



Berlin Mathematical School

Established in 2006

A joint graduate school of

Freie Universität

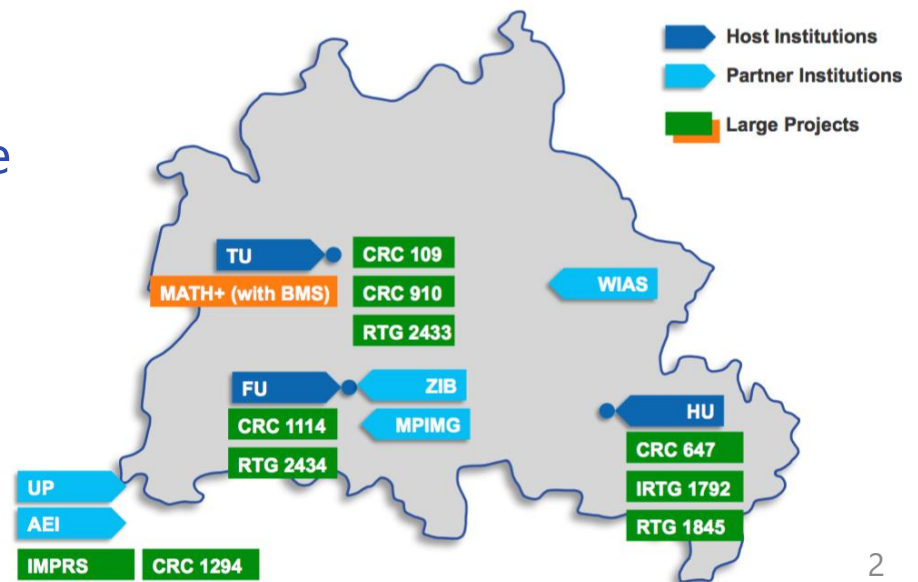


Berlin



Berlin Mathematical School

- Joint graduate school of the Berlin math departments (FU, HU, TU)
- Funded 2006 – 2018 by the German “Excellence Initiative”
- Since 2019 part of Cluster of Excellence MATH+ funded by the German “Excellence Strategy”
- Combines Berlin’s broad expertise in mathematics into an excellent environment for graduate studies



BMS Research Areas

1. Differential geometry, global analysis, and mathematical physics
2. Algebraic and arithmetic geometry, number theory
3. Probability, statistics, and financial mathematics
4. Discrete mathematics and combinatorial optimization
5. Geometry, topology, and visualization
6. Numerical mathematics and scientific computing
7. Applied analysis and differential equations
8. Mathematics of Data Science



Two-phase English-language study program

Bachelor	Phase I			Phase II						
	1	2	3	4	5	6	7	8	9	
	Basic courses			QE	Thesis research					
	Advanced courses									
BMS Fridays, soft skills, summer schools, ...										

Phase I

- Admission with a bachelor's degree
- Usually 3 - 4 semesters
- Phase I requirements:
 - 5 Basic Courses
 - 2 Advanced Courses and one seminar with a paper
- BMS Friday colloquia
- Mentor and advisor
- Ends with BMS Qualifying Exam to enter Phase II



BMS Basic Courses

	Area	BMS Course	FU Course Name	HU Course Name	TU Course Name
Basic	1: Differential geometry, global analysis, and	Analysis and geometry on manifolds	Differentialgeometrie II	Differentialgeometrie I	Differentialgeometrie II
		Riemannian geometry	Differentialgeometrie I	Differentialgeometrie II	
	2: Algebraic and arithmetic geometry, number theory	Commutative algebra	Algebra I, Number Theory I	Algebra II	Algebra II
		Algebraic geometry	Algebra II	Algebraische Geometrie I	Algebraic Geometry I
		Number Theory	Number Theory II	Algebraische Geometrie II	
	3: Stochastics and mathematical finance	Stochastic processes I: discrete time	Stochastik II	Stochastik II	Wahrscheinlichkeitstheorie II
		Stochastic processes II: continuous time		Stochastische Analysis	Wahrscheinlichkeitstheorie III
	4: Discrete mathematics and optimization	Combinatorics	Diskrete Mathematik I		Diskrete Strukturen I / Kombinatorik
		Discrete optimization	Diskrete Mathematik II* / Algorithmic Combinatorics		Diskrete Optimierung (ADM II)
		Nonlinear optimization		Nichtlineare Optimierung	Nichtlineare Optimierung
	5: Geometry, topology, and visualization	Classical geometries	Geometrie		Geometrie I
		Discrete geometry	Diskrete Geometrie I		Diskrete Geometrie / Konvexgeometrie I
		Discrete differential geometry and visualization	Scientific Visualization		Geometrie II
		Algebraic topology	Topologie I	Topologie I	Topologie
	6: Numerical analysis and scientific computing	Numerical methods for ODEs and numerical linear algebra	Numerik II	Numerik gewöhnlicher Differentialgleichungen	Numerische Mathematik II
		Numerical methods for PDEs	Numerik III	Numerik partieller Differentialgleichungen I	Numerik partieller Differentialgleichungen
	7: Applied analysis and differential equations	Dynamical systems	Differentialgleichungen I*		Mathematische Physik I
		Partial differential equations	Differentialgleichungen I* / Differentialgleichungen II*	Partielle Differentialgleichungen	Differentialgleichungen IIA + Differentialgleichungen IIB
		Functional analysis	Funktionalanalysis	Funktionalanalysis	Funktionalanalysis I
	8: Mathematics of data science	Statistical methods for data science		Methoden der Statistik	Mathematische Statistik
		Analysis of high-dimensional data		Nichtparametrische Statistik	Funktionalanalysis III
	Additional	Complex analysis	Funktionentheorie		Komplexe Analysis I

<http://www.math-berlin.de/images/bms-basic-course-dictionary.pdf>

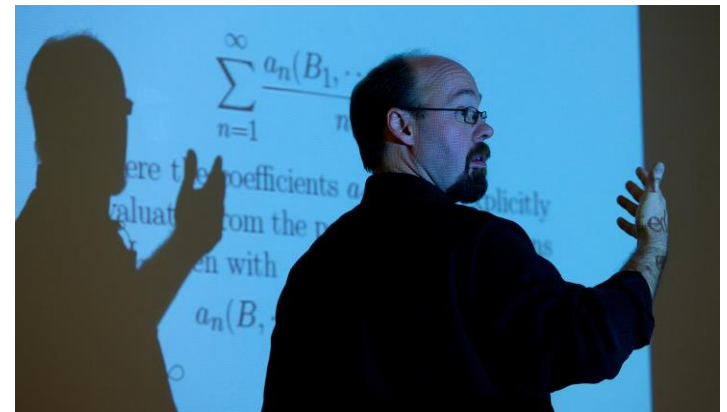
Phase II

- Admission with a master's degree (or equivalent)
- Usually 4 - 6 semesters
- Thesis work, integrated in research group
- One Advanced Course per semester
- Thesis advisor and separate mentor
- BMS Fridays



BMS Fridays

- Distinguished guest speakers, e.g. Erickson, Martini, Wendland, Kumagai, etc.
- Kovalevskaya Colloquia with “Kovalevskaya Lunch”
- Tea & cookies before every Friday lecture
- Student-run “What is...?” Seminar



Soft-Skills Seminars

- Intercultural training: Germany for the newcomer and for the experienced
- Time and self-management during the doctorate
- Communication, conflict management, negotiation
- Teaching/writing mathematics
- Planning your career path
- etc.

BMS Support

Scholarships

- Around 50% of Phase I students are awarded a BMS scholarship
- All Phase II students are offered financial support (25% from BMS, 75% from other sources)

Financial support also for

- Conferences and summer schools
 - once during Phase I
 - once a year during Phase II
- German language courses

Questions?

Contact:

BMS One-Stop Office

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www.math-berlin.de