

Graduiertenkollegs

**The Deutsche Forschungsgemeinschaft's
Research Training Programme**

DFG

A *Graduiertenkolleg* is a university graduate training programme established at a centre of scientific excellence in a specific field. It encompasses 15-25 PhD students and 8-15 senior scientists at a single university or, in a few cases, a small group of neighbouring universities. The students work on their theses within the framework of a coherent and often interdisciplinary research programme; they participate in an accompanying study programme organised by the senior scientists and to some extent by the students themselves.

The programme was established in 1990 to improve the quality of doctoral training in Germany. It has now reached its projected size of some 300 *Graduiertenkollegs* active in all areas of Science and the Humanities.

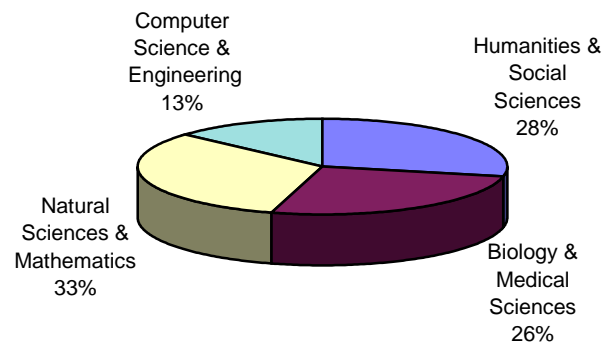


Diagramme: *Graduiertenkollegs* by main subject areas

A listing of all *Graduiertenkollegs* (with links to their websites) and further information on the programme can be found on our website:

<http://www.dfg.de/foerder/grako/liste.html>

Selection and Evaluation

Proposals for new *Graduiertenkollegs* are initiated by faculty members and endorsed by their university. They are evaluated and selected in a competitive central peer review procedure based on the following criteria:

- qualification of the proposing researchers for research and research training.
- quality of the proposed research programme
- suitability of the study programme.

Funding

Successful proposals receive an average grant of 700.000 Euro for three years, which can be renewed twice. Thus, a *Graduiertenkolleg's* maximum duration is nine years. This ensures that there is always room for new proposals and new subjects in the programme.

Funding includes:

- Fellowships for PhD students and some postdocs
- Research materials and travel funds for students
- Workshops, excursions, etc. and a visiting scientist programme
- Coordination costs.

Results

The programme has been successful in many respects. Universities have adopted it as a measure towards building a research and teaching profile and give their *Graduiertenkollegs* special support. Some have already established them as a starting point for broader and more permanent Graduate School-type structures, partly in an effort to attract foreign students. The Federal States' Governments are also beginning to incorporate the idea in their guidelines for research training.

Graduiertenkollegs have proven a successful approach to new forms of cooperation in PhD training: between disciplines in *Graduiertenkollegs* on interdisciplinary subjects, between dispersed locations in a „virtual“ *Graduiertenkolleg*, and between university and industry. They have also developed into a flexible and dynamic instrument of international cooperation in graduate training.

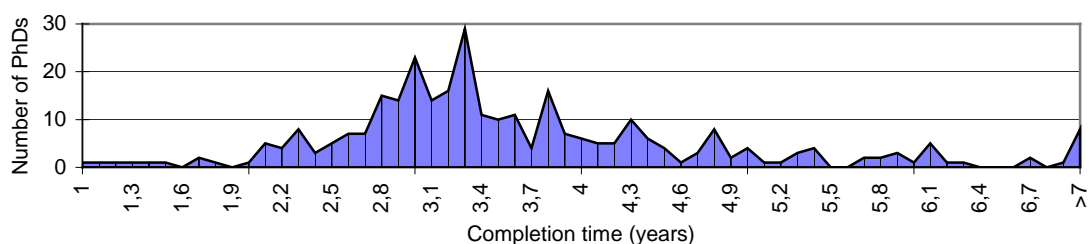
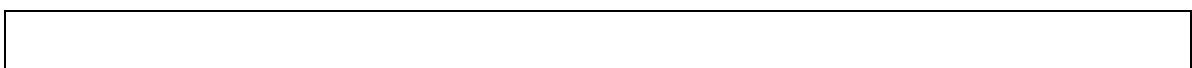


Diagramme: Completion times for PhDs in *Graduiertenkollegs*

They have also been successful in reducing the average time spent to complete a dissertation, the average age of PhDs, and promoting women in science. The additional transferable skills (e.g. cooperative and interdisciplinary experience) acquired by PhDs through *Graduiertenkollegs* are appreciated by industrial employers.



The Research Programme

A *Graduiertenkolleg*'s research programme provides a framework into which the individual theses can be fitted in accordance with the qualifications and wishes of candidates and faculty members. This programme is expected to meet high scientific standards. In addition, it is required to be sufficiently broad, interdisciplinary if possible, enabling the students to acquire expertise in fields outside their own. Because the scientific interaction and cooperation between the participating students is one of the essential advantages of a *Graduiertenkolleg*, the programme must be focussed enough to ensure that the individual theses are sufficiently closely linked to facilitate this exchange.

The Study Programme

An accompanying programme of coursework, seminars, lab courses, excursions, etc., the study programme has to strike a sensitive balance between overloading the curriculum and offering too little guidance for the students. It aims to:

- provide PhDs with a broad methodical orientation and complement individual specialities, providing a broader understanding of the thesis' subject area and context,
- provide a common basis of skills and knowledge for graduates from different disciplines,
- encourage mobility and visibility/participation in activities of the scientific community,
- structure cooperation of graduates and their participation in the management of the *Graduiertenkolleg*,
- enable the acquisition of transferable skills and competence,
- monitor students' progress.

A good study programme provides an ideal focus for involving the students in the organisation and planning of the *Graduiertenkolleg*. The initiative taken by students in many *Graduiertenkollegs* is remarkable, ranging up to the organisation of conferences and a significant participation in the implementation of the visiting scientists programme, etc.

An example: The Graduiertenkolleg Optoelectronics of mesoscopic semiconductors, Marburg

<http://www.physik.uni-marburg.de/hlo/gkwww-e.html>

8 senior researchers (6 physicists, 2 chemists) and up to 30 graduate students work together in this Graduiertenkolleg which was established in 1993. The theses centre on the following topics in the research programme:

- *Polymers and Liquid Crystals*
- *Optoelectronics of multiple structures*
- *Nonlinear optics in semiconductors, semiconductor structures and polymers*
- *Microresonators*
- *Optoelectronic devices*
- *Semiconductor optics on scales below the relevant wavelength of light*
- *Manufacture of semiconductor heterostructures*

The study programme contains a range of events

- *Lecture series (2 hrs/week)*
This is intended to provide a common base of knowledge for the students. The subjects change regularly, the emphasis being on experimental and theoretical semiconductor physics and optics, polymer physics, preparation technology and applications.
- *Annual block seminar*
This is organised yearly by two students of the Graduiertenkolleg over 3-4 days. All students report on the progress of their theses, the evenings are devoted to talks on topics of common interest
- *„Kindergarten“ seminar*
These are organised by the students themselves (without the advisers) in the term holidays. They treat basic scientific questions connected with the theses.
- *Lectures by visiting scientists.*
The Graduiertenkolleg has funds for inviting foreign and national scientists of international stature. They are chosen by the students according to their current scientific interests and problems
- *Workshops*
Twice a year the Graduiertenkolleg organises a workshop of several days' duration. They are devoted to a single topic, on which scientists from other institutions are asked to give short courses of high didactical standards

International Cooperation in *Graduiertenkollegs*

Foreign students are welcome in *Graduiertenkollegs*. 13% of the PhD students and 25% of the postdocs funded by the DFG in *Graduiertenkollegs* have a nationality other than German and many more students from abroad with other sources of funding participate in *Graduiertenkollegs*.

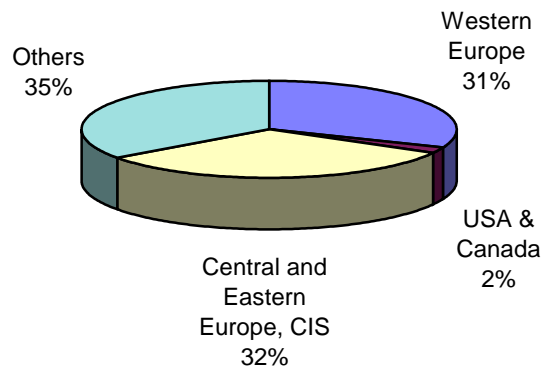


Diagramme: Home Countries of Foreign Students in *Graduiertenkollegs*.

Graduiertenkollegs are actively involved in international cooperation and exchange. Every student can expect to travel abroad to a conference, etc., at least once in the course of his/her doctoral studies; 25% stay for periods of 2 weeks or longer.

European *Graduiertenkollegs*

A group of scientists at a German university that wishes to train graduate students in a certain field jointly with colleagues elsewhere in Europe^{*)} may be supported as a European *Graduiertenkolleg*.

Here both partners join forces in offering a research and study programme along the lines described above for doctoral students at both universities. The study programme should include a 6-12 month mobility period at the partner university for each doctoral student. Since the DFG can fund only the German part of the proposal, complementary funding at the partner university must be provided by national sources. Besides funding for the participating doctoral students, this should include a fair share of the mobility costs and the waiving of fees for visiting students from Germany (there are no tuition fees at German universities).

This scheme has also been extended to joint research training ventures with overseas partners.

Joining a *Graduiertenkolleg*

^{*)} All countries in Europe (not only the EU) and Israel

Participation in a *Graduiertenkollegs* is open to highly qualified students of all nationalities. The *Graduiertenkollegs* award fellowships to doctoral students; they are required to advertise them nationally and encouraged to attract students from abroad. Self-funding PhD students are welcome if they fulfil the criteria for admission to the programme. There are no fees.

Students are chosen from the candidates by the *Graduiertenkollegs* themselves according to their respective procedures. Therefore, applications for a fellowship must be addressed to the individual *Graduiertenkolleg* selected by the candidate according to her/his interests. Details of open positions can often be found on the internet.

Candidates are expected to

- hold a university degree recognised in Germany with well above-average qualifications,
- present a substantial thesis topic that fits well into the research programme; a member of the *Graduiertenkolleg* must have agreed to participate in the supervision of the thesis,
- be under 28 years of age.

Fellowships can be awarded for up to three years.

Women in Science

One of the aims of the *Graduiertenkollegs* programme is to promote the participation of women in science. There is a provision for part-time fellowships and a special supplement for child care.

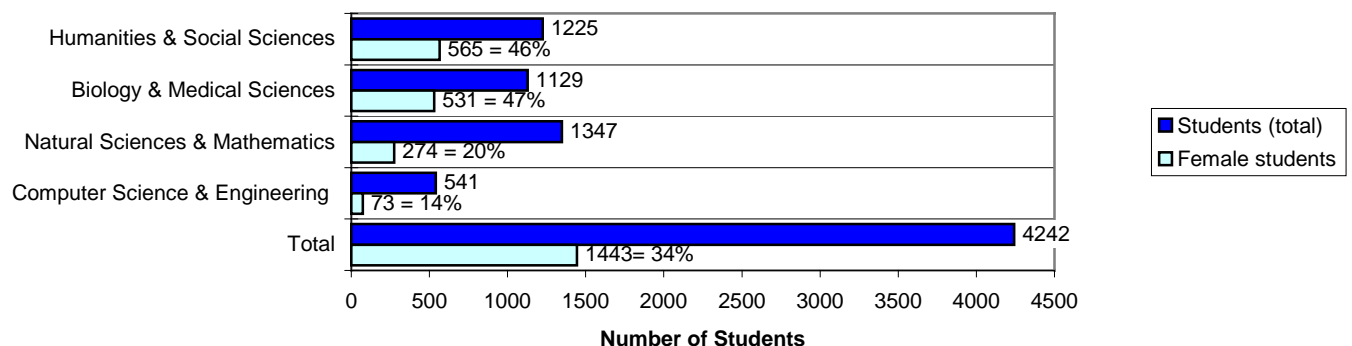


Diagramme: Participation of female students in *Graduiertenkollegs*

Geographical Distribution of Graduiertenkollegs

(By Federal States)

Deutsche Forschungsgemeinschaft

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DFG