Ernst-Moritz-Arndt-Universität Greifswald

Faculty of Mathematics and Natural Sciences

Examination Certificate

Bachelor of Science in Physics

Philipp Hacker

born on 15 June 1994 in Demmin

has passed the Bachelor Examination according to the specific Examination Regulations for the Bachelor of Science in Physics of 05 July 2010 with the overall mark

satisfactory (2.9)

Bachelor Thesis: Modenanregung in Yukawa-Bällen

good (2.0)

Prof. Dr. André Melzer
Prof. Dr. Lutz Schweikhard

Date of final examination: 28 September 2015

Embossed Seal of University

Prof. Dr. André Melzer
Chairman, Examination Committee
Bachelor of Science in Physics

Ernst-Moritz-Arndt-Universität Greifswald

Bachelor of Science

The Faculty of Mathematics and Natural Sciences
under its Dean Dr. rer. nat. Klaus Fesser,
University Professor of Theoretical Physics,
certifies that

Philipp Hacker

born on 15 June 1994 in Demmin

upon successfully completing the studies in

Physics

is admitted the degree of

Bachelor of Science (B.Sc.)

Greifswald, 28 September 2015

Embossed Seal
of University

Dean

ERNST MORITZ ARNDT
UNIVERSITÄT GREIFSWALD

Wissen
lockt.
Seit 1456

Transcript of Records

of the Faculty of Mathematics and Natural Sciences

Bachelor of Science in Physics

Philipp Hacker

born on 15 June 1994 in Demmin

Modules	Grade	Credit Points
Fundamentals		
Linear Algebra	4.0	9
Calculus 1	3.7	9
Calculus 2	4.0	9
Calculus 3 features theory	3.3	6
Modules Experimental Physics		
Experimental Physics 1	2.5	10
Experimental Physics 2	2.6	14
Experimental Physics 3	2.8	14
Experimental Physics 4	1.3	6
Experimental Physics 5	passed	6
Diagnostic Methods of Modern Physics	1.9	10
Modules Theoretical Physics		
Mathematical Methods in Physics	4.0	6
Theoretical Physics 1	3.0	9
Theoretical Physics 2	3.7	9
Theoretical Physics 3	3.7	9
Theoretical Physics 4	2.7	9
Modules Applied Subjects		
Electronics	2.6	12
Computational Physics	passed	7
Oral presentation methods	passed	2
Non-physics Elective Course: Mathematics		
Mathematics	3.6	10
Overview testing	2.7	4
Bachelor Thesis	2.0	10
Bachelor Grade	**2.9**	**180**

Date of final examination: 28 September 2015

Prof. Dr. André Melzer
Chairman, Examination Committee
Bachelor of Science in Physics

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This Diploma Supplement model was developed by the European Commission, Council of Europe and UNESCO/CEPS. The purpose of the supplement is to provide independent data to improve the international 'transparency' and fair academic and professional recognition of qualifications (diplomas, degrees, certificates etc.). It is designed to provide a description of the nature, level, context, content and status of the studies that were pursued and successfully completed by the individual named on the original qualification to which this supplement is appended. It should be free from any value judgements, equivalence statements or suggestions about recognition. Information in all eight sections should be provided. Where information is not provided, an explanation should give the reason.

1. HOLDER OF THE QUALIFICATION

1.1. Family Name / First Name
Hacker, Philipp

1.2 Date, Place, Country of Birth
15 June 1994, Demmin, Germany

1.3 Student ID Number or Code
140375

2. QUALIFICATION

2.1 Name of Qualification
Bachelor of Science – B.Sc.

Title Conferred (full, abbreviated; in original language)
n. a.

2.2 Main Fields of Study
Physics

2.3 Institution Awarding the Qualification (in original language)
Ernst-Moritz-Arndt-Universität Greifswald
Mathematisch-Naturwissenschaftliche Fakultät

Status (Type/Control)
University / State Institution

2.4 Institution Administering Studies
same

Status (Type/Control)
same/same

2.5 Language(s) of Instruction/Examination
German

3. LEVEL OF THE QUALIFICATION

3.1 Level
First degree

3.2 Official Length of Programme
Three years

3.3 Access Requirements
Higher Education Entrance Qualification (HEEQ) cf. Sec. 8.7. after 12 or 13 years

4. CONTENTS AND RESULTS GAINED

4.1 Mode of Study
Full-time

4.2 Programme Requirements
Students are introduced to modern theoretical and experimental methods in physics. Beyond this, experience in electronics and computational techniques is gained. As the programme is mainly research-oriented, students are required to submit a Thesis. The students complete their B.Sc. Thesis within a period of 300 hours.

4.3 Programme Details
See Transcript for list of courses and grades; and "Prüfungszeugnis" (Examination Certificate) for final examinations and topic of Thesis, including evaluations.

4.4 Grading Scheme
General grading scheme cf. 8.6

4.5 Overall Classification (in original language)
befriedigend

Accumulative examinations are weighed according to the number of credit points. The mark for Bachelor Thesis and Overview (Oral examination) become with the double one relative portion weights.

5. FUNCTION OF THE QUALIFICATION

5.1 Access to Higher Study
Qualifies to apply for admission to postgraduate study (master programme)

5.2 Professional Status
n. a.

6. ADDITIONAL INFORMATION

6.1 Additional Information

The University of Greifswald meets the quality requirements of a positive system accreditation for Higher Education Institutions.

6.2 Further Information Sources

About the institution: www.uni-greifswald.de; for national information sources cf. Sec. 8

7. CERTIFICATION

This Diploma Supplement refers to the following original documents:
Urkunde über die Verleihung des *Bachelor of Science*: **28 September 2015**
Prüfungszeugnis: **28 September 2015**
Transcript of Records: **28 September 2015**

Certification Date: 02. DEZ. 2015

Seal of University

Prof. Dr. André Melzer
Chairman, Examination Committee
Bachelor of Science in Physics

8. NATIONAL HIGHER EDUCATION SYSTEM

The information on the national higher education system on the following pages provides a context for the qualification and the type of higher education that awarded it (DSDoc 01/03.00)

8. INFORMATION ON THE GERMAN HIGHER EDUCATION SYSTEM [1]

8.1. Types of Institutions and Institutional Control

Higher education (HE) studies in Germany are offered at three types of *Hochschulen* [2]

- *Universitäten* (Universities), including various specialized institutions, comprise the whole range of academic disciplines. In the German tradition, universities are also institutional foci of, in particular, basic research, so that advanced stages of study have strong theoretical orientations and research-oriented components.
- *Fachhochschulen* (Universities of Applied Sciences): Programs concentrate in engineering and other technical disciplines, business-related studies, social work, and design areas. The common mission of applied research and development implies a distinct application-oriented focus and professional character of studies, which include one or two semesters of integrated and supervised work assignments in industry, enterprises or other relevant institutions.
- *Kunst- and Musikhochschulen* (Colleges of Art/Music, etc.) offer graduate studies for artistic careers in fine arts, performing arts and music; in such fields as directing, production, writing in theatre, film, and other media; and in a variety of design areas, architecture, media and communication.

[1] The information covers only aspects directly relevant to purposes of the Diploma Supplement. All Information as of 1 Jan 2000.

[2] Hochschule is the generic term for higher education institutions.

HE institutions are either state or state-recognized institutions. In their operations, including the organization of studies and the designation and award of degrees, they are both subject to HE legislation.

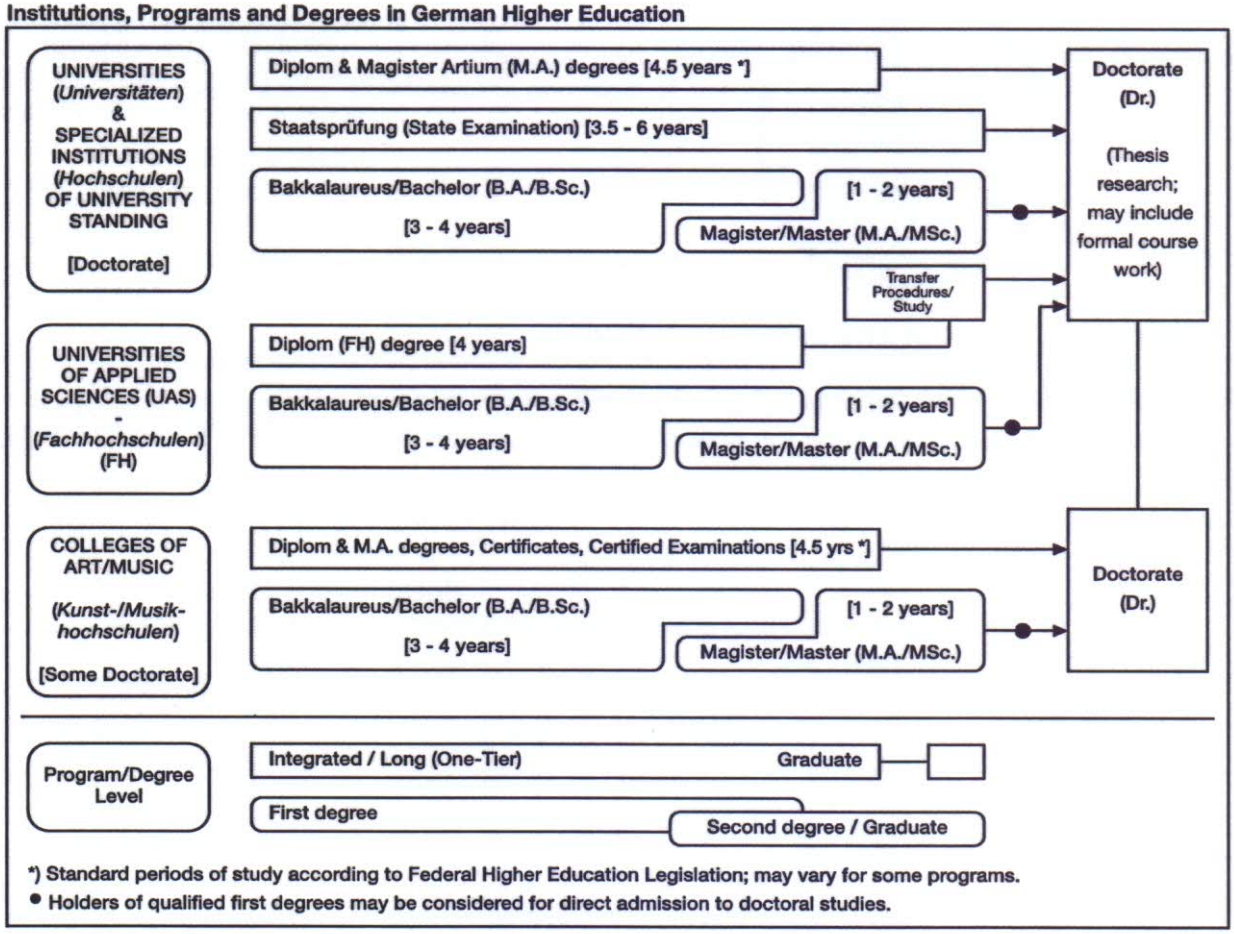
8.2 Types of programs and degrees awarded

- Studies in all three types of institutions are traditionally offered in integrated "long" (one-tier) programs leading to *Diplom-* or *Magister Artium* degrees or completion by a *Staatsprüfung* (State Examination).
- In 1998, a new scheme of first- and second-level degree programs (*Bakkalaureus*/Bachelor and *Magister*/Master) was introduced to be offered parallel to or *in lieu* of established integrated "long" programs. While these programs are designed to provide enlarged variety and flexibility to students in planning and pursuing educational objectives, they enhance also international compatibility of studies.
- For details cf. Sec. 8.41 and Sec. 8.42, respectively. Table 1 provides a synoptic summary.

8.3 Approval/Accreditation of Programs and Degrees

To ensure quality and comparability of qualifications, the organization of studies and general degree requirements have to conform to principles and regulations jointly established by the Standing Conference of Ministers of

Institutions, Programs and Degrees in German Higher Education



Education and Cultural Affairs of the *Länder* in the Federal Republic of Germany (KMK) and the Association of German Universities and other Higher Education Institutions (HRK). In 1999, a system of accreditation for programs of study has become operational under the control of an Accreditation Council at national level. Programs and qualifications accredited under this scheme are designated accordingly in the Diploma Supplement.

8.4 Organization of Studies

8.41 Integrated "Long" Programs (One-Tier):

Diplom* degrees, *Magister Artium*, *Staatsprüfung

Studies are either mono-disciplinary (single subject, *Diplom* degrees, most programs completed by a *Staatsprüfung*) or comprise a combination of either two major or one major and two minor fields (*Magister Artium*). As common characteristics, in the absence of intermediate (first-level) degrees, studies are divided into two stages. The first stage (1.5 to 2 years) focuses - without any components of general education - on broad orientations and foundations of the field(s) of study including propaedeutical subjects. An Intermediate Examination (*Diplom-Vorprüfung* for *Diplom* degrees; *Zwischenprüfung* or credit requirements for the M.A.) is prerequisite to enter the second stage of advanced studies and specializations. Degree requirements always include submission of a thesis (up to 6 months duration) and comprehensive final written and oral examinations. Similar regulations apply to studies leading to a *Staatsprüfung*.

- Studies at *Universities* last usually 4.5 years (*Diplom* degree, *Magister Artium*) or 3.5 to 6 years (*Staatsprüfung*). The *Diplom* degree is awarded in engineering disciplines, the exact/natural and economic sciences. In the humanities, the corresponding degree is usually the *Magister Artium* (M.A.). In the social sciences, the practice varies as a matter of institutional traditions. Studies preparing for the legal, medical, pharmaceutical and teaching professions are completed by a *Staatsprüfung*.
  The three qualifications are academically equivalent. As the final (and only) degrees offered in these programs at graduate-level, they qualify to apply for admission to doctoral studies, cf. Sec. 8.5.
- Studies at *Fachhochschulen (FH)* /Universities of Applied Sciences (UAS) last 4 years and lead to a *Diplom (FH)* degree. While the *FH*/UAS are non-doctorate granting institutions, qualified graduates may pursue doctoral work at doctorate-granting institutions, cf. Sec. 8.5.
- Studies at *Kunst- and Musikhochschulen* (Colleges of Art/Music, etc.) are more flexible in their organization, depending on the field and individual objectives. In addition to Diplom/Magister degrees, awards include Certificates and Certified Examinations for specialized areas and professional purposes.

8.42 First/Second Degree Programs (Two-tier): *Bakkalaureus*/Bachelor, *Magister*/Master degrees

These programs apply to all three types of institutions. Their organization makes use of credit point systems and modular components. First degree programs (3 to 4 years) lead to *Bakkalaureus*/Bachelor degrees (B.A., B.Sc.). Graduate second degree programs (1 to 2 years) lead to *Magister*/Master degrees (M.A., M.Sc.). Both may be awarded in dedicated form to indicate particular specializations or applied/professional orientations (B./M. of ... ; B.A., B.Sc. or M.A., M.Sc. in ...). All degrees include a thesis requirement.

8.5 Doctorate

Universities, most specialized institutions and some Colleges of Art/Music are doctorate-granting institutions. Formal prerequisite for admission to doctoral work is a qualified *Diplom* or *Magister*/Master degree, a *Staatsprüfung*, or a foreign equivalent. Admission further requires the acceptance of the Dissertation research project by a supervisor. Holders of a qualified *Diplom (FH)* degree or other first degrees may be admitted for doctoral studies with specified additional requirements.

8.6 Grading Scheme

The grading scheme usually comprises five levels (with numerical equivalents; intermediate grades may be given): "*Sehr Gut*" (1) = Very Good; "*Gut*" (2) = Good; "*Befriedigend*" (3) = Satisfactory; "*Ausreichend*" (4) = Sufficient; "*Nicht ausreichend*" (5) = Non-Sufficient/Fail. The minimum passing grade is "*Ausreichend*" (4). Verbal designations of grades may vary in some cases and for doctoral degrees. Some institutions may also use the ECTS grading scheme.

8.7 Access to Higher Education

The General Higher Education Entrance Qualification (*Allgemeine Hochschulreife, Abitur*) after 12 to 13 years of schooling gives access to all higher education studies. Specialized variants (*Fachgebundene Hochschulreife*) allow for admission to particular disciplines. Access to *Fachhochschulen*/(UAS) is also possible after 12 years (*Fachhochschulreife*). Admission to Colleges of Art/Music may be based on other or require additional evidence demonstrating individual aptitude.

8.8 National Sources of Information

- *Kultusministerkonferenz* (KMK) [Standing Conference of Ministers of Education and Cultural Affairs of the Länder in the Federal Republic of Germany] - Lennéstrasse 6, D-53113 Bonn;
  Fax: +49/[0]228/501-229; with
  - Central Office for Foreign Education (ZaB) as German NARIC and ENIC; www.kmk.org; E-Mail: zab@kmk.org
  - "Documentation and Educational Information Service" as German EURYDICE-Unit, providing the national dossier on the education system (EURYBASE, annual update, www.eurydice.org; E-Mail eurydice@kmk.org).
- *Hochschulrektorenkonferenz* (HRK) [Association of German Universities and other Higher Education Institutions]. Its "Higher Education Compass" (www.higher-education-compass.hrk.de) features comprehensive information on institutions, programs of study, etc. Ahrstrasse 39, D-53175 Bonn; Fax: +49/[0]228 / 887-210; E-Mail: sekr@hrk.de