

# Swiss Doctoral Program in Mathematics

Universities of Basel, Bern, Fribourg, Geneva, Neuchâtel, and EPF Lausanne

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## Annual Report Academic Year 2010/11

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This report contains information on the **Swiss Doctoral Program in Mathematics**. It covers the period of the academic year 2010/11, with a preview of the following academic year. To benefit from the hyperlinks, please use the online version on [www.math.ch/dp](http://www.math.ch/dp).

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## Welcome

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Under the label **Swiss Doctoral Program in Mathematics** the departments and institutes of mathematics at the Universities of [Basel](#), [Bern](#), [Fribourg](#), [Geneva](#) and [Neuchâtel](#), and [EPF Lausanne](#) offer a joint program for doctoral students in mathematics. The program is open to all doctoral students at the mentioned universities and aims to provide a comprehensive spectrum of research and training activities.

By completing the *Swiss Doctoral Program in Mathematics* doctoral students will be provided, in addition to the doctoral degree from the participating university, with a **certificate** of the *Doctoral Program*.

The graduate students are attached to the universities where they are enrolled. In particular, master's and doctoral degrees are issued by the participating universities and are outside the competence of the *Doctoral Program*.

The *Swiss Doctoral Program in Mathematics* consists of participating faculty, graduate students enrolled in the *Doctoral Program*, and post-docs. Participation is voluntary. The *Doctoral Program* permits doctoral students to validate their engagement and to profit from the offers and benefits of the program.

The *Swiss Doctoral Program in Mathematics* was founded in 2006. In a pilot phase till 2008 it was running together with the pre-existing [Ecole doctorale de mathématiques Genève - Neuchâtel](#). In 2009, the *Swiss Doctoral Program in Mathematics* had a common budget with the *Troisième cycle Romand de mathématiques* and was fully supported by the [CUSO](#).

On January 1, 2010, the *Doctoral Program* merged with the *Troisième cycle Romand de mathématiques* and runs now under the official label **Programme doctoral en mathématiques de la CUSO**. Please see the [archive](#) for the history of the *Troisième cycle*.

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## Objectives

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The aim of the *Swiss Doctoral Program in Mathematics* is to offer an advanced research training in mathematics of high quality and to prepare doctoral students for their future career.

The *Doctoral Program* provides a broad platform for contacts among the mathematical research groups in Switzerland. The synergistic effect initiated by the joint activities represents a major added value complementing the research activities of the participating universities.

The *Swiss Doctoral Program in Mathematics* covers the three following parts:

**Education towards research:** In a joint effort of the participating research groups at the departments of mathematics at the involved universities the *Doctoral Program* offers an intensive and broad graduate education in mathematics of international format. The program consists of a wide range of graduate courses and research seminars, summer and winter schools. Moreover, special programs are launched that include block-courses given by internationally recognized speakers, and sequences of lectures focusing on recent developments. The program comprises both, activities that provide a good general mathematical background and specialized topics which are related to the research interests of groups of doctoral students. The learning outcome of the doctoral program is the ability to do independent original research in mathematics.

**Information:** The *Doctoral Program* offers a platform of information about research activities, conferences, the mathematical community, and exchange programs. It also provides information about job opportunities and continuing education.

**Career management:** The *Doctoral Program* addresses the issue of the professional integration of doctoral students. It serves as a platform to establish contacts with doctoral students of other research groups in Switzerland and offers a challenging and stimulating atmosphere so as to provide young researchers with an excellent base for a professional or research career in mathematics. The offer includes the program of [Transferable skills](#) of the CUSO.

**Support:** The *Doctoral Program* can provide some partial support to doctoral students who participate (actively) in conferences or other scientific activities abroad. The support is limited and subject to the following conditions:

1. The applicant must be registered as a PhD student in mathematics in one of the member universities.
2. The student should give a short description of the conference and his/her motivations for attending.
3. He/she should ask in parallel for some financial support from his advisor and/or institute.
4. He/she should also ask for some support from the organizers of the

conference.

5. A budget should be presented.

The request must be approved by the PhD advisor and a local [senior member of the council](#) and sent to the [Vice-Director](#).

# **Swiss Doctoral Program in Mathematics**

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## **Neighboring Schools**

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The *Swiss Doctoral Program in Mathematics* collaborates with

- [The Zurich Graduate School in Mathematics](#)
- [Ecole doctorale de l'EPFL](#)

**Reciprocity agreement between the Zurich Graduate School in Mathematics and the Swiss Doctoral Program in Mathematics:** PhD Students which are enrolled in either school are entitled to participate in activities of the other school. A request for reimbursement of travel or other costs can only be filed with the own school according to its rules.

A similar agreement with the *Ecole doctorale de l'EPFL* is currently under negotiation.

# Swiss Doctoral Program in Mathematics

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## Spectrum of Activities

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The *Doctoral Program*

- offers courses in all areas of mathematics at graduate and research level,
- organizes workshops and block-courses in which experts present advanced topics and work with the doctoral students,
- organizes workshops and seminars where the doctoral students present in an accessible way the context and the progress of their own research in a talk or by a poster,
- encourages doctoral students to participate actively in international conferences,
- proposes complementary training in scientific English, computer science, scientific writing and presentation technique,
- prepares and stimulates the transition of the doctoral students to the professional life in industry, administration or in academia,
- sets up a network of information relevant to doctoral students for succeeding in their thesis and in their career planning.

Activities of the *Doctoral Program* include the following events primarily targeted at the graduate student audience:

- **Graduate courses:** in general, these are special courses at the graduate level given over the period of one semester, or more concentrated courses having around 20 teaching hours. Graduate courses have a flexible format: they can be given by one or several teachers, and they can be offered once a week or they can be organized in intensive modules dispatched over one-week periods.
- **Summer/Winter Programs:** these are one-week events which bring together graduate students and leading experts in their respective fields. Typically, the invited speakers present several mini-courses, and there is a possibility for informal discussions with graduate students.
- **Graduate Colloquium:** this is an opportunity for graduate students to present their own work in front of a friendly audience. Such events can be organized in particular topics, as well as at the interdisciplinary level (between different fields of mathematics).
- **Other Events** can be organized at the request of the members of the *Doctoral Program*, if the committee finds them suitable.

Every year, the *Doctoral Program* organizes a [list of events](#) where doctoral students are encouraged to participate and to [earn credits](#). Each event is assigned a certain number of credits depending on its length and content.

Below we list more particular targets of the *Doctoral Program* which are not currently covered by the *3e Cycle Romand*:

- To offer a choice of advanced graduate courses in various fields of mathematics (similar to American graduate schools). These courses will be addressed to graduate students in the beginning of their studies. The

main purpose is to provide an up to date background in the major fields of mathematics to the graduate students participating in the *Doctoral Program*.

- To organize two-day meetings within the Graduate Colloquium. These meetings will give an opportunity to doctoral students to present their research area to other doctoral students and their results to experts in the respective fields.
- To organize Summer/Winter Schools in case the offer of such schools is not sufficient. The topic can vary and it will be chosen according to the research topics of graduate students participating in the *Doctoral Program*.

On a smaller scale, the *Doctoral Program* addresses the issues of marketing of scientific research and of the professional integration of doctoral students. In particular, the following issues should be touched upon in the format of lectures or workshops:

- How to write articles in mathematics (what is an introduction, how to compose the bibliography etc.)?
- How to make a presentation (in particular, in English)?
- How to use a computer in mathematical research?
- How to write a CV, and how to prepare a job interview?

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## Responsibilities

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The activities of the *Doctoral Program* are planned by the **Council** and directed by the **Committee**. The **Secretary** takes care of the accounting and registers the students achievements.

The *Council* is composed of **two faculty members** and **one PhD student (plus a substitute)** from each university participating in the *Doctoral Program*. The Director of the *Ecole doctorale de l'EPFL* is a permanent invitee in the *Council*.

The responsibilities of the *Council* are as follows:

- To plan activities of the *Doctoral Program* and to coordinate the activities with other graduate schools. The program of activities is prepared and announced for each academic year.
- To elect the *Committee* among its members.

The *Council* can delegate part of its responsibilities to the *Committee* who runs the activities of the *Doctoral Program* in the periods between the meetings of the *Council*.

The *Committee* is composed of a **Director**, a **Vice Director**, and a **PhD student**. The Directors are faculty members.

The responsibilities of the *Committee* are as follows:

- To distribute the budget of the *Doctoral Program* between different activities.
- To approve applications of graduate students for entering the *Doctoral Program* and for participation in various activities.
- To assign credits to graduate students for successful participation in the activities of the *Doctoral Program* or in other activities in mathematics at the graduate level.

Faculty members of participating institutions are entitled and invited to [submit proposals](#) to the *Doctoral Program Committee*.

# Swiss Doctoral Program in Mathematics

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## Committee

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### Director

[Bruno Colbois](#)

Institut de Mathématiques  
Université de Neuchâtel  
Rue Emile Argand 11  
Case postale 158  
CH-2009 Neuchâtel (Switzerland)  
Phone ++41 (0)32 718 28 08  
Fax ++41 (0)32 718 28 01  
e-mail [bruno.colbois@unine.ch](mailto:bruno.colbois@unine.ch)



### Vice Director

[Marc Troyanov](#)

IGAT-Institut de Géométrie, d'Algèbre et de Topologie  
Bâtiment BCH  
EPFL  
CH-1015 Lausanne (Switzerland)  
Phone ++41 (0)21 693 54 21  
Fax ++41 (0)21 693 03 85  
e-mail [marc.troyanov@epfl.ch](mailto:marc.troyanov@epfl.ch)



### PhD Student Representative

[Lev Kiwi](#)

Department of Mathematics  
University of Fribourg  
Chemin du Musée 23  
CH-1700 Fribourg (Switzerland)  
Phone ++41 (0)26 300 92 03  
Fax ++41 (0)26 300 97 44  
e-mail [lev.kiwi@unifr.ch](mailto:lev.kiwi@unifr.ch)



## Former Directors

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- 2006-2010: [Norbert Hungerbühler](#) (founding director)

# Swiss Doctoral Program in Mathematics

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## Senior Council Members

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University	Council Members	
Basel	Hanspeter Kraft	Jérémy Blanc
Bern	Sebastian Baader	George Metcalfe
Fribourg	Anand Dessai	Ruth Kellerhals
Geneva	Anton Alekseev	Andras Szenes
Neuchâtel	Bruno Colbois*	Alain Valette
EPF Lausanne	Eva Bayer	Marc Troyanov**
Ecole doctoral EPFL	Friedrich Eisenbrand***	

\*Director and \*\*Vice Director of the *Doctoral Program*

\*\*\*Director of the *Ecole doctorale de l'EPFL* (permanent invitee)

## Junior Council Members

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University	Council Member	Substitute
Basel	Immanuel Stampfli	NN
Bern	Claudio Somaini	NN
Fribourg	Florence Yerly	Chrystel Feller
Geneva	David Albertani	NN
Neuchâtel	Bastien Marmet	NN
EPF Lausanne	Caroline Lassueur	Laura Vinckenbosh Daniel Arnold Moldovan

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## Secretary

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Our Secretary takes care of the accounting and registers the students achievements.

### Accounting

[Claudia Kolly](#)

Université de Fribourg, Péroilles  
Département de mathématiques  
Chemin du Musée 23

CH-1700 Fribourg (Switzerland)

Phone ++41 (0)26 300 91 79

Fax ++41 (0)26 300 97 44

e-mail [claudia.kolly@unifr.ch](mailto:claudia.kolly@unifr.ch)



# **Swiss Doctoral Program in Mathematics**

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## **Enrollment: General**

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The participation in the *Doctoral Program* is voluntary for both, faculty and doctoral students. However it is recommended. All doctoral students of the participating universities and all faculty members and post-docs have access to the activities of the *Doctoral Program* and are invited to participate actively. Enrolled doctoral students are entitled to [apply for refund of costs](#) for the successful participation in activities of the *Doctoral Program* and for travel grants (see [Support](#)).

Enrollment of a doctoral student in the *Doctoral Program* ends with the conferral of the doctorate and is limited to five years. Participating doctoral students are usually employed as assistants at one of the affiliated universities or hold a scholarship of the National Science Foundation or of other sources.

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## Scoring

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The participation of a doctoral student in the *Doctoral Program* is validated by ECTS points. A doctoral student must acquire a minimum of **30 ECTS points** to be entitled to receive the certificate of the *Doctoral Program*. A doctoral student can earn credit points as follows:

1. By following and validating a course which is approved by the *Doctoral Program* (3 ECTS points)
2. By participating and validating a workshop, block-course or conference approved by the *Doctoral Program* (3 ECTS points)
3. By presenting the context and the progress of the own research within the framework of a colloquium (3 ECTS points)
4. By presenting a scientific topic different from the own research within the framework of a colloquium (3 ECTS points)
5. By participating in a complementary training in scientific English, computer science, scientific writing or presentation technique, or by organizing a scientific activity within the framework of the *Doctoral Program* (1 ECTS = 25 hours of work)
6. For a doctoral student working as an assistant, a maximum of 6 ECTS points can be obtained by fulfilling his teaching obligations. This maximum corresponds to the teaching load of a half-time assistant during four years.

A minimum of 9 ECTS points must be acquired in the first category, and at least 6 ECTS points in each of the categories 2 and 3.

Each doctoral student is guided by an advisor, usually a professor of one of the affiliated universities. Of course, *thèses en co-tutelle* and co-direction of a thesis is possible. The doctoral student develops a research activity and is supposed to obtain results that lead to the granting of a doctorate at the respective university.

# Swiss Doctoral Program in Mathematics

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## Application of Students

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A PhD student in mathematics at one of the affiliated universities can enroll for the *Doctoral Program* by filling the following form. A confirmation is sent by e-mail to the applicant and his or her thesis advisor.

<input type="text"/>	Name *
<input type="text"/>	First name *
<input type="text"/>	University *
<input type="text"/>	E-Mail *
<input type="text"/>	Homepage
<input type="text"/>	Thesis advisor *
<input type="text"/>	E-Mail of thesis advisor *
$e^{i\pi} + 1 =$ <input type="text"/>	please enter the result to prove that you are not a robot.
<input type="submit" value="Submit"/>	

\* = required fields

# Swiss Doctoral Program in Mathematics

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## Registration research groups

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Professors and lecturers of the affiliated universities can register with the *Swiss Doctoral Program in Mathematics*. By doing so, your name, research group and area will be listed on the [member's page](#) of the *Doctoral Program*. This promotes your research and makes your group attractive for young PhD students, and you express your support to the *Doctoral Program*. A confirmation of your registration is sent by e-mail.

<input type="text"/>	Name *
<input type="text"/>	First name *
<input type="text"/>	University *
<input type="text"/>	E-Mail *
<input type="text"/>	Homepage
<input type="text"/>	Research field(s) *
$e^{i\pi} + 1 =$ <input type="text"/> please enter the result to prove that you are not a robot.	
<input type="submit" value="Submit"/>	

\* = required fields

# Swiss Doctoral Program in Mathematics

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## Validation

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Doctoral students who are registered with the *Swiss Doctoral Program in Mathematics* can validate an activity by sending the validation form to the [Secretary](#) of the program.

Download the [validation form](#).

To earn the credits one needs to satisfy certain criteria, e.g. to pass a test/exam for graduate courses, to give a talk at the Graduate Colloquium, or to take an active part in a Summer/Winter School etc. Upon prior request, the [Director](#) of the *Doctoral Program* can accept credits earned in the activities organised by [other graduate schools in mathematics](#) or other institutions.

Upon reception and verification of the form, the ECTS points associated with the activity are credited to the student's account.

Please attach the [reimbursement form](#) in case you apply for refund of costs. And please keep a copy of the form with your records.

# Swiss Doctoral Program in Mathematics

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## Validation Form

I have participated in the following activity of the *Doctoral Program*:

Title: .....

.....

Date: .....

My name: .....

Course instructor: .....

I would like to credit the ECTS points associated with this activity for the following category (see below for the list of categories).

1

2

3

4

5

6

## Signatures

PhD student: .....

Course instructor: .....

Thesis advisor: .....

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**Scoring rules:** The participation of a doctoral student in the *Doctoral Program* is validated by ECTS points. A doctoral student must acquire a minimum of 30 ECTS points to be entitled to receive the certificate of the *Doctoral Program*. A doctoral student can earn credit points as follows:

1. By following and validating a course which is approved by the *Doctoral Program* (3 ECTS points).
2. By participating and validating a workshop, block-course or conference approved by the *Doctoral Program* (3 ECTS points),
3. By presenting the context and the progress of the own research within the framework of a colloquium (3 ECTS points).
4. By presenting a scientific topic different from the own research within the framework of a colloquium (3 ECTS points).
5. By participating in a complementary training in scientific English, computer science, scientific writing or presentation technique, or by organizing a scientific activity within the framework of the *Doctoral Program* (1 ECTS point = 25 hours of work).
6. For a doctoral student working as an assistant, a maximum of 6 ECTS points can be obtained by fulfilling his or her teaching obligations. This maximum corresponds to the teaching load of a half-time assistant during four years.

A minimum of 9 ECTS points must be acquired in the first category, and at least 6 ECTS points in each of the categories 2 and 3.

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Please send this form to the Secretary of the program: [www.math.ch/dp/committee/doctoral-students](http://www.math.ch/dp/committee/doctoral-students)

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## Reimbursement

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Doctoral students who are registered with the *Swiss Doctoral Program in Mathematics* can apply for reimbursement of travel costs connected to the participation and [validation](#) of an activity of the *Doctoral Program* by sending the reimbursement form to the [Secretary](#) of the program.

Please send the form, including original receipts, before December 10th of each year. Download the [reimbursement form](#) (only valid if attached to the [validation form](#) for the same activity).

Consider the following guidelines:

- [Guidelines for reimbursement](#)
- [Summary of the management directive of the CUSO](#)

Please observe that for validation and reimbursement of external activities which are not listed on the program of the *Swiss Doctoral Program in Mathematics* the procedure for [Support](#) applies.

# ORDRE DE REMBOURSEMENT DE FRAIS À UN-E PARTICIPANT-E <sup>1)</sup>

3<sup>e</sup> cycle/programme doctoral : \_\_\_\_\_

Année : \_\_\_\_\_ Projet n° : \_\_\_\_\_

Intitulé : \_\_\_\_\_

Lieu de l'activité : \_\_\_\_\_

Dates : du \_\_\_\_\_ au \_\_\_\_\_

Participant-e :

Nom : \_\_\_\_\_

Prénom : \_\_\_\_\_

Adresse : \_\_\_\_\_

Institution d'attache : \_\_\_\_\_

Statut : \_\_\_\_\_  
(professeur-e, assistant-e, étudiant-e, etc.)

Date	Trajet	Prix du déplacement <sup>2)</sup>	Frais de repas ou séjour <sup>3)</sup>	TOTAL (CHF)	Visa de l'enseignant-e
<b>TOTAL</b>					

**VERSEMENT POUR :**

Nom, Prénom \_\_\_\_\_

Compte postal IBAN n° \_\_\_\_\_

Banque en CH, nom et lieu \_\_\_\_\_

IBAN n° \_\_\_\_\_

Date : \_\_\_\_\_ Signature du/de la participant-e : \_\_\_\_\_

Visa du/de la président-e : \_\_\_\_\_

1) Les frais de participation ne peuvent être remboursés qu'à des membres d'une haute école ou institution partenaire pour la discipline (v. directives de gestion)

2) Déplacement selon 1/2 tarif CFF 2<sup>e</sup> classe

3) Repas seul : maximum CHF 25.- (joindre justificatifs)  
Séjour + repas : maximum CHF 120.- par jour, pension complète (joindre justificatifs)

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## Reporting

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The progress of graduate students within the *Doctoral Program* is evaluated each year by the *Doctoral Program Committee* or the *Director* on the basis of the credits obtained by doctoral students. The *Doctoral Program* works in close contact with the thesis advisors of the graduate students. In particular, the progress evaluation is communicated to the thesis advisors.

Doctoral students submit **yearly a report** documenting their activities related to the *Doctoral Program*. They can include a summary of their research results. The report is to be sent at the end of the academic year to the [Director](#) of the program.

Upon conferral of your doctorate please send a notice to the same address with your postal address. You will then receive your **certificate** of the *Doctoral Program*.

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## Program of the academic year 2010/2011

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Link to the program of the academic year [2006/2007](#), [2007/2008](#), [2008/2009](#), [2009/2010](#).

Please consider also the program [Transferable skills](#) of the CUSO, and [StartingDoc](#).

### COLOR CODE GUIDE

Recommended for all doctoral students

Recommended for all doctoral students working in the field

Recommended for advanced doctoral students working in the field

### Graduate Course of the III Cycle: [Autour des problèmes de Linnik](#)

Prof. [Philippe Michel](#) (EPFL)

Fall term 2010, Wednesdays, 11:15 - 12:30, beginning: September 22.

Place: EPFL, room [ODY 0 16](#)

### Graduate Course of the III Cycle: [Homologie de Floer et applications](#)

Prof. [Felix Schlenk](#) (Neuchâtel)

Fall term 2010, Wednesdays, 14:15 - 15:30, beginning: September 22.

Place: EPFL, room [GR A3 31](#)

### Graduate Course of the III Cycle: [Introduction to complex analysis in several variables](#)

Prof. [Frank Kutzschebauch](#) (Bern)

Fall term 2010, Wednesdays, 15:45 - 17:00, beginning: September 22.

Place: EPFL, room [GR A3 31](#)

### Course: [Excursion with the free loop-space](#)

Prof. Gregory Lupton (Cleveland State University)

Fall term 2010, Mondays, 10:15 - 11:45 and 14:15 - 15:45, beginning: November 8.

Place: EPFL, room [MA 12](#) (a.m.) and [MA 10](#) (p.m.)

Informations: [K. Hess](#) (EPFL)

### [Optimal transport, Ricci curvature and application to probability](#)

Erwan Hillion (Neuchâtel)

Tuesday November 9, 16 and 30, 2010, from 10:30 to 13:30 (with a break at the middle!)

Place: Neuchâtel, Institute of Mathematics, Auditorium B 217

### Seminar: **Geometry and Dynamics in Negative Curvature**

Last talks of the seminar:

Gilles Courtois: Uniform growth of groups acting on Cartan-Hadamard spaces I,II  
Neuchâtel, 18.11.2010 at 13.30 and 19.11.2010 at 16.30, B 217.

Marc Peigné : Exposant critique et série de Poincaré I,II  
Neuchâtel, 25.11.2010 at 13.30 and 16.15, B 217.

Organization: [Bruno Colbois](#), [Felix Schlenk](#) (Neuchâtel)

### Mini-course on Game Theory: **announcement, abstract**

Prof. Jörgen Weibull (Stockholm School of Economics)

January 24, 2011, from 13.30 till 15.30 (slides: [lecture 1](#))

January 26, 2011, from 10.00 till 12.00 (slides: [lecture 2A](#), [lecture 2B](#))

Place: Neuchâtel, Faculty of Sciences, Rue E Argand 11, Room B. 013

### **Birational geometry (intensive lecture)**

Les Diablerets, January 24-28, 2011

Informations: [J. Blanc](#) (Basel)

### **Regards croisés sur les actions de groupes en géométrie**

Neuchâtel, February 7-9, 2011

Place: Neuchâtel, Institute of Mathematics, building B, 2nd floor, [map](#)  
[List of participants](#)

Informations: [B. Colbois](#) (Neuchâtel)

### **Seventh Graduate Colloquium**

Lausanne, February 17-18, 2011

Place: EPFL, room [MA 30](#)

Organization: [Caroline Lassueur](#) and [Daniel Moldovan](#)

### **Journée Georges de Rham**

Lausanne, March 9, 2011

Speakers: Mikhail Kapranov (Yale University); Don Zagier (MPI Bonn & Collège de France)

Place: EPFL, room [CM 1](#)

Organization: [A. Karlsson](#) (Geneva)

### **Advanced course: Groups, languages and automata**

Prof. Sarah REES (Newcastle)

2011, March 11, 17, 18, 31; April 1st, 7, 8; each time from 2PM to 4PM

Neuchâtel, Institut de Mathématiques, UniMail, 11 Rue Emile Argand, Room B217

### **Journée de printemps de la SMS: Algebra & Coalgebra Meet Proof Theory**

Introductory lectures for doctoral students on April 27

Bern, April 27-29, 2011

Informations: [G. Metcalfe](#) (Bern)

### **Second Workshop on CR, Pseudo-Hermitian and Sasaki Geometry**

Introductory lectures for doctoral students on Mai 3

Neuchâtel, Mai 3-5, 2011

Informations: [M-A. Lawn](#) (Neuchâtel)

### **Memorial Michel André**

Introductory lectures for doctoral students on Mai 11 and 12

EPFL, Mai 11-15, 2011

Informations: [K. Hess](#) (EPFL)

### **Séminaire Kervaire: Mathematical Theory of Quantum Networks**

Les Diablerets, June 6-10, 2011

Informations: [C. Tretter](#) (Bern)

### **Young Topologists Meeting 2011**

EPFL, June 14-18, 2011

Organization: [Eric Finster](#), [Varvara Karpova](#) and [Marc Stephan](#)

### **Séminaire Borel: Topics in Real and Complex Hyperbolic Geometry**

Les Diablerets, August 22-26, 2011

Informations: [R. Kellerhals](#) (Fribourg)

### **Eighth Graduate Colloquium**

Basel, September 8-9, 2011

Place: Basel, [Mathematisches Institut](#)

Organization: [Christian Graf](#) and [Immanuel Stampfli](#)

### **Graduate Course of the III Cycle: Metric embeddings in Hilbert and Banach spaces**

Prof. [Alain Valette](#) (Neuchâtel)

Fall term 2011, Wednesdays, 11:15 - 12:30, beginning: September 21

Place: EPFL, room [CM 013](#)

**Graduate Course of the III Cycle: [Train Tracks, Thurston and Teichmueller Theory](#)**

Prof. [Sebastian Baader](#) (Bern)

Fall term 2011, Wednesdays, 14:00 - 15:15, beginning: September 21

Place: EPFL, room [MA 10](#)

**Graduate Course of the III Cycle: [Floer homology with applications II](#)**

Prof. [Felix Schlenck](#) (Neuchâtel)

Fall term 2011, Wednesdays, 15:45 - 17:00, beginning: September 21

Place: EPFL, room [MA 10](#)

# Swiss Doctoral Program in Mathematics

Universities of Basel, Bern, Fribourg, Geneva, Neuchâtel, and EPF Lausanne

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## Journée Georges de Rham

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The *Journée Georges de Rham* has been introduced in 1991 by the *Troisième cycle Romand de mathématiques* and usually takes place at EPF Lausanne. It convenes mathematicians not only of the CUSO universities, but also from the whole of Switzerland and from abroad and stimulates interaction between professors, postdocs and PhD students. The organisers invite two speakers of international reputation who present their vision of contemporary mathematics and of future developments. A particular aim is to offer doctoral students a modern high class perspective of mathematical sciences and to establish contacts on an international level and with other research groups.

- 2011 Mikhail Kapranov** (Yale University)  
*Formal loops and chiral differential operators*  
**Don Zagier** (MPI Bonn & Collège de France)  
*From mock theta functions to black holes*
- 2010 Luigi Ambrosio** (Scuola Normale Superiore di Pisa)  
*Surface measures in Euclidean spaces, Carnot groups and Wiener space*  
**Alexander Bobenko** (Technische Universität Berlin)  
*Discrete Differential Geometry: Theory and Applications*
- 2009 Curtis McMullen** (Harvard University)  
*Billiards and moduli space*  
**Peter Sarnak** (Princeton University)  
*The affine linear sieve*
- 2008 Jean-Christophe Yoccoz** (Collège de France)  
*Dynamique et Géométrie des échanges d'intervalles*  
**Gang Tian** (Princeton University)  
*Geometry and Analysis of low dimensional Manifolds*
- 2007 László Lovász** (Microsoft research USA)  
*The limit of a growing graph sequence*  
**Benoît Mandelbrot** (Yale, USA)  
*Fractales et multifractales : survol et quelques résultats récents*
- 2006 Jean-Pierre Serre** (Collège de France)  
*Le "nombre de points mod  $m$ " d'une variété algébrique*  
**Akshay Venkatesh** (MIT)  
 *$p$ -adic dynamics and representations by quadratic forms*
- 2005 Morris Hirsch** (UC Berkeley)  
*Actions of Lie algebras and Lie groups on surfaces*  
**Benjamin Weiss** (University of Jerusalem)  
*Recent developments in the ergodic theory of amenable group actions*
- 2004 Marcus du Sautoy** (Oxford)  
*Through the looking glass: groups from a number theoretic*

- perspective*  
**Robert Ghrist** (Urbana-Champaign)  
*Knotted Flowlines*
- 2003 **Martin R. Bridson** (Imperial College London)  
*The geometry of the word problem*  
**Marcel Berger** (IHES)  
*Dynamiser la géométrie élémentaire : introduction aux travaux de Richard Schwartz*
- 2002 **Valentin Poénaru** (Université Paris-Sud, Orsay)  
*Problèmes de Topologie en petite dimension*  
**John Milnor** (SUNY at Stony Brook)  
*Is there a science of complexity?*
- 2001 **Antonio Ambrosetti** (SISSA, Trieste)  
*Perturbation in critical point theory and applications to nonlinear differential equations*  
**Stuart Antman** (University of Maryland at College Park)  
*Analytic consequences of incompressibility in mechanics*
- 2000 **Jean Bellissard** (Université Paul Sabatier, Toulouse)  
*La géométrie non commutative des solides apériodiques*  
**Etienne Ghys** (Ecole Normale Supérieure, Lyon)  
*La structure des feuilletages holomorphes*
- 1999 **Jürg Fröhlich** (ETH Zürich)  
*Supersymmetry and Differential Geometry*  
**Daniel Sternheimer** (Université de Dijon)  
*La cohomologie de de Rham des variétés symplectiques : un classifiant des quantifications*
- 1998 **Dieter Kotschick** (Universität München)  
*Signatures, monopoles and mapping class groups*  
**Michel Brion** (Université de Grenoble I)  
*Formule sommatoire d'Euler MacLaurin pour les polytopes convexes rationnels*
- 1997 **Shahar Mozes** (Hebrew University)  
*Products of trees, lattices and simple groups*  
**Gilles Pisier** (Texas A&M University)  
*Problèmes de similarité et applications complètement bornées*
- 1996 **Rémi Langevin** (Université de Bourgogne)  
*Géométrie intégrale*  
**Ian Hambleton** (McMaster University)  
*Topological equivalence of linear representations*
- 1994 **Michèle Audin** (Université de Strasbourg)  
*Matrice de Jacobi*  
**Jean-Benoit Bost** (IHES)  
*Courants de Green et géométrie arithmétique*
- 1993 **Jean-Pierre Demailly** (Grenoble)  
*Méthodes analytiques récentes et géométrie algébrique*  
**Vaughan Jones** (Berkeley and Geneva)  
*Groupes de lacets et algèbres d'opérateurs*
- 1992 **Jacques Tits** (Collège de France)

**Peter Hilton** (Binghamton University)

1991 **Alain Connes** (IHES, Paris)

*La notion d'espace géométrique et le modèle standard*

**Raoul Bott** (Harvard)

*Aspects of torsion: old and new*

# **Swiss Doctoral Program in Mathematics**

*Universities of Basel, Bern, Fribourg, Geneva, Neuchâtel, and EPF Lausanne*

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## **Recommended external Activities**

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- [Zurich Graduate School in Mathematics](#)
- [Ecole doctorale de l'EPFL](#)

# Swiss Doctoral Program in Mathematics

Universities of Basel, Bern, Fribourg, Geneva, Neuchâtel, and EPF Lausanne

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## Advanced Courses 2010/11

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Specific courses which are held in the framework of a master program are also qualified for PhD students. Such courses can be announced on this page using the usual [form](#) and are thereby open for all PhD students participating in the Doctoral Program. In order to minimize travelling, it is recommended to organize such courses in a bi-weekly rhythm or as block courses.

Link to the advanced courses of the academic year [2006/2007](#), [2007/2008](#), [2008/2009](#), [2009/2010](#).

<b>Graduate Course of the III Cycle: <a href="#">Autour des problèmes de Linnik</a></b>
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Prof. <a href="#">Philippe Michel</a> (EPFL)
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Fall term 2010, Wednesdays, 11:15 - 12:30, beginning: September 22.
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Place: EPFL, room <a href="#">ODY 0 16</a>
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<b>Graduate Course of the III Cycle: <a href="#">Homologie de Floer et applications</a></b>
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Prof. <a href="#">Felix Schlenk</a> (Neuchâtel)
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Fall term 2010, Wednesdays, 14:15 - 15:30, beginning: September 22.
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Place: EPFL, room <a href="#">GR A3 31</a>
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<b>Graduate Course of the III Cycle: <a href="#">Introduction to complex analysis in several variables</a></b>
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Prof. <a href="#">Frank Kutzschebauch</a> (Bern)
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Fall term 2010, Wednesdays, 15:45 - 17:00, beginning: September 22.
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Place: EPFL, room <a href="#">GR A3 31</a>
--

<b>Advanced course: <a href="#">Groups, languages and automata</a></b>
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Prof. Sarah REES (Newcastle)
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2011, March 11, 17, 18, 31; April 1st, 7, 8; each time from 2PM to 4PM
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Neuchâtel, Institut de Mathématiques, UniMail, 11 Rue Emile Argand, Room B217
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<b>Graduate Course of the III Cycle: <a href="#">Metric embeddings in Hilbert and Banach spaces</a></b>
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Prof. <a href="#">Alain Valette</a> (Neuchâtel)
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Fall term 2011, Wednesdays, 11:15 - 12:30, beginning: September 21
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<i>Abstract:</i> In the last years, there was a remarkable convergence between three seemingly remote fields of mathematics: theoretical computer science, geometry of Banach spaces, K-theory of $C^*$ -algebras. The common theme is embeddings of discrete metric spaces into
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Hilbert or Banach spaces. Learning of techniques from other fields allowed for mutual cross-fertilization, and it is the purpose of this set of lectures to present some recent developments in this fascinating subject.

*Table of contents:*

1. Motivation I: computer science (from the Sparsest Cut problem to the Goemans-Linial conjecture, to the discrete Heisenberg group)
2. Motivation II: topology (from embeddings into Hilbert spaces to the Novikov conjecture, after G. Yu)
3. Distortion for embeddings of finite metric spaces: Bourgain's upper bound.
4. Metric spaces hard to embed: expander graphs.
5. The group connection: equivariant embeddings and the role of amenable groups.

Place: EPFL, room [CM 013](#)

### **Graduate Course of the III Cycle: [Train Tracks, Thurston and Teichmueller Theory](#)**

Prof. [Sebastian Baader](#) (Bern)

Fall term 2011, Wednesdays, 14:00 - 15:15, beginning: September 21

*Abstract:* The purpose of this course is to dive into the exciting realm of geometric topology.

Classical Teichmueller theory is about hyperbolic structures on surfaces of negative Euler characteristic. As we will see, hyperbolic metrics are characterised by the set of lengths they admit on closed curves. This naturally leads to Thurston's compactification of Teichmueller space, whose new objects are measured foliations. Using these, we will derive Thurston's classification of surface mapping classes into three types: periodic, reducible and pseudo-Anosov.

In practice, measured foliations are most efficiently described via train tracks. We will spend sometimes on constructing these, following a recent approach by Gerber.

On our way, we are going to discover various classical theorems, e.g. Hurwitz' 84(g-1) Theorem, Nielsen's realisation problem, and the theory of fibred knots and links.

Place: EPFL, room [MA 10](#)

### **Graduate Course of the III Cycle: [Floer homology with applications II](#)**

Prof. [Felix Schlenk](#) (Neuchâtel)

Fall term 2011, Wednesdays, 15:45 - 17:00, beginning: September 21

*Abstract:* The goal of the course is to construct symplectic and Lagrangian Floer homology, and to show how these two homologies can be used to solve problems in symplectic topology and Hamiltonian dynamics.

This is a sequel of the course given last year. I will therefore assume that the audience is familiar with Morse theory and Morse homology. (Though, these topics will be sketched again in one or two lectures). I will then give the geometric and topological parts of the construction of symplectic and Lagrangian Floer homology, with some, but not all, analytical details.

In the second half of the course these theories will be applied to prove several existence results for closed orbits in Hamiltonian systems (Arnold and Weinstein conjectures), to give lower bounds on the topological entropy of classical Hamiltonian systems, and to give some results on Lagrangian intersections.

Place: EPFL, room [MA 10](#)

# Swiss Doctoral Program in Mathematics

Universities of Basel, Bern, Fribourg, Geneva, Neuchâtel, and EPF Lausanne

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## Doctoral Student's Page academic year 2010/11

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On this page, all Doctoral Students of the *Doctoral Program* can announce their own talks, presentations, mini-courses etc. To do so, please fill in the corresponding [form](#).

Link to the doctoral student's page of the academic year [2006/2007](#), [2007/2008](#), [2008/2009](#), [2009/2010](#).

### Régis Straubhaar (Neuchâtel)

Lecture at the [seventh Graduate Colloquium](#) of the Swiss Doctoral Program, EPFL  
17.2.2011, 10:00: **Numerical Optimization of a Laplacian-Dirichlet's eigenvalue with respect to the domain**

*Abstract:* Given a bounded planar domain, we consider the eigenvalues of the Laplacian with Dirichlet boundary conditions. The question to know which shape (if any !) minimizes a given eigenvalue is an old one : it was conjecture in 1877 by Rayleigh (and proved in 1923 by Faber and Krahn) that the disc is the unique minimizer for the first eigenvalue. Shortly after this, Krahn and Szegö proved that the second eigenvalue is minimized by the union of two identical discs. However, for all other eigenvalues of the Dirichlet-Laplacian, the minimizer is unknown. This naturally leads to the use of finite element methods to approximate a minimizing domain.

### Nicolai Hähnle (EPFL)

Lecture at the [seventh Graduate Colloquium](#) of the Swiss Doctoral Program, EPFL  
17.2.2011, 11:15: **Efficiency of linear programming and the polynomial Hirsch conjecture**

*Abstract:* Linear programming is the problem of finding the maximum of a linear function over a polyhedron. It is widely used in practice and has been very successfully applied in solving combinatorial optimization problems as well as in approximation algorithms. The Simplex method for linear programming proceeds by walking from vertex to vertex of the polyhedron, thus connecting questions about the efficiency of linear programming to questions about the geometry of polyhedra. The polynomial Hirsch conjecture claims that the diameter of the vertex-edge graph is bounded by a polynomial in the number of defining inequalities and the dimension. I will report recent results on both the efficiency of the simplex method as well as the polynomial Hirsch conjecture.

### Georges Klein (Fribourg)

Lecture at the [seventh Graduate Colloquium](#) of the Swiss Doctoral Program, EPFL  
17.2.2011, 13:30: **Linear barycentric rational interpolation from equispaced samples and applications**

*Abstract:* Efficient linear and infinitely smooth approximation of functions from equispaced samples is an important problem in practice. Runge showed in 1901 that it is not delivered by the interpolating polynomial. In 2007, Floater and Hormann have introduced a family of linear barycentric rational interpolants which extend a construction by Berrut from 1988. These interpolants yield high theoretical rates of convergence, which depend on the smoothness of the approximated function. We will present these rational interpolants as well as a further extension and look at their condition and some of their applications to differentiation and integration.

### David Frenkel (Neuchâtel)

Lecture at the [seventh Graduate Colloquium](#) of the Swiss Doctoral Program, EPFL  
17.2.2011, 14:45: **Symplectic embedding problems and Gromov's non-squeezing theorem**

*Abstract:* We will talk about the problem of embedding symplectically an open set of an Euclidean space of even dimension into another one. In particular, we will present Gromov's non-squeezing theorem, that gives a necessary and sufficient condition to embed symplectically a ball in a symplectic cylinder. Finally, we will try to give an idea of the proof of the theorem using some symplectic invariants, called symplectic capacities.

### Kristin Shaw (Geneva)

Lecture at the [seventh Graduate Colloquium](#) of the Swiss Doctoral Program, EPFL  
17.2.2011, 15:00: **Obstructions to lifting tropical curves in complements of hyperplane arrangements**

*Abstract:* The tropicalisations of complements of hyperplane arrangements are known as Bergman fans and have a very combinatorial description. In this talk I will study tropical curves contained in these fans. First I will show how to intersect curves and explain how this relates to the intersection product of actual complex curves. Finally, I will present some obstruction theorems to lifting tropical curves in surfaces that arise from this intersection product. This talk is based on joint work in progress with Erwan Brugallé.

### Rafael Benedikt Andrist (Bern)

Lecture at the [seventh Graduate Colloquium](#) of the Swiss Doctoral Program, EPFL  
18.2.2011, 9:00: **Stein Manifolds Characterized by their Endomorphisms**

*Abstract:* Stein manifolds admitting a proper holomorphic embedding of the complex line are characterized, among all complex manifolds, by their holomorphic endomorphism semigroup in the sense that any semigroup isomorphism induces either a biholomorphic or an antibiholomorphic map between them. Several classes of Stein manifolds admitting a proper holomorphic embedding of the complex line are described.

### Bruno Duchesne (Geneva)

Lecture at the [seventh Graduate Colloquium](#) of the Swiss Doctoral Program, EPFL  
18.2.2011, 10:15: **Dynamics of isometries of nonpositively curved spaces**

*Abstract:* nonpositively curved space is a geodesic metric space such that any triangle is thinner than an euclidean one. Simply connected riemannian manifolds provide a large class of examples. We will aim to understand the dynamical behaviour of isometries of such spaces. A lot of examples will be described to improve our intuition. Moreover, we will pay our attention on the differences between finite dimensional case and infinite dimensional case.

### Loren Coquille (Geneva)

Lecture at the [eighth Graduate Colloquium](#) of the Swiss Doctoral Program, Basel  
8.9.2011, 11:30: **Gibbs measures of the 2d Ising model**

*Abstract:* In the late 1970s, in two celebrated papers, Aizenman and Higuchi independently established that all infinite-volume Gibbs measures of the 2d Ising model are a convex combination of the two pure phases. After introducing the relevant definitions and concepts needed to understand the physical content of this result, I will present a new approach to it, with a number of advantages:

- (i) a finite-volume, quantitative analogue (implying the classical claim) is obtained;
- (ii) the scheme of the proof seems more natural and provides a better picture of the underlying physical phenomenon;
- (iii) this new approach seems substantially more robust (possible extension to the Potts model).

This is a joint work with Yvan Velenik.

### Matey Mateev (Basel)

Lecture at the [eighth Graduate Colloquium](#) of the Swiss Doctoral Program, Basel  
8.9.2011, 14:00: **Hyperplane sections and degree matrices**

*Abstract:* If  $V$  is a subscheme of  $P^n$  and  $F$  is a general hypersurface of degree  $d$ , then  $F$  cuts out on  $V$  a subscheme  $Z = V \cap F$ , which is also a subscheme of  $F$ . A natural and interesting question is to study the properties that either  $Z$  or  $V$  transfers to the other. In this talk we will discuss this problem and will show how to construct a curve  $C$  in  $P^3$  whose general hyperplane section  $Z = C \cap L$  in  $P^2$  has a given degree matrix.

### Aleksandr Kolpakov (Fribourg)

Lecture at the [eighth Graduate Colloquium](#) of the Swiss Doctoral Program, Basel  
8.9.2011, 15:20: **Right-angles, hyperbolicity and dimension**

*Abstract:* Right-angled polyhedra turn out to be an interesting family of (almost) hyperbolic polytopes. They are connected with other various problems and notions, e.g. right-angled Coxeter groups, Loebell manifolds, combinatorial volume estimates and decompositions of acute-angled polyhedra, dimension bounds. In my talk, a survey on the main part of this zoo will be given together with a brief explanation of what I'm doing.

### Bastien Marmet (Neuchâtel)

Lecture at the [eighth Graduate Colloquium](#) of the Swiss Doctoral Program, Basel  
8.9.2011, 16:40: **Quasi-stationary distributions for stochastic approximation algorithms with constant step size**

### Immanuel Stampfli (Basel)

Lecture at the [eighth Graduate Colloquium](#) of the Swiss Doctoral Program, Basel  
9.9.2011, 9:30: **On the topologies on ind-varieties**

*Abstract:* In the 1960s Shafarevich introduced ind-varieties in order to explore some naturally occurring groups that allow the structure of an infinite-dimensional analogon of an algebraic group (such as the group of polynomial automorphisms of  $\mathbb{A}^n$ ). Shafarevich defined an ind-variety as the successive limit of an increasing chain

$$X_1 \subseteq X_2 \subseteq X_3 \subseteq \dots$$

of varieties  $X_n$ , each one closed in the next. There are essentially two ways of endowing such an ind-variety with a topology. One topology is naturally induced by the increasing chain of varieties and is due to Shafarevich. The other is naturally induced by the regular functions on the ind-variety and is due to Kambayashi. These topologies differ on a rather large class of ind-varieties. The aim of this talk is to give an idea of the proof of this result.

### Peter Feller (Bern)

Lecture at the [eighth Graduate Colloquium](#) of the Swiss Doctoral Program, Basel  
9.9.2011, 11:00: **Gordian distance, torus knots and three variants of adjacency**

*Abstract:* We define classical knots and explain how they form a discrete metric space with respect to the Gordian distance. Then we give different descriptions of the subspace of torus knots. Finally we introduce three notions of adjacency for torus knots and conclude with some examples of Gordian adjacency and some of our questions.

### Iulian Ion Simion (EPFL)

Lecture at the [eighth Graduate Colloquium](#) of the Swiss Doctoral Program, Basel  
9.9.2011, 13:30: **Witt groups in linear algebraic groups**

*Abstract:* After a description of Witt groups I will show how they play a role in my current work namely in studying the centralizer of unipotent elements in linear algebraic groups for small characteristic. We will describe how one constructs such subgroups with

examples both in the classical and exceptional cases.

**Maike Massierer (Basel)**

Lecture at the [eighth Graduate Colloquium](#) of the Swiss Doctoral Program, Basel

9.9.2011, 11:30: **Trace zero varieties in cryptography**

*Abstract:* Elliptic curves defined over finite fields are one of the most important types of groups used in cryptography today. Trace zero varieties arise from certain subgroups of such elliptic curves, namely those points of trace zero. They are interesting from a constructive point of view, because they allow fast arithmetic, and also from a cryptanalytic point of view, since the security of many cryptographic protocols is directly linked to the properties of these varieties. For both constructive and destructive use of trace zero varieties, it is important to be able to efficiently represent their elements. We discuss the geometric construction that leads to the trace zero variety, and how to find an easy and compact representation of trace zero elements.

# Swiss Doctoral Program in Mathematics

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## Thesis Defenses academic year 2010/11

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On this page, all Doctoral Students of the *Doctoral Program* can announce their Thesis Defense. To do so, please fill in the corresponding [form](#).

Link to the list of the academic year [2006/07](#), [2007/08](#), [2008/09](#), [2009/10](#)

<b>Michael Wiemeler (Fribourg): Thesis Defense</b>
Friday, September 3, 2010, 17:00 Lecture Room 2.52, <a href="#">Physics Building</a> , University of <a href="#">Fribourg</a> , Péroilles Chemin du musée 3, 1700 Fribourg
Title: <b>On the classification of torus manifolds with and without non-abelian symmetries</b>

# Swiss Doctoral Program in Mathematics

Universities of Basel, Bern, Fribourg, Geneva, Neuchâtel, and EPF Lausanne

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## Announce an Activity

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All faculty members, postdocs and doctoral students are invited to propose activities which are suitable for the *Doctoral Program* (see [Spectrum of Activities](#)). In particular, Doctoral Students can announce their own talks and presentations which are then displayed on the [Doctoral Student's Page](#).

<input type="text"/>	Name *
<input type="text"/>	First name *
<input type="text"/>	University *
<input type="text"/>	E-Mail *
Description:	
<input type="text"/>	
$e^{i\pi} + 1 =$ <input type="text"/> please enter the result to prove that you are not a robot.	
<input type="submit" value="Submit"/>	

\* = required fields

In case the form is not adequate, please send an e-mail with a brief description of your project to [Bruno.Colbois@unine.ch](mailto:Bruno.Colbois@unine.ch).

# Swiss Doctoral Program in Mathematics

Universities of Basel, Bern, Fribourg, Geneva, Neuchâtel, and EPF Lausanne

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## Math Departments in Switzerland

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# **Swiss Doctoral Program in Mathematics**

*Universities of Basel, Bern, Fribourg, Geneva, Neuchâtel, and EPF Lausanne*

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## **Math Departments worldwide**

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### **Directories with lists of Mathematics Departments**

- [Luchsinger's Worldwide Department Index](#)
- [Google Academic Math Departments](#)
- [The Penn State Math Directory](#)
- [The Florida State Math Directory](#)

# Swiss Doctoral Program in Mathematics

Universities of Basel, Bern, Fribourg, Geneva, Neuchâtel, and EPF Lausanne

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## Mathematical Societies

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### Quick links

- [Swiss Mathematical Society](#)
- [DMV Deutsche Mathematiker-Vereinigung](#)
- [EMS European Mathematical Society](#)
- [AMS American Mathematical Society](#)
- [IMU International Mathematical Union](#)
- [SIAM Society for Industrial and Applied Mathematics](#)
- [LMS London Mathematical Society](#)
- [GAMM Gesellschaft für Angewandte Mathematik und Mechanik](#)
- [ÖMG Österreichische Mathematische Gesellschaft](#)
- [UMI Unione Matematica Italiana](#)
- [SMF Société Mathématique de France](#)
- [SMAI Société de Mathématiques Appliquées](#)
- [ICIAM International Council for Industrial and Applied Mathematics](#)
- [GMFH/SMHES Gesellschaft für Mathematik an den Schweizer Fachhochschulen](#)
- [VSMP/SSPMP Verein der Schweizerischen Mathematik- und Physiklehrpersonen](#)

NB: EMS offers a [free one year membership](#) to PhD students.

### Other directories

- [Luchsinger's Worldwide Society Index](#)
- [EMS Member Societies](#)
- [IMU Member Societies](#)
- [ICIAM Member Societies](#)

# Swiss Doctoral Program in Mathematics

Universities of Basel, Bern, Fribourg, Geneva, Neuchâtel, and EPF Lausanne

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## Search results

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<i>Name</i>	David <b>Albertani</b>	DATA
<i>E-mail</i>	<a href="mailto:David.Albertani@unige.ch">David.Albertani@unige.ch</a>	
<i>University</i>	Genève	
<i>Advisor</i>	Yvan Velenik	

<i>Name</i>	Martin <b>Anderegg</b>	DATA
<i>E-mail</i>	<a href="mailto:Martin.Anderegg@unige.ch">Martin.Anderegg@unige.ch</a>	
<i>University</i>	Genève	
<i>Advisor</i>	Nicolas Monod	

<i>Name</i>	Rafael Benedikt <b>Andrist</b>	DATA
<i>E-mail</i>	<a href="mailto:rafael.andrist@math.unibe.ch">rafael.andrist@math.unibe.ch</a>	
<i>University</i>	Bern	
<i>Advisor</i>	Frank Kutzschebauch	

<i>Name</i>	Kolawolé Akansa Sourou <b>Atchade</b>	DATA
<i>E-mail</i>	<a href="mailto:kolawole.atchade@unine.ch">kolawole.atchade@unine.ch</a>	
<i>University</i>	Neuchâtel	
<i>Advisor</i>	Michel Benaïm	

<i>Name</i>	Yves <b>Barmaz</b>	DATA
<i>E-mail</i>	<a href="mailto:yves.barmaz@unige.ch">yves.barmaz@unige.ch</a>	
<i>University</i>	Genève	
<i>Advisor</i>	Anton Alekseev	

<i>Name</i>	Nicolas <b>Bartholdi</b>	DATA
<i>E-mail</i>	<a href="mailto:nicolas.bartholdi@unige.ch">nicolas.bartholdi@unige.ch</a>	
<i>University</i>	Genève	
<i>Advisor</i>	Daniel Coray	

<i>Name</i>	Reto <b>Berger</b>	DATA
<i>E-mail</i>	<a href="mailto:reto.berger@math.unibe.ch">reto.berger@math.unibe.ch</a>	
<i>University</i>	Bern	
<i>Advisor</i>	Zoltan Balogh	

<i>Name</i>	Amandine <b>Berger</b>	DATA
<i>E-mail</i>	<a href="mailto:amandine.berger@unine.ch">amandine.berger@unine.ch</a>	
<i>University</i>	Neuchâtel	
<i>Advisor</i>	Bruno Colbois	

<i>Name</i>	Stefan <b>Borell</b>	DATA
<i>E-mail</i>	<a href="mailto:borell@math.unibe.ch">borell@math.unibe.ch</a>	

<i>University</i>	Bern
<i>Advisor</i>	Frank Kutzschebauch

<i>Name</i>	Jonas <b>Budmiger</b>
<i>E-mail</i>	<a href="mailto:jonas.budmiger@stud.unibas.ch">jonas.budmiger@stud.unibas.ch</a>
<i>University</i>	Basel
<i>Advisor</i>	Hanspeter Kraft

<i>Name</i>	Caterina <b>Campagnolo</b>
<i>E-mail</i>	<a href="mailto:Caterina.Campagnolo@unige.ch">Caterina.Campagnolo@unige.ch</a>
<i>University</i>	Genève
<i>Advisor</i>	Michelle Bucher-Karlsson

<i>Name</i>	Yves <b>Courvoisier</b>
<i>E-mail</i>	<a href="mailto:yves.courvoisier@unige.ch">yves.courvoisier@unige.ch</a>
<i>University</i>	Genève
<i>Advisor</i>	Martin Gander

<i>Name</i>	Fabien <b>Crevoisier</b>
<i>E-mail</i>	<a href="mailto:fabien.crevoisier@unine.ch">fabien.crevoisier@unine.ch</a>
<i>University</i>	Neuchâtel
<i>Advisor</i>	Olivier Besson, Bruno Colbois

<i>Name</i>	Irina <b>Davydenkova</b>
<i>E-mail</i>	<a href="mailto:irina.davydenkova@unige.ch">irina.davydenkova@unige.ch</a>
<i>University</i>	Genève
<i>Advisor</i>	Anton Alekseev

<i>Name</i>	Souleymane <b>Doucoure</b>
<i>E-mail</i>	<a href="mailto:souleymane.doucoure@unine.ch">souleymane.doucoure@unine.ch</a>
<i>University</i>	Neuchâtel
<i>Advisor</i>	Olivier Besson

<i>Name</i>	Dennis <b>Dreesen</b>
<i>E-mail</i>	<a href="mailto:dennis.dreesen@unine.ch">dennis.dreesen@unine.ch</a>
<i>University</i>	Neuchâtel
<i>Advisor</i>	Alain Valette

<i>Name</i>	Bruno <b>Duchesne</b>
<i>E-mail</i>	<a href="mailto:bruno.duchesne@unige.ch">bruno.duchesne@unige.ch</a>
<i>University</i>	Genève
<i>Advisor</i>	Nicolas Monod

<i>Name</i>	Hugo <b>Duminil</b>
<i>E-mail</i>	<a href="mailto:hugo.duminil@unige.ch">hugo.duminil@unige.ch</a>
<i>University</i>	Genève
<i>Advisor</i>	Stanislav Smirnov

<i>Name</i>	Vincent <b>Emery</b>
-------------	----------------------

*E-mail* [vincent.emery@unifr.ch](mailto:vincent.emery@unifr.ch)  
*University* Fribourg  
*Advisor* Ruth Kellerhals

*Name* Nicola **Ermotti**  
*E-mail* [nicola.ermotti@unige.ch](mailto:nicola.ermotti@unige.ch)  
*University* Genève  
*Advisor* Cam Van Quach Hongler

*Name* Cyrille **Extermann**  
*E-mail* [Cyrille.Extermann@unige.ch](mailto:Cyrille.Extermann@unige.ch)  
*University* Genève  
*Advisor* Thierry Vust & Anton Alekseev

*Name* Federica **Fanoni**  
*E-mail* [federica.fanoni@unifr.ch](mailto:federica.fanoni@unifr.ch)  
*University* Fribourg  
*Advisor* Hugo Parlier

*Name* Katrin **Fässler**  
*E-mail* [katrin.faessler@math.unibe.ch](mailto:katrin.faessler@math.unibe.ch)  
*University* Bern  
*Advisor* Zoltan Balogh

*Name* Chrystel **Feller**  
*E-mail* [chrystel.feller@unifr.ch](mailto:chrystel.feller@unifr.ch)  
*University* Fribourg  
*Advisor* Jean-Pierre Gabriel, Christian Mazza

*Name* Peter **Feller**  
*E-mail* [peter.feller@math.unibe.ch](mailto:peter.feller@math.unibe.ch)  
*University* Bern  
*Advisor* Sebastian Baader

*Name* Francois **Fillastre**  
*E-mail* [francois.fillastre@unine.ch](mailto:francois.fillastre@unine.ch)  
*University* Neuchâtel  
*Advisor* Bruno Colbois

*Name* Shaula **Fiorelli Vilmart**  
*E-mail* [shaula.fiorelli@unige.ch](mailto:shaula.fiorelli@unige.ch)  
*University* Genève  
*Advisor* Anton Alekseev

*Name* Thomas **Fournier**  
*E-mail* [thomas.fournier@unifr.ch](mailto:thomas.fournier@unifr.ch)  
*University* Fribourg  
*Advisor* Jean-Pierre Gabriel

*Name* David **Frenkel**

<i>E-mail</i>	<a href="mailto:david.frenkel@unine.ch">david.frenkel@unine.ch</a>
<i>University</i>	Neuchâtel
<i>Advisor</i>	Felix Schlenk

<i>Name</i>	Caroline <b>Giacobino</b>
<i>E-mail</i>	<a href="mailto:caroline.giacobino@unige.ch">caroline.giacobino@unige.ch</a>
<i>University</i>	Genève
<i>Advisor</i>	Sylvain Sardy

<i>Name</i>	Christian <b>Graf</b>
<i>E-mail</i>	<a href="mailto:christian.graf@stud.unibas.ch">christian.graf@stud.unibas.ch</a>
<i>University</i>	Basel
<i>Advisor</i>	Norbert A'Campo

<i>Name</i>	Jordane <b>Granier</b>
<i>E-mail</i>	<a href="mailto:jordane.granier@ens-lyon.org">jordane.granier@ens-lyon.org</a>
<i>University</i>	Fribourg
<i>Advisor</i>	Ruth Kellerhals

<i>Name</i>	Luc <b>Guyot</b>
<i>E-mail</i>	<a href="mailto:luc.guyot@unige.ch">luc.guyot@unige.ch</a>
<i>University</i>	Genève
<i>Advisor</i>	Goulnara Arjantseva

<i>Name</i>	Philipp <b>Habegger</b>
<i>E-mail</i>	<a href="mailto:Philipp-Erich-W.Habegger@stud.unibas.ch">Philipp-Erich-W.Habegger@stud.unibas.ch</a>
<i>University</i>	Basel
<i>Advisor</i>	David Masser

<i>Name</i>	Asma <b>Hassannezhad</b>
<i>E-mail</i>	<a href="mailto:asma.hassannezhad@unine.ch">asma.hassannezhad@unine.ch</a>
<i>University</i>	Neuchâtel
<i>Advisor</i>	Bruno Colbois

<i>Name</i>	Muriel <b>Heistercamp</b>
<i>E-mail</i>	<a href="mailto:muriel.heistercamp@unine.ch">muriel.heistercamp@unine.ch</a>
<i>University</i>	Neuchâtel
<i>Advisor</i>	Felix Schlenk

<i>Name</i>	Philippe <b>Henry</b>
<i>E-mail</i>	<a href="mailto:Philippe.Henry@unige.ch">Philippe.Henry@unige.ch</a>
<i>University</i>	Genève
<i>Advisor</i>	Nicolas Monod

<i>Name</i>	Pieters <b>Hester</b>
<i>E-mail</i>	<a href="mailto:hesterpieters@gmail.com">hesterpieters@gmail.com</a>
<i>University</i>	Genève
<i>Advisor</i>	Michelle Bucher-Karlsson

<i>Name</i>	Philip <b>Heuser</b>	DATA
<i>E-mail</i>	<a href="mailto:philip.heuser@unibas.ch">philip.heuser@unibas.ch</a>	
<i>University</i>	Basel	
<i>Advisor</i>	Ben Schweizer	

<i>Name</i>	Thierry <b>Hild</b>	DATA
<i>E-mail</i>	<a href="mailto:thierry.hild@unifr.ch">thierry.hild@unifr.ch</a>	
<i>University</i>	Fribourg	
<i>Advisor</i>	Ruth Kellerhals	

<i>Name</i>	Clément <b>Hongler</b>	DATA
<i>E-mail</i>	<a href="mailto:clement.hongler@unige.ch">clement.hongler@unige.ch</a>	
<i>University</i>	Genève	
<i>Advisor</i>	Stanislav Smirnov	

<i>Name</i>	Regis <b>Houssou</b>	DATA
<i>E-mail</i>	<a href="mailto:regis.houssou@unine.ch">regis.houssou@unine.ch</a>	
<i>University</i>	Neuchâtel	
<i>Advisor</i>	Olivier Besson	

<i>Name</i>	Olivier <b>Isely</b>	DATA
<i>E-mail</i>	<a href="mailto:olivier.isely@unine.ch">olivier.isely@unine.ch</a>	
<i>University</i>	Neuchâtel	
<i>Advisor</i>	Alain Valette	

<i>Name</i>	Matthieu <b>Jacquemet</b>	DATA
<i>E-mail</i>	<a href="mailto:matthieu.jacquemet@unifr.ch">matthieu.jacquemet@unifr.ch</a>	
<i>University</i>	Fribourg	
<i>Advisor</i>	Ruth Kellerhals	

<i>Name</i>	Pierre-Nicolas <b>Jolissaint</b>	DATA
<i>E-mail</i>	<a href="mailto:pierre-nicolas.jolissaint@unine.ch">pierre-nicolas.jolissaint@unine.ch</a>	
<i>University</i>	Neuchâtel	
<i>Advisor</i>	Alain Valette	

<i>Name</i>	Maté Lehel <b>Juhasz</b>	DATA
<i>E-mail</i>	<a href="mailto:Mate.Juhasz@unige.ch">Mate.Juhasz@unige.ch</a>	
<i>University</i>	Genève	
<i>Advisor</i>	Andras Szenes	

<i>Name</i>	Kamran <b>Kalbasi</b>	DATA
<i>E-mail</i>	<a href="mailto:kamran.kalbasi@epfl.ch">kamran.kalbasi@epfl.ch</a>	
<i>University</i>	EPF Lausanne	
<i>Advisor</i>	Thomas Mountford	

<i>Name</i>	Mucyo <b>Karemera</b>	DATA
<i>E-mail</i>	<a href="mailto:Mucyo.Karemera@unige.ch">Mucyo.Karemera@unige.ch</a>	
<i>University</i>	Genève	
<i>Advisor</i>	Rinat Kashaev	

<i>Name</i>	Georges <b>Klein</b>	DATA
<i>E-mail</i>	<a href="mailto:georges.klein@unifr.ch">georges.klein@unifr.ch</a>	
<i>University</i>	Fribourg	
<i>Advisor</i>	Jean-Paul Berrut	

<i>Name</i>	Aleksandr <b>Kolpakov</b>	DATA
<i>E-mail</i>	<a href="mailto:aleksandr.kolpakov@unifr.ch">aleksandr.kolpakov@unifr.ch</a>	
<i>University</i>	Fribourg	
<i>Advisor</i>	Ruth Kellerhals	

<i>Name</i>	Aline <b>Kurtzmann</b>	DATA
<i>E-mail</i>	<a href="mailto:aline.kurtzmann@unine.ch">aline.kurtzmann@unine.ch</a>	
<i>University</i>	Neuchâtel	
<i>Advisor</i>	Michel Benaïm	

<i>Name</i>	Lionel <b>Lang</b>	DATA
<i>E-mail</i>	<a href="mailto:lionel.lang@unige.ch">lionel.lang@unige.ch</a>	
<i>University</i>	Genève	
<i>Advisor</i>	Grigory Mikhalkin	

<i>Name</i>	Paul-Henry <b>Leemann</b>	DATA
<i>E-mail</i>	<a href="mailto:leemann0@etu.unige.ch">leemann0@etu.unige.ch</a>	
<i>University</i>	Genève	
<i>Advisor</i>	Tatiana Smirnova-Nagnibeda	

<i>Name</i>	Matthias <b>Leuenberger</b>	DATA
<i>E-mail</i>	<a href="mailto:matthias.leuenberger@math.unibe.ch">matthias.leuenberger@math.unibe.ch</a>	
<i>University</i>	Bern	
<i>Advisor</i>	Frank Kutzschebauch	

<i>Name</i>	Roland <b>Lötscher</b>	DATA
<i>E-mail</i>	<a href="mailto:rolandlo@gmail.com">rolandlo@gmail.com</a>	
<i>University</i>	Basel	
<i>Advisor</i>	Hanspeter Kraft	

<i>Name</i>	Justine <b>Louis</b>	DATA
<i>E-mail</i>	<a href="mailto:Justine.Louis@unige.ch">Justine.Louis@unige.ch</a>	
<i>University</i>	Genève	
<i>Advisor</i>	Anders Karlsson	

<i>Name</i>	Bankim <b>Mandal</b>	DATA
<i>E-mail</i>	<a href="mailto:Bankim.Mandal@unige.ch">Bankim.Mandal@unige.ch</a>	
<i>University</i>	Genève	
<i>Advisor</i>	Martin Gander	

<i>Name</i>	Tatiana <b>Mantuano</b>	DATA
<i>E-mail</i>	<a href="mailto:tatiana.mantuano@unine.ch">tatiana.mantuano@unine.ch</a>	
<i>University</i>	Neuchâtel	
<i>Advisor</i>	Bruno Colbois	

<i>Name</i>	Bastien <b>Marmet</b>	DATA
<i>E-mail</i>	<a href="mailto:bastien.marmet@unine.ch">bastien.marmet@unine.ch</a>	
<i>University</i>	Neuchâtel	
<i>Advisor</i>	Michel Benaïm	
<i>Name</i>	Maike <b>Massierer</b>	DATA
<i>E-mail</i>	<a href="mailto:maike.massierer@unibas.ch">maike.massierer@unibas.ch</a>	
<i>University</i>	Basel	
<i>Advisor</i>	Elisa Gorla	
<i>Name</i>	Matey <b>Mateev</b>	DATA
<i>E-mail</i>	<a href="mailto:matey.mateev@unibas.ch">matey.mateev@unibas.ch</a>	
<i>University</i>	Basel	
<i>Advisor</i>	Elisa Gorla	
<i>Name</i>	Stéphane <b>Materna</b>	DATA
<i>E-mail</i>	<a href="mailto:stephane.materna@math.unibe.ch">stephane.materna@math.unibe.ch</a>	
<i>University</i>	Bern	
<i>Advisor</i>	Christine Riedtmann	
<i>Name</i>	Michel <b>Matter</b>	DATA
<i>E-mail</i>	<a href="mailto:michel.matter@unige.ch">michel.matter@unige.ch</a>	
<i>University</i>	Genève	
<i>Advisor</i>	Tatiana Smirnova-Nagnibeda	
<i>Name</i>	Thomas <b>Mettler</b>	DATA
<i>E-mail</i>	<a href="mailto:thomas.mettler@unifr.ch">thomas.mettler@unifr.ch</a>	
<i>University</i>	Fribourg	
<i>Advisor</i>	Norbert Hungerbühler	
<i>Name</i>	Filip <b>Misev</b>	DATA
<i>E-mail</i>	<a href="mailto:filip.misev@stud.unibas.ch">filip.misev@stud.unibas.ch</a>	
<i>University</i>	Basel	
<i>Advisor</i>	Jérémy Blanc	
<i>Name</i>	Daniel Arnold <b>Moldovan</b>	DATA
<i>E-mail</i>	<a href="mailto:danielarnold.moldovan@epfl.ch">danielarnold.moldovan@epfl.ch</a>	
<i>University</i>	EPF Lausanne	
<i>Advisor</i>	Prof. Eva Bayer Fluckiger	
<i>Name</i>	Samuel <b>Monnier</b>	DATA
<i>E-mail</i>	<a href="mailto:samuel.monnier@unige.ch">samuel.monnier@unige.ch</a>	
<i>University</i>	Genève	
<i>Advisor</i>	Anton Alekseev	
<i>Name</i>	Soyoung <b>Moon</b>	DATA
<i>E-mail</i>	<a href="mailto:so.moon@unine.ch">so.moon@unine.ch</a>	
<i>University</i>	Neuchâtel	
<i>Advisor</i>	Alain Valette	

<i>Name</i>	Filip <b>Moric</b>	DATA
<i>E-mail</i>	<a href="mailto:filip.moric@epfl.ch">filip.moric@epfl.ch</a>	
<i>University</i>	EPF Lausanne	
<i>Advisor</i>	János Pach	

<i>Name</i>	Dorothee <b>Müller</b>	DATA
<i>E-mail</i>	<a href="mailto:gorothee.mueller@unine.ch">dorothee.mueller@unine.ch</a>	
<i>University</i>	Neuchâtel	
<i>Advisor</i>	Felix Schlenk	

<i>Name</i>	Felix <b>Mustermann</b>	DATA
<i>E-mail</i>	<a href="mailto:norbert.hungerbuehler@unifr.ch">norbert.hungerbuehler@unifr.ch</a>	
<i>University</i>	Fribourg	
<i>Advisor</i>	Norbert Hungerbühler	

<i>Name</i>	Aglaia <b>Myropolska</b>	DATA
<i>E-mail</i>	<a href="mailto:aglaya.m@gmail.com">aglaya.m@gmail.com</a>	
<i>University</i>	Genève	
<i>Advisor</i>	Tatiana Smirnova-Nagnibeda	

<i>Name</i>	Jan <b>Nesemann</b>	DATA
<i>E-mail</i>	<a href="mailto:jan.nesemann@math.unibe.ch">jan.nesemann@math.unibe.ch</a>	
<i>University</i>	Bern	
<i>Advisor</i>	Christiane Tretter	

<i>Name</i>	Geneviève, <b>Perren</b>	DATA
<i>E-mail</i>	<a href="mailto:genevieve.perren@unifr.ch">genevieve.perren@unifr.ch</a>	
<i>University</i>	Fribourg	
<i>Advisor</i>	Ruth Kellerhals	

<i>Name</i>	Bram <b>Petri</b>	DATA
<i>E-mail</i>	<a href="mailto:bram.petri@unifr.ch">bram.petri@unifr.ch</a>	
<i>University</i>	Fribourg	
<i>Advisor</i>	Hugo Parlier	

<i>Name</i>	EPFL <b>PhD Students</b>	DATA
<i>E-mail</i>	<a href="mailto:doc-edma-ext@epfl.ch">doc-edma-ext@epfl.ch</a>	
<i>University</i>	EPF Lausanne	
<i>Advisor</i>	Friedrich Eisenbrand	

<i>Name</i>	Thibault <b>Pillon</b>	DATA
<i>E-mail</i>	<a href="mailto:thibault.pillon@unine.ch">thibault.pillon@unine.ch</a>	
<i>University</i>	Neuchâtel	
<i>Advisor</i>	Alain Valette	

<i>Name</i>	Maria <b>Podkopaeva</b>	DATA
<i>E-mail</i>	<a href="mailto:Maria.Podkopaeva@unige.ch">Maria.Podkopaeva@unige.ch</a>	
<i>University</i>	Genève	

<i>Advisor</i>	Anton Alekseev	
<i>Name</i>	Mihaela Ileana <b>Popoviciu Draisma</b>	DATA
<i>E-mail</i>	<a href="mailto:mihaela.popoviciu@unibas.ch">mihaela.popoviciu@unibas.ch</a>	
<i>University</i>	Basel	
<i>Advisor</i>	Hanspeter Kraft	
<i>Name</i>	Pavel <b>Putrov</b>	DATA
<i>E-mail</i>	<a href="mailto:Pavel.Putrov@unige.ch">Pavel.Putrov@unige.ch</a>	
<i>University</i>	Genève	
<i>Advisor</i>	Marcos Marino	
<i>Name</i>	Elham <b>Rajabzadeh Moghaddam</b>	DATA
<i>E-mail</i>	<a href="mailto:ermoghadam@gmail.com">ermoghadam@gmail.com</a>	
<i>University</i>	Fribourg	
<i>Advisor</i>	Jean-Paul Berrut	
<i>Name</i>	Maria Fernanda <b>Robayo</b>	DATA
<i>E-mail</i>	<a href="mailto:maferobayo@gmail.com">maferobayo@gmail.com</a>	
<i>University</i>	Basel	
<i>Advisor</i>	Jeremy Blanc	
<i>Name</i>	Rudolf <b>Rohr</b>	DATA
<i>E-mail</i>	<a href="mailto:Rudolf.Rohr@unige.ch">Rudolf.Rohr@unige.ch</a>	
<i>University</i>	Genève	
<i>Advisor</i>	Anton Alekseev	
<i>Name</i>	Gregory <b>Roth</b>	DATA
<i>E-mail</i>	<a href="mailto:gregory.roth@unine.ch">gregory.roth@unine.ch</a>	
<i>University</i>	Neuchâtel	
<i>Advisor</i>	Michel Benaïm	
<i>Name</i>	Christoph <b>Röthlisberger</b>	DATA
<i>E-mail</i>	<a href="mailto:roethlisberger@math.unibe.ch">roethlisberger@math.unibe.ch</a>	
<i>University</i>	Bern	
<i>Advisor</i>	George Metcalfe	
<i>Name</i>	Stefan <b>Sakalos</b>	DATA
<i>E-mail</i>	<a href="mailto:pista.sakalos@gmail.com">pista.sakalos@gmail.com</a>	
<i>University</i>	Genève	
<i>Advisor</i>	Pavol Severa	
<i>Name</i>	Heike <b>Scherer</b>	DATA
<i>E-mail</i>	<a href="mailto:Heike.Scherer@unige.ch">Heike.Scherer@unige.ch</a>	
<i>University</i>	Genève	
<i>Advisor</i>	Christian Mazza	
<i>Name</i>	Krishnendra <b>Shekhawat</b>	DATA
<i>E-mail</i>	<a href="mailto:Krishnendra.Shekhawat@unige.ch">Krishnendra.Shekhawat@unige.ch</a>	
<i>University</i>	Genève	

<i>Advisor</i>	Daniel Coray	
<i>Name</i>	Imbo <b>Sim</b>	DATA
<i>E-mail</i>	<a href="mailto:imbo.sim@unibas.ch">imbo.sim@unibas.ch</a>	
<i>University</i>	Basel	
<i>Advisor</i>	Marcus Grote	
<i>Name</i>	Zahra <b>Sinaei</b>	DATA
<i>E-mail</i>	<a href="mailto:zahra.sinaei@epfl.ch">zahra.sinaei@epfl.ch</a>	
<i>University</i>	EPF Lausanne	
<i>Advisor</i>	Marc Troyanov	
<i>Name</i>	Claudio <b>Somaini</b>	DATA
<i>E-mail</i>	<a href="mailto:claudio.somaini@math.unibe.ch">claudio.somaini@math.unibe.ch</a>	
<i>University</i>	Bern	
<i>Advisor</i>	Christine Riedtmann	
<i>Name</i>	Immanuel <b>Stampfli</b>	DATA
<i>E-mail</i>	<a href="mailto:immanuel.stampfli@unibas.ch">immanuel.stampfli@unibas.ch</a>	
<i>University</i>	Basel	
<i>Advisor</i>	Hanspeter Kraft	
<i>Name</i>	Sebastien <b>Stevan</b>	DATA
<i>E-mail</i>	<a href="mailto:Sebastien.Stevan@unige.ch">Sebastien.Stevan@unige.ch</a>	
<i>University</i>	Genève	
<i>Advisor</i>	Marcos Mariño	
<i>Name</i>	Julien <b>Straubhaar</b>	DATA
<i>E-mail</i>	<a href="mailto:julien.straubhaar@unine.ch">julien.straubhaar@unine.ch</a>	
<i>University</i>	Neuchâtel	
<i>Advisor</i>	Olivier Besson	
<i>Name</i>	Régis <b>Straubhaar</b>	DATA
<i>E-mail</i>	<a href="mailto:regis.straubhaar@unine.ch">regis.straubhaar@unine.ch</a>	
<i>University</i>	Neuchâtel	
<i>Advisor</i>	Bruno Colbois, Olivier Besson	
<i>Name</i>	Géza Zsolt <b>Szilágyi Szolt</b>	DATA
<i>E-mail</i>	<a href="mailto:zsolt.szilagyi@unige.ch">zsolt.szilagyi@unige.ch</a>	
<i>University</i>	Genève	
<i>Advisor</i>	Andras Szenes	
<i>Name</i>	Arlette Love <b>Temfack Djeulezeck</b>	DATA
<i>E-mail</i>	<a href="mailto:arlette.temfack@unine.ch">arlette.temfack@unine.ch</a>	
<i>University</i>	Neuchâtel	
<i>Advisor</i>	Bruno Colbois	
<i>Name</i>	Gerry <b>Tong Che</b>	DATA
<i>E-mail</i>	<a href="mailto:gerrytongche@gmail.com">gerrytongche@gmail.com</a>	

<i>University</i>	Genève	
<i>Advisor</i>	Stanislav Smirnov	
<i>Name</i>	Gilles <b>Vilmart</b>	DATA
<i>E-mail</i>	<a href="mailto:gilles.vilmart@unige.ch">gilles.vilmart@unige.ch</a>	
<i>University</i>	Genève	
<i>Advisor</i>	Ernst Hairer	
<i>Name</i>	Guilherme <b>Vorpe</b>	DATA
<i>E-mail</i>	<a href="mailto:guilherme.vorpe@unige.ch">guilherme.vorpe@unige.ch</a>	
<i>University</i>	Genève	
<i>Advisor</i>	Pierre-Alain Cherix	
<i>Name</i>	Alain <b>Weber</b>	DATA
<i>E-mail</i>	<a href="mailto:alain.weber@ips.unibe.ch">alain.weber@ips.unibe.ch</a>	
<i>University</i>	Bern	
<i>Advisor</i>	Richard Smith	
<i>Name</i>	Nicolas <b>Weisskopf</b>	DATA
<i>E-mail</i>	<a href="mailto:nicolas.weisskopf@unifr.ch">nicolas.weisskopf@unifr.ch</a>	
<i>University</i>	Fribourg	
<i>Advisor</i>	Anand Dessai	
<i>Name</i>	Martin <b>Widmer</b>	DATA
<i>E-mail</i>	<a href="mailto:martin.widmer@stud.unibas.ch">martin.widmer@stud.unibas.ch</a>	
<i>University</i>	Basel	
<i>Advisor</i>	David Masser	
<i>Name</i>	Michael <b>Wiemeler</b>	DATA
<i>E-mail</i>	<a href="mailto:michael.wiemeler@unifr.ch">michael.wiemeler@unifr.ch</a>	
<i>University</i>	Fribourg	
<i>Advisor</i>	Anand Dessai	
<i>Name</i>	Raphael <b>Wullschleger</b>	DATA
<i>E-mail</i>	<a href="mailto:raphael.wullschleger@unine.ch">raphael.wullschleger@unine.ch</a>	
<i>University</i>	Neuchâtel	
<i>Advisor</i>	Felix Schlenk	
<i>Name</i>	Christian <b>Wyss</b>	DATA
<i>E-mail</i>	<a href="mailto:cwyss@math.unibe.ch">cwyss@math.unibe.ch</a>	
<i>University</i>	Bern	
<i>Advisor</i>	Christiane Tretter	
<i>Name</i>	Florence <b>Yerly</b>	DATA
<i>E-mail</i>	<a href="mailto:florence.yerly@unifr.ch">florence.yerly@unifr.ch</a>	
<i>University</i>	Fribourg	
<i>Advisor</i>	Christian Mazza	
<i>Name</i>	Thomas <b>Zürcher</b>	DATA
<i>E-mail</i>	<a href="mailto:thomas.zuercher@math.unibe.ch">thomas.zuercher@math.unibe.ch</a>	

<i>University</i>	Bern
<i>Advisor</i>	Zoltan Balogh

<i>Name</i>	Rimer <b>Zurita</b>
<i>E-mail</i>	<a href="mailto:Rimer.Zurita@unige.ch">Rimer.Zurita@unige.ch</a>
<i>University</i>	Genève
<i>Advisor</i>	Petermann Yves

DATA

To see your record, click on DATA and enter your password.

# Swiss Doctoral Program in Mathematics

Universities of Basel, Bern, Fribourg, Geneva, Neuchâtel, and EPF Lausanne

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## Your data record

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To notify an achievement or change your data, please use the [validation form](#) or send an e-mail to [Bruno.Colbois@unine.ch](mailto:Bruno.Colbois@unine.ch).

### Basic Data

Name	Jonas <b>Budmiger</b>
E-mail	<a href="mailto:jonas.budmiger@stud.unibas.ch">jonas.budmiger@stud.unibas.ch</a>
University	Basel
Advisor	<a href="#">Hanspeter Kraft</a>
Entry date	2006-08-10

### Program Achievements

**Category 1:** Participation in graduate courses

#### Graduate Course: Local Cohomology and Sheaf Cohomology

Fall term 2007, University of Zürich

Instructor: Markus Brodmann

*ECTS points:* 3

*Reimbursement:* 382.50 CHF

#### Graduate course: Algebraische Zahlentheorie

Fall term 2007, University of [Basel](#)

Instructor: David Masser

*ECTS points:* 3

#### Graduate course: Introduction to category theory

Spring term 2008, University of Basel

Course instructor: Giordano Favi

*ECTS points:* 3

#### Graduate course: Höhentheorie

Spring term 2008, University of Basel

Course instructor: David Masser
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<i>ECTS points: 3</i>
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## Category 2: Participation in conferences

<b>Summer school: Aspects of moduli theory</b>
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June 16 - 19, 2008, Scuola Normale Superiore di Pisa
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<i>ECTS points: 3</i>
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<b>Workshop: Representation Theory Days in Zurich</b>
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Zurich, November 27 - 29, 2008
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Course instructor: Karin Baur
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<i>ECTS points: 3</i>
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## Category 3: Presentation of own research results

<b>Jonas Budmiger (Basel)</b>
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Lecture at the <a href="#">Graduate Colloquium</a> of the Swiss Doctoral Program, Bern 24.1.2008, 16:00: An Example of an $SL_2$ -Hilbert Scheme
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<i>ECTS points: 3</i>
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<b>Jonas Budmiger (Basel)</b>
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Lecture at the <a href="#">Fifth Graduate Colloquium</a> of the Swiss Doctoral Program, Fribourg 29.1.2009, 11:15: From Moduli Spaces to Invariant Hilbert Schemes
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<i>ECTS points: 3</i>
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## Category 5: Complementary scientific training

<b>Second Graduate Colloquium</b>
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May 29 - 30, 2007, Basel
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Organization: <a href="#">Jonas Budmiger</a> , <a href="#">Philipp Habegger</a>
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<i>ECTS points: 3</i>
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## Category 6: Work as assistant

<b>Teaching, tutoring, administration</b>
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Mathematics Institute, University of Basel

*ECTS points: 6*

## Prizes

### Third Graduate Colloquium

January 24-25, 2008, Bern

**Jonas Budmiger: Birkhäuser Prize for the Best Talk**

## Summary

Category	Required	Attained
1	9	12
2	6	6
3	6	6
4		0
5		3
6		6
<i>Total</i>	<i>30</i>	<i>33</i>
<b>Total reimbursement</b>		
<i>382.5 CHF</i>		

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## Research Groups

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Professor	University	Field
<a href="#">Michel Benaïm</a>	<a href="#">Neuchâtel</a>	Probability
<a href="#">Bruno Colbois</a>	<a href="#">Neuchâtel</a>	Riemannian geometry, metric geometry
<a href="#">Alain Valette</a>	<a href="#">Neuchâtel</a>	Analysis on groups (group algebras, harmonic analysis, geometric group theory)
<a href="#">Anand Dessai</a>	<a href="#">Fribourg</a>	Geometric topology (Lie group actions on manifolds, elliptic genera, curvature and symmetry)
<a href="#">Ruth Kellerhals</a>	<a href="#">Fribourg</a>	Hyperbolic Geometry, Geometry of Discrete Groups
<a href="#">Elisa Gorla</a>	<a href="#">Basel</a>	commutative algebra, algebraic geometry, cryptography, coding theory
<a href="#">Hanspeter Kraft</a>	<a href="#">Basel</a>	algebraic transformation groups, representation theory, geometric and computational invariant theory
<a href="#">David Masser</a>	<a href="#">Basel</a>	Number theory (diophantine geometry, diophantine approximation, and transcendental numbers)
<a href="#">Richard S. Smith</a>	<a href="#">Bern</a>	Simulation modeling of plant development
<a href="#">Yvan Velenik</a>	<a href="#">Geneva</a>	Probability theory, statistical physics

# Swiss Doctoral Program in Mathematics

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## Prizes

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On the occasion of the **Graduate Colloquium** of the Swiss Doctoral Program **Birkhäuser Publishing House** awards a prize for the best talk and a prize for the best poster.

Date	Prize	Laureate
8.12.2006	Best talk	Philipp Habegger (Basel)
8.12.2006	Best poster	François Fillastre (Neuchâtel)
29.5.2007	Best talk	Thierry Hild (Fribourg)
29.5.2007	Best poster	Shaula Fiorelli (Geneva)
13.9.2007	Swiss Academy of Sciences: Prix Jeunes Chercheurs	Jonas Budmiger (Basel)
13.9.2007	Swiss Academy of Sciences: Prix A.F. Schläfli	Tatiana Mantuano (Neuchâtel)
25.1.2008	Best talk	Jonas Budmiger (Basel)
25.1.2008	Best poster	Clément Hongler (Geneva)
19.9.2008	Best talk	Roland Lötscher (Basel)
19.9.2008	Best poster	Yves Courvoisier (Geneva)
30.1.2009	Best talk	Katrin Fässler (Bern)
30.1.2009	Best poster	Roland Lötscher (Basel)
12.2.2010	Best talk	Georges Klein (Fribourg)
12.2.2010	Best poster	Grégory Roth (Neuchâtel)
18.2.2011	Best talk	Kirstin Shaw (Geneva)
18.2.2011	Best poster	Souleymane Doucouré (Neuchâtel)
9.9.2011	Best talk	Maike Massierer (Basel)
9.9.2011	Best talk	Immanuel Stampfli (Basel)
9.9.2011	Best poster	Lev Kiwi (Fribourg)

# Swiss Doctoral Program in Mathematics

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## Job openings

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### Current Academic Job Announcements in Switzerland

- EPF Lausanne: [Faculty Position in Analysis](#)
- University of Neuchâtel: [Full professor position in Applied Mathematics](#)
- University of Basel: [PhD and Postdoc positions](#) (Workgroup of Gianluca Crippa)
- ETH Zürich: [Professor of Mathematics](#)

### Teaching in Switzerland

- Kantonsschule Reussbühl: [Stellvertretung 7. 11. - 2. 12. 2011](#)
- Kantonsschule Baden: [Kleines Pensum in Mathematik ab August, Stellvertretung im September 2011](#)
- Freies Gymnasium Bern: [Pensen in Mathematik, Angewandte Mathematik, Physik ab August 2011](#)
- Kantonsschule am Brühl, St. Gallen: [Stellen in Mathematik/Physik und Informatik ab 15. August 2011](#)
- Kantonsschule Bülach: [Stellvertretungen in Mathematik ab 24. Oktober 2011](#)
- [Öffentliche Ausschreibungen in der Schweiz](#)

### Positions in Europe

- Université de Strasbourg: [24 months Post-doctoral position in Mathematics](#)
- Portugal and US: [ICTI CMU-Portugal Ph.D. and Postdoctoral Fellowship in Applied Mathematics, Carnegie Mellon University](#)

### Positions in the US

- Portugal and US: [ICTI CMU-Portugal Ph.D. and Postdoctoral Fellowship in Applied Mathematics, Carnegie Mellon University](#)
- [CMU Tenure track position in Applied Analysis, Carnegie Mellon University](#)

### Permanent Math Job Pages in Switzerland

- [University of Basel](#)
- [University of Fribourg](#)
- [University of Genève](#)
- [ETH Zürich](#)
- [Seminar Angewandte Mathematik, ETHZ](#)
- [Institute for Operations Research, ETHZ](#)

- [University of Zürich](#)

## General Math Job Pages

- [myScience.ch](#)
- Luchsinger's Job Pages: [Switzerland](#), [worldwide](#)
- [EuroScienceJobs](#)
- [Careerjet](#)
- [Career.edu](#)
- [Euro-Math-Job](#)
- [Stellenbörse Mathematik](#)
- [SIAM Job Page](#)
- [The Statistics and Mathematics career source](#)
- [Data Shaping Solutions - Job search](#)
- [Data Shaping Solutions - Resumes](#)
- [jobrapido](#)
- [Renego](#)
- [JOBkralle](#)

## Mathematicians and Statisticians

... and their way to professional independence:

- an essay of [Dr. C.J. Luchsinger](#).

# **Swiss Doctoral Program in Mathematics**

*Universities of Basel, Bern, Fribourg, Geneva, Neuchâtel, and EPF Lausanne*

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## **Grants**

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- [Swiss National Science Foundation](#)
- European Grants
  - [Erasmus Mundus scholarships](#)
  - [General FP7](#)
  - [CORDIS FP7](#)
  - [CORDIS FP7 Ideas](#)
  - [ERC Starting Independent Research Grant \(pdf\)](#)
  - [Find a call](#) (there, click on *Ideas: 2006-12-22: ERC-2007-StG*)

# **Swiss Doctoral Program in Mathematics**

*Universities of Basel, Bern, Fribourg, Geneva, Neuchâtel, and EPF Lausanne*

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## **Traineeships**

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- **IASTE** is an organization for the **exchange of students** at higher education institutions wishing to obtain **practical experience abroad**. **Companies**, on the other hand, who are interested to **offer traineeships** benefit from the worldwide IASTE network. The service is free of charge for the employers.

# **Swiss Doctoral Program in Mathematics**

*Universities of Basel, Bern, Fribourg, Geneva, Neuchâtel, and EPF Lausanne*

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## **Documents**

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This is a repository for documents of general interest. To post such a document, please send it to [Bruno.Colbois@unine.ch](mailto:Bruno.Colbois@unine.ch).

- [How to write your first article](#) (Steven G. Krantz)
- [How to Give a Good Colloquium](#) (John E. McCarthy)
- [Instructions for typesetting a poster](#)
- What is a doctorate? The position of the CRUS: [deutsch](#), [français](#)

# Swiss Doctoral Program in Mathematics

Universities of Basel, Bern, Fribourg, Geneva, Neuchâtel, and EPF Lausanne

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## History of the *Troisième cycle Romand de mathématiques*

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### General

Please see the [article of Claude Weber](#) on the history of the *Troisième cycle*. The text has been written on the occasion of the centennial of the Swiss Mathematical Society in 2010. It is published in this archive with the friendly permission of the [EMS Publishing House](#).

### Presidents of the *Troisième cycle*

- 1969-1972 [Georges de Rham](#), Uni Lausanne
- 1973-1994 [Michel Kervaire](#), Uni Geneva
- 1995-2002 Alain Valette, Uni Neuchâtel
- 2003-2007 Olivier Besson, Uni Neuchâtel
- 2008-2009 Norbert Hungerbühler, Uni Fribourg

The *Troisième cycle Romand de mathématiques* has been merged with the *Swiss Doctoral Program in Mathematics* by the end of 2009.

### Annual reports of the *Troisième cycle*

- [1969-70](#)
- [1970-71](#)
- [1971-72](#)
- [1972-73](#)
- [1973-74](#)
- [1974-75](#)
- [1975-76](#)
- [1976-77](#)
- [1977-78](#)
- [General remarks 1978](#)
- [1978-79](#)
- [1979-80](#)
- [1980-81](#)
- [1981-82](#)
- [1982-83](#)
- [1983-84](#)
- [1984-85](#)
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- [General remarks 2006](#)
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