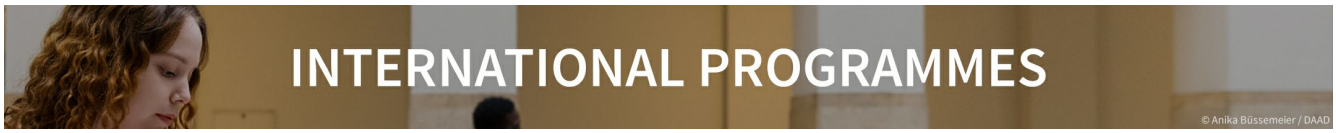
Deutscher Akademischer Austauschdienst
German Academic Exchange Service

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# Doctorate

## Berlin Mathematical School – PhD Programme

**Technische Universität Berlin** • Berlin





## Overview

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| **Degree** | Dr rer nat |
| **In cooperation with** | Freie Universität Berlin, Institute of Mathematics<br>Humboldt-Universität zu Berlin, Institute of Mathematics |
| **Teaching language** | • English |
| **Languages** | Courses are held in English. Participants can choose to write the dissertation in English or in German.<br><br>The BMS offers assistance to those international students with little or no German language skills by covering the costs of one preparatory language course in German as a Foreign Language ("Deutsch als Fremdsprache", also known as "DaF"). |
| **Programme duration** | 6 semesters |
| **Beginning** | Only for doctoral programmes: any time |
| **Application deadline** | The **first-round** application deadline of **1 December 2024** is for<br>- Phase I applicants requiring **admission with a scholarship** and<br>- Phase II applicants who want to start in April, May, June or July 2025.<br><br>The **second-round** application deadline of **1 April 2025** is for<br>- Phase I applicants requiring admission only and<br>- Phase II applicants who want to start in August, September or October 2025. |
| **Tuition fees per semester in EUR** | None |
| **Combined Master's degree / PhD programme** | Yes |
| **Joint degree / double degree programme** | No |
| **Description/content** | The Berlin Mathematical School (BMS) is the joint doctoral programme of the three Berlin universities and the graduate school of the Cluster of Excellence MATH+. Areas of expertise include: |

- Geometry and topology
- Algebraic geometry and number theory
- Stochastics and mathematical finance
- Discrete mathematics and optimisation
- Discrete geometry
- Numerical mathematics
- Applied analysis
- Mathematics for AI

# Course Details

**Course organisation**

The BMS programme is divided into two phases:
**Phase I** (four semesters) leads students from the Bachelor's degree to the BMS Qualifying Exam. Each student is registered as a Master's student at one of the three universities and has a Phase I adviser at the same university.
Phase I requires students to successfully complete five core courses and at least two advanced courses, including a seminar. The BMS core course programme is held in English and is coordinated between the three universities. Students are expected to attend the MATH+ Friday Colloquia regularly.
At the end of Phase I, students have to pass an oral "Qualifying Exam" in order to continue on to Phase II. Phase I students must also use Phase I to find a supervisor for their dissertation research in Phase II. Attending more than the one mandatory seminar is a good way to get to know professors and their research, to find out what the open questions in the field are and whether a professor is willing to take on a new PhD student. Every student has the possibility to earn an MSc at the end of Phase I.
**Phase II** is the research phase of the BMS PhD programme. BMS doctoral candidates should take advantage of the many opportunities offered by Berlin's mathematics research environment, including: DFG Research Training Groups (RTG), International Max Planck Research Schools (IMPRS), etc.

- The complete list of units
- A list of classes for each semester
- A timeline of the PhD process

**MATH+ Fridays – Kovalevskaya Colloquium**
Each semester, MATH+ designates one of the MATH+ Friday colloquia as the Sonia Kovalevskaya Colloquium. This lecture features female mathematicians who are invited to share their experiences as women in the field of mathematics. The lecture is preceded by an informal lunch for female students. This gives female students the opportunity to talk to an outstanding female mathematician about career paths and to exchange information about their experiences.

**Mentoring**
The BMS mentoring programme was developed to provide individual guidance to BMS students in both their academic and personal development.

**Soft Skills Seminars**
The BMS offers soft skills seminars in order to help students develop the necessary skills for a career in mathematics, in academia or in the private sector.

**Support for Students with Children**
BMS provides additional support for students with children and students who are pregnant.

**International elements**

- International guest lecturers
- Language training provided
- Training in intercultural skills

**Description of other international elements**

**MATH+ Fridays**
The MATH+ Friday colloquium (MATH+ Friday) is a lecture series given by distinguished

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| | mathematicians from all over the world. Each speaker explains how their research fits into the mathematical landscape in general, remarks on open problems, and demonstrates applications and analogies in other fields of mathematics and beyond. The aim is to offer a broad overview of a specific research area to enable everyone in the audience to grasp the main concepts involved. |
| **Integrated internships** | Phase I students can participate in the exchange programmes offered byFreie Universität Berlin (FU), Humboldt-Universität zu Berlin (HU) or Technische Universität Berlin (TU). Research visits can be arranged individually for Phase II students. |
| **Teaching/work obligations or opportunities** | There are teaching opportunities at all three participating universities. Depending on language skills and mathematical background, teaching experience can be gained as a tutor in undergraduate or graduate courses. |
| **Special promotion / funding of the programme** | • DFG (e.g. Research Training Groups) |
| **Course-specific, integrated German language courses** | No |
| **Course-specific, integrated English language courses** | No |

## Costs / Funding

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| **Tuition fees per semester in EUR** | None |
| **Semester contribution** | FU Berlin: 295.49 EUR<br>HU Berlin: 290.99 EUR<br>TU Berlin: 290.44 EUR |
| **Costs of living** | Please have a look at our BMS Guidebook, chapter 5.7 "Cost of Living" (page 32) at: http://www.math-berlin.de/images/guidebook.pdf |
| **Funding opportunities within the university** | Yes |
| **Description of the above-mentioned funding opportunities within the university** | The BMS offers scholarships for both Phase I and Phase II students. Scholarships are funded under the "Excellence Strategy" of the German Science Foundation, DFG, and by the three Berlin universities: FU Berlin, HU Berlin and TU Berlin. Phase I scholarships are usually granted for 18 months (extendable by six months), and amount to 1,000 EUR per month, tax free (no insurances included). Phase II scholarships are typically granted for 24 months (extendable by 12 months), and usually amount to 1,600 EUR, tax free (no insurances included).<br>For further information, go to: https://www.math-berlin.de/students/scholarships<br>Extra childcare funds are reserved for BMS students with children.<br>For further information, please see: https://www.math-berlin.de/students/resources/for-student-parents |

## Requirements / Registration

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| **Academic admission requirements** | Bachelor's degree (or equivalent) in mathematics (or equivalent) forPhase I, Master's degree (or equivalent) in mathematics (or equivalent) for Phase II<br><br>Application information<br><br>First, download our BMS PhD application guidelines and read them thoroughly**before** beginning the online application process. |
| **Language requirements** | German language proficiency is not required.<br><br>Applicants must provide proof of their English skills with one of the following certificates:<br><br>• TOEFL minimum of 550 (paper-based test), 213 (computer-based), 79 (Internet-based)<br>• IELTS minimum of 6.5<br>• CPE minimum level C<br>• CAE minimum level C<br><br>https://www.math-berlin.de/application/faqs/standard-tests |
| **Application deadline** | The **first-round** application deadline of **1 December 2024** is for<br>- Phase I applicants requiring **admission with a scholarship** and<br>- Phase II applicants who want to start in April, May, June or July 2025.<br><br>The **second-round** application deadline of **1 April 2025** is for<br>- Phase I applicants requiring admission only and<br>- Phase II applicants who want to start in August, September or October 2025. |
| **Submit application to** | BMS online application portal |

# Services

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| **Possibility of finding part-time employment** | There are teaching opportunities at all three participating universities. Depending on language skills and mathematical background, teaching experience can be gained as a tutor in undergraduate or graduate courses.<br><br>TU Berlin<br>FU Berlin<br>HU Berlin |
| **Accommodation** | Due to various factors, including the increasing number of immigrants, international students, as well as the increase in mobility of the population in general, the housing situation in Berlin has become very competitive. Since there is no campus accommodation in Berlin, we recommend beginning your search for private accommodation as early as possible!<br><br>Affordable accommodation will relieve the strain on a student budget enormously. Rent is the largest monthly expense for students, on average about 450 EUR per month for a single room. However, the amount of rent depends mainly on the type of accommodation and where it is located.<br><br>**Student Accommodation for BMS Students**<br>Each year, ten rooms in the "**Studentendorf Schlachtensee**" student village and five rooms in the "Studentendorf Adlershof" are offered exclusively to new BMS students. Each room is fully furnished with a bed, bedlinen, cupboards, shelves, a desk and a chair. Shared bathrooms and kitchens are fully equipped. Available on-site is a free gym, music rooms, study rooms, a launderette, a supermarket and a student-run bar. The rental period is fixed for one year and starts |

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| | on 1 September and ends on 31 August. This offer is available on a "first come, first serve" basis.<br><br>For more information, please have a look at our**BMS Guidebook**, chapter 5.6 "Accommodation" (from page 24 to 26).<br><br>Students who receive DAAD scholarships can apply for student accommodation via the**DAAD**. |
| **Structured research and supervision** | Yes |
| **Research training / discussion** | Yes |
| **Career advisory service** | FU Berlin: http://www.fu-berlin.de/en/sites/career/index.html<br>HU Berlin: https://www.hu-berlin.de/de/career-center<br>TU Berlin: https://www.tu.berlin/en/careerservice/services/<br><br>Once a year, the BMS offers a "Meet the BMS Alumni" event or a "Career Day" for our BMS students. |
| **Support for international students and doctoral candidates** | • Buddy programme<br>• Welcome event<br>• Cultural and linguistic preparation |
| **General services and support for international students and doctoral candidates** | The One-Stop Office supports BMS students in various administrative issues ranging from travel, visa, housing, and bureaucratic issues to language courses, childcare, and music and sports opportunities. In September, around four weeks before the first semester begins, the BMS offers a German as a Foreign Language course to support those international students with little or no German language skills. In October, one week before the winter semester lectures begin, the "BMS Orientation" takes place. This five-day schedule of activities is designed to welcome new students to the BMS and to provide an opportunity for the One-Stop Office staff to offer them assistance with university registration. It also aims to provide the new students with the opportunity to learn about their new place of study and for them to get to know the other students. Orientation activities also include an intercultural training and a walking tour of Berlin. |

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### Giulia C.
MSc

I was really excited to have the chance to join the BMS family for Phase II! In this past year and a half, I've experienced more of what the BMS has to offer: workshops to help learn to navigate PhD life, the "What is..." seminars in which topics from all over the mathematical spectrum are introduced by and for students; wine and cheese parties; board games; and most importantly, a welcoming and diverse mathematical community.

## Our Partners

FREIE UNIVERSITÄT BERLIN

HUMBOLDT-UNIVERSITÄT ZU BERLIN

### BMS Certificate Ceremony 2022

The BMS celebrates its graduates in July 2022 at the BBAW (Berlin-Brandenburg Academy of Sciences and Humanities). Students and alumni talk about the Berlin Mathematical School in this video.

» more: https://www.youtube.com/watch?v=qRj3dnaGF84

# Technische Universität Berlin


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Information about the three Berlin universities FU, HU & TU:

The FU Berlin has approximately 33,500 undergraduate students in 173 degree programmes (as of winter semester 2022/23). Of these, 13% of students in Bachelor's degree programmes and 29% of students in Master's degree programmes come from outside Germany, as do 38% of its 4,000 doctoral students (as of 2022). The university is made up of eleven departments, one joint medical school with HU Berlin and three central institutes. Most of its facilities are located in the leafy residential district of Dahlem, south-west of Berlin.
Institute of Mathematics

Humboldt-Universität zu Berlin (HU Berlin), founded in 1810 by the liberal Prussian educational reformer and linguist Wilhelm von Humboldt, is Berlin's oldest university. The foundation concept put forward by Humboldt envisaged a "universitas litterarum", which would achieve a unity of teaching and research as well as provide students with an all-round humanist education. Today HU Berlin is a public university offering more than 170 degree courses to over 36,500 students (excluding Charité), 58% of whom are female students and 15% of whom are international (as of winter semester 2022/23). The university is made up of nine faculties, five central institutes, five central units and nine interdisciplinary centres. The natural science institutes of the HU are located at Adlershof in the south of Berlin.
Institute of Mathematics

Technische Universität Berlin (TU Berlin) was founded in 1879 as the result of a merger between the School of Architecture (est. 1799) and the Academy of Trade (est. 1821). It was closed at the end of World War II and re-established under its current name in 1946. Although it was Germany's first technical university, its educational mission was reallocated post-WWII to include an emphasis on "universal education". By including the humanities in its compendium of subjects, the TU became the first technical university in Germany to present a humanistic element in its scholastic profile. TU Berlin has approximately 35,000 students, 34% of whom are female and 29% of whom are international (as of the 2023/24 winter semester). The seven faculties offer more than 100 degree courses, and the main campus is located in the district of Charlottenburg.
Institute of Mathematics

## University location

Berlin is Germany's capital city and a major centre of European politics, culture, media and science. It also serves as a continental hub for air and rail transport. The city's economy is primarily based on the service sector, which encompasses a diverse range of creative industries, media corporations, environmental services, congress, and convention venues.

Berlin is the third most visited tourist destination in the EU and home to world-renowned universities, research institutes, sporting events, orchestras, museums and media personalities. Its urban landscape and historical legacy have also made it a popular setting for international film productions. Recognised for its festivals, contemporary architecture, nightlife and avant-garde arts, Berlin has evolved into a focal point for individuals attracted by its liberal lifestyle, modern "zeitgeist" and low-cost living. It is home to 3.7 million people from over 190 countries.

First documented in the 13th century, Berlin was successively the capital of the Kingdom of Prussia (1701-1918), the German empire (1871-1918), the Weimar Republic (1919-1932) and the Third Reich (1933-1945). After World War II the city was divided: East Berlin became the capital of the GDR (East Germany) while West Berlin remained a West German enclave surrounded by the Berlin Wall from 1961-1989. It was possible for people from the west to go to the east, but only through strictly controlled checkpoints. For most East Germans, travel to West Berlin or West Germany was no longer possible. In 1971, the “Four Power Agreement on Berlin” (drawn up by the wartime allies France, UK, USA and USSR) re-established ties between the two parts of Berlin, improved travel and communications, and brought numerous improvements for the residents of the Western Sectors.

In 1989, pressure from the East German population brought the transition to a parliamentary democracy in East Germany. When the Berlin Wall fell on 9 November 1989, its citizens gained free access to the west. In Friedrichshain, a 1.3 km stretch of the Berlin Wall, known as the East Side Gallery, has been preserved as an international memorial for freedom. On 3 October 1990, East and West Germany reunited and became the Federal Republic of Germany. Berlin became the German capital in accordance with the unification treaty. The German parliament and government moved from Bonn back to Berlin in 1999.

Berlin is divided into twelve districts (Bezirke), each district is subdivided into a number of sub-districts (Ortsteile), and Berlin consists of 95 such sub-districts. In the past these areas were independent towns, villages and rural communities, and some of the subdistricts in Berlin are now known as a “Kiez”. A term with a positive connotation, the word is of Slavonic origin and refers to a settlement. Its inhabitants often identify with the “Kiez” they live in. A Berliner “Kiez” usually consists mainly of pre-war buildings and upholds its own commercial and cultural infrastructure. Some of the more well-known ones are the “Akazienkiez” in Schöneberg, the “Körnerkiez” in Neukölln and the “Kollwitzkiez” in Prenzlauer Berg.

**Berlin Tourist Information**
**City Information in English**

# Contact

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Berlin Mathematical School
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https://twitter.com/berlinmath

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https://www.instagram.com/berlin_mathematical_school/

https://www.youtube.com/channel/UC_nD1OERb8xs2YcON8b8FhA

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