as a degree student)

Number / Academic Year	Title of the course / type / semester hour	Duration of the course / examination / recognition date	Local grade	ECTS Credits
(1)	*(2)*	*(3)*	*(4)*	*(5)*
				208.00

(1) (2) (3) (4) (5) See explanations on next page

Certificate (678) 22 September 2020

Date

19 January 2023

For the Rectorate:

The Vice Rector for Academic Affairs: Univ.-Prof. Dipl.-Ing. Dr.techn. Stefan Vorbach

* ... recognised

ECTS - EUROPEAN CREDIT TRANSFER SYSTEM

Information available on the Europe server: http://ec.europa.eu/education/lifelong-learning-policy/doc48_en.htm

(1) **Number / Academic Year**

Information available on INTERNET: https://online.tugraz.at

(2) **Type of course**

SE = Seminar PE = Practical
L = Lecture
Semester hour: unit of academic credit: 45 minutes a week for one semester

(3) **Duration of course unit:**

Y = 1 full academic year
1S = 1 semester

(4) **Description of the institutional grading system:**

Austrian Grading Scale	Definition
1	EXCELLENT: outstanding performance
2	GOOD: above the average standard but with some errors
3	SATISFACTORY: generally sound work with a number of notable errors
4	SUFFICIENT: performance meets the minimum criteria
5	UNSATISFACTORY: Substantial improvement necessary; requirement of further work
successfully completed	Positive performance, where a strict differentiation is not adequate
not completed	Negative performance, where a strict differentiation is not adequate

Overall classification of the qualification:

"mit Auszeichnung bestanden"	Pass with Distinction (in case of excellent performance)
"bestanden"	Pass (in case of positive assessment)
"nicht bestanden"	Fail (in case of negative assessment)

Recommended ECTS grades:

Grade at TU Graz	ECTS grade
1	A
2	B
3	C
4	D/E
5	F

ECTS-Credits

1 Academic Year = 60
1 Semester = 30

TECHNISCHE UNIVERSITÄT GRAZ
GRAZ UNIVERSITY OF TECHNOLOGY - AUSTRIA

Rechbauerstraße 12
8010 Graz
Österreich

TRANSCRIPT OF RECORDS

NAME OF STUDENT: **Pomper** **First name:** **Joachim**
Date of birth: 22 April 1997 **Academic degree:** BSc
Date of admission: 29 September 2020 **Matriculation number:** 01530093

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

Number / Academic Year	Title of the course / type / semester hour	Duration of the course / examination / recognition date	Local grade	ECTS Credits
(1)	*(2)*	*(3)*	*(4)*	*(5)*
PHU001UB 20/21	Statistical Physics; L; 2,00	1S / 24.11.2020	1	4.00
PHU002UF 20/21	Statistical Physics; PE; 1,00	1S / 22.01.2021	1	2.00
PHU004UF 20/21	Advanced Quantum Mechanics; PE; 1,00	1S / 27.01.2021	1	2.00
PHU003UF 20/21	Advanced Quantum Mechanics; L; 2,00	1S / 01.02.2021	1	4.00
PHM509UB 20/21	Computational Methods in Solid State Physics; SE; 2,00	1S / 11.02.2021	1	3.00
PHU012UB 20/21	Advanced Statistical Physics; L; 2,00	1S / 12.02.2021	1	3.00
PHM508UB 20/21	Monte-Carlo Methods; SE; 2,00	1S / 26.02.2021	1	3.00
PHM500UB 20/21	Advanced Mathematical Methods; L; 3,00	1S / 04.06.2021	1	4.50
PHM501UB 20/21	Advanced Mathematical Methods; PE; 1,00	1S / 04.06.2021	1	1.50
PHM504UB 20/21	Advanced Quantum Mechanics II; L; 2,00	1S / 24.06.2021	1	3.00
PHM503UB 20/21	Quantum Field Theory; PE; 1,00	1S / 05.07.2021	1	1.50
PHT508UF 20/21	Green´s Functions in Many-Particle Physics; SE; 2,00	1S / 05.07.2021	1	3.00
PHM502UB 20/21	Quantum Field Theory; L; 3,00	1S / 16.07.2021	1	4.50
PHM525UB 20/21	Hadron Physics; L; 2,00	1S / 29.07.2021	1	3.00
PHM524UB 20/21	Project in: "Foundations of Particle Physics"; PE; 2,00	1S / 30.07.2021	1	3.00
MAT656UF 20/21	Elective Subject Mathematics (Electromagnetics and Differential Forms); L; 2,00	1S / 03.09.2021	1	3.00
PHM001UB 21/22	Introduction to General Relativity and Cosmology; L; 2,00	1S / 14.10.2021	1	3.00
PHM507UB 21/22	Numerical Methods in Linear Algebra; SE; 2,00	1S / 15.11.2021*	1	3.00
A00036996 21/22	M0.3 Master's Seminar in the Area of the Master's Thesis, SE; L; 2,00	1S / 08.02.2022	1	2.00
PHM520UB 21/22	Quantum Field Theory 2: Gauge Theories; SE; 4,00	1S / 12.02.2022	1	6.00
PHM528UB 21/22	Project in: "Phenomenology of Particle Physics"; PE; 2,00	1S / 23.02.2022	1	3.00
PHM802UB 20/21	Astroparticle Physics; L; 2,00	1S / 25.02.2022	1	3.00
PHM506UB 21/22	Basic Concepts in Solid-state Theory; L; 2,00	1S / 28.02.2022	1	3.00
PHM523UB 21/22	Advanced Mathematical Methods 2; L; 2,00	1S / 28.03.2022	1	3.00
PHM012_2UB 21/22	Master's Seminar in the Area of the Master's Thesis (Strong Interaction in QFT); SE; 2,00	1S / 28.06.2022	1	2.00

* ... recognised

NAME OF STUDENT: **Pomper** **First name:** **Joachim**

Date of birth: 22 April 1997 **Academic degree:** BSc

Date of admission: 29 September 2020 **Matriculation number:** 01530093

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

Number / Academic Year	Title of the course / type / semester hour	Duration of the course / examination / recognition date	Local grade	ECTS Credits
(1)	*(2)*	*(3)*	*(4)*	*(5)*
				76.00

(1) (2) (3) (4) (5) See explanations on next page

Date

19 January 2023

For the Rectorate:

The Vice Rector for Academic Affairs: Univ.-Prof. Dipl.-Ing. Dr.techn. Stefan Vorbach

ECTS - EUROPEAN CREDIT TRANSFER SYSTEM

Information available on the Europe server: http://ec.europa.eu/education/lifelong-learning-policy/doc48_en.htm

(1) **Number / Academic Year**

Information available on INTERNET: https://online.tugraz.at

(2) **Type of course**

SE = Seminar PE = Practical
L = Lecture
Semester hour: unit of academic credit: 45 minutes a week for one semester

(3) **Duration of course unit:**

Y = 1 full academic year
1S = 1 semester

(4) **Description of the institutional grading system:**

Austrian Grading Scale	Definition
1	EXCELLENT: outstanding performance
2	GOOD: above the average standard but with some errors
3	SATISFACTORY: generally sound work with a number of notable errors
4	SUFFICIENT: performance meets the minimum criteria
5	UNSATISFACTORY: Substantial improvement necessary; requirement of further work
successfully completed	Positive performance, where a strict differentiation is not adequate
not completed	Negative performance, where a strict differentiation is not adequate

Overall classification of the qualification:

"mit Auszeichnung bestanden"	Pass with Distinction (in case of excellent performance)
"bestanden"	Pass (in case of positive assessment)
"nicht bestanden"	Fail (in case of negative assessment)

Recommended ECTS grades:

Grade at TU Graz	ECTS grade
1	A
2	B
3	C
4	D/E
5	F

ECTS-Credits

1 Academic Year = 60
1 Semester = 30