Berlin Mathematical School

a joint project of

BMS . . .

- a graduate school in mathematics
- leads students to a PhD
- founded in Summer 2006
- funded by “Excellence Initiative”
- based on broad expertise in mathematics in Berlin

BMS offers ...

- structured Ph.D. program taught in English
- joint Friday colloquia with distinguished guest speakers
- soft skills training
- mentoring for all students
- etc.

BMS offers ...

- first-rate graduate studies environment
- access to research groups at three universities
- access to the program and scholarships of

  4 DFG Research Training Groups and

  2 International Max Planck Research Schools

  ...

BMS aims to have...

Berlin Mathematical School

- 50% female students
- 50% foreign students
- an incoming cohort of 40 in each Phase starting 2008/09

BMS Scholarships

Berlin Mathematical School

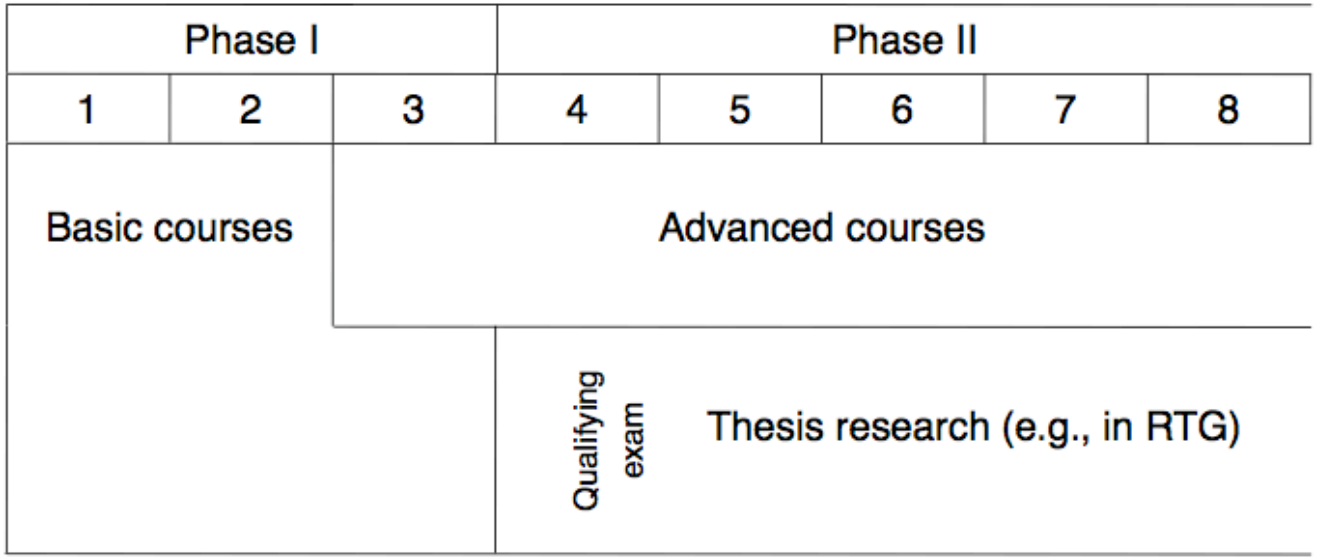
- Phase I
  - 800 €/month for 18 months
  - for 50% of incoming cohort
- Phase II
  - 1350€/month for 24 months
  - for 25% of incoming cohort
- Other types of funding available for Phase II, e.g. RTGs
- Extra funding for student parents (150€/month)

BMS Research Areas

1. Analysis, geometry, and mathematical physics
2. Algebraic and arithmetic geometry, number theory
3. Probability, statistics, and financial mathematics
4. Discrete mathematics and optimization
5. Visualization and geometric processing
6. Numerical mathematics and scientific computing
7. Mathematical modeling and applied analysis

Set-Up: Study Program

Berlin Mathematical School



Study Program for Phase I

Berlin Mathematical School

- Entrance level: Bachelor‘s degree
- Usually three semesters
- At least five basic courses
- At least two advanced courses, including a seminar course
- BMS colloquium/seminar on Fridays
- End with qualifying exam to enter Phase II

BMS Basic Courses

Berlin Mathematical School

[1] *Differential geometry, global analysis, and topology*
- Analysis and geometry on manifolds
- Surface theory

[2] *Algebra and number theory, algebraic and arithmetic geometry*
- Commutative algebra
- Algebraic geometry

[3] *Probability theory and financial mathematics*
- Stochastic processes I: Discrete time
- Stochastic processes II: Continuous time

[4] *Discrete mathematics and discrete geometry*
- Combinatorics
- Geometry

BMS Basic Courses

Berlin Mathematical School

[5] *Linear, nonlinear, and combinatorial optimization*

- Linear and integer programming
- Nonlinear optimization

[6] *Numerical analysis, scientific computing, and visualization*

- Numerical methods for ODEs and numerical linear algebra
- Numerical methods for PDEs

[7] *Applied analysis, mathematical physics, and dynamical systems*

- Dynamical systems
- Partial differential equations

Additional courses

- Complex analysis
- Functional analysis
- Topology

Study Program for Phase II

Berlin Mathematical School

- Entrance level: Qualifying exam or Master's degree
- Thesis advisor and separate mentor
- Four to six semesters
- Thesis work, integrated in research group
- One advanced course per semester
- BMS Fridays

BMS Advanced Courses

Berlin Mathematical School

[1] *Differential geometry, global analysis, and topology*

- Global concepts in geometry (Baum, Ecker, Friedrich, Huisken, Schüth)
- Special Topics in geometric analysis (Ecker, Huisken)
- Differential geometry and integrable systems (Bobenko, Pinkall)
- Knot theory (Sullivan)
- Gauge field theory, spin geometry, and Dirac operators (Baum, Friedrich)
- Spectral and index theory of geometric operators (Brüning, Schüth)
- Lie groups and Lie algebras (Baum, Friedrich, Schüth)
- Symplectic geometry and topology (Mohnke)

Seminars and Colloquia

Berlin Mathematical School

[1] *Differential geometry, global analysis, and topology*

- Colloquium of the Collaborative Research Center
  "Space, Time, Matter" (HU, FU, AEI)
- Seminar of the DFG Research Group
  "Polyhedral Surfaces" (TU)
- Oberseminar
  "Differential geometry" (TU)
- Research seminar
  "Differential geometry and global analysis" (HU)
- Research seminar
  "Analysis, geometry, and physics" (FU)
- Seminar of the International RTG
  "Arithmetic and Geometry" (HU)

Phase I and II yield the BMS

Berlin Mathematical School

Phase I			Phase II				
1	2	3	4	5	6	7	8

Study program for Phase I:

- Entrance level: Bachelor
- Usually three semesters
- At least five basic courses
- At least two advanced courses, including a seminar course
- BMS colloquium/seminar on Fridays

Study program for Phase II:

- Entrance level: Qualifying exam or masters/diploma
- Thesis advisor and separate mentor
- Four to six semesters
- Thesis work, integrated in research group
- One advanced course per semester
- BMS Fridays

BMS Fridays

Berlin Mathematical School

- BMS colloquium, including
  - *Sonia Kovalevskaya Colloquia*
  - *Mathematics as a Whole* lectures
- BMS surveys seminar
- Special activities, “soft skills” training seminars
  - on writing
  - on speaking
  - on reviewing
  - . . .
- Tea

BMS Website

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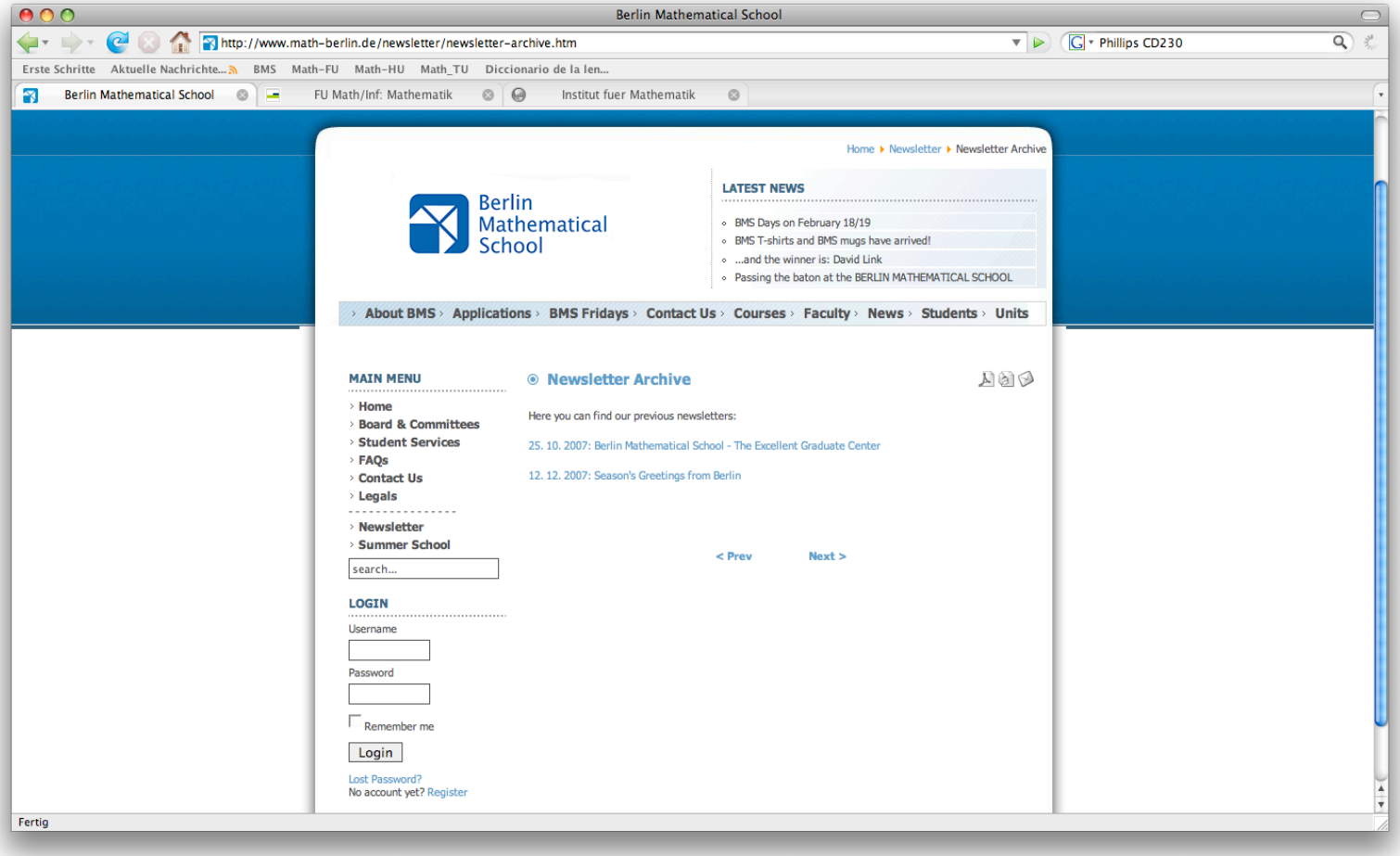

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Thank you for your attention!

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