

SFB 1176
„Molecular structuring of soft matter“

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Guideline: Graduate School in the SFB 1176

This guide should provide an overview about the measures and offers of the graduate school as well for Ph.D. Students, but also for projects leaders (also called Personal Investigators, PI). Normally, chapter 1 already gives the necessary information, in case of more detailed questions please refer to the additional chapters.

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1 Overview over the Graduate School

1.1 What is the integrated Graduate School?

The Graduate School MGK (German abbreviation of "Modul GraduiertenKolleg") is an integral part of the DFG-funded Collaborative Research Program SFB 1176 "Molecular Structuring of Soft Matter". Its purpose is to provide a learning environment for doctoral students, aiding them in their personal development towards becoming active scientists. It brings together international and interdisciplinary working doctoral students and postdocs of 11 different research groups, 20+ project leaders and other researchers working in the SFB 1176. It also integrates interested doctoral students from outside of the SFB whose thesis topic is related to the theme of the SFB.

1.2 What is the aim of the Graduate School?

With its structured Doctoral Program for advanced training the Graduate school supports the development of an individual research profile of the doctoral students and improves their career opportunities. The members will highly benefit from the interdisciplinary training in polymer science and wide-ranging expertise including interdisciplinary qualifications.

To document this exceptional qualification, every participant will receive a certification about all courses they have successfully attended.



Fig. 1: Members of the graduate school will be trained for many different skills to achieve excellent opportunities in both research and industrial careers.

1.3 What is necessary for the Graduate School concept to work?

Several elements are essential:

- the individual research on the given thesis topic, which is in the focus of attention
- the support of the work group in which the doctoral student is embedded, with close interactions to the group leader as well as progress reports, journal clubs/literature seminars, discussions with the fellow group members (research or internal training within the individual field of research)
- The mentor who is given additional support to doctoral student

- The structured interdisciplinary (or “external”) training program of the Graduate. Based on the students Personal Qualification Plan (PQP) that is defined in the first TAC-Meeting, students will benefit from scientific and additional qualifications, training, and networking. To establish the milestones in research as well as additional training during the thesis, students are required to plan and think ahead. For documentation and to aid this process they set up an individual research and training plan
- A formal doctoral agreement specifies the rights and duties of the doctoral student, its supervisor and mentor and is signed by all of them
- Support in special personal situations: If necessary, the Graduate School will also give financial or organizational help, e.g. for expectant mother or scientists responsible for small children

1.4 How does the mentoring work?

At the start of a thesis, every student will fill in and sign a doctoral agreement. In this document, an additional Project Leader (or Personal Investigator, PI) will be defined who give additional advice to the doctoral student. This person should be scientific independent but somewhat familiar with the research topic, to allow for independent scientific feedback. In addition, a mentor who is advising the students in every day’s problems, but also in the scientific work, is chosen from the supervisor and the doctoral student together. The mentor is typically a post doc or a Ph.D. student in the last year.

1.5 Personal Qualification Plan

In addition, the student and his supervisor will develop a **Personal Qualification Plan (PQP)** where the goals of the thesis, but also additional training programs, including scientific qualification, generic competences and soft skills. This plan should be **updated at least once a year** by the doctoral student and his supervisor. Also the TAC committee will discuss the personal qualification plan.

The personal qualification plan together with the mentoring will provide a framework to the student to reflect, plan and allocate the milestones and time during their thesis.

1.6 Membership in the Graduate School

Doctoral students as well as postdocs working on projects included in the SFB 1176 are automatically members of the Graduate School. In addition, every Ph.D. student and post doc has to be a member of the Karlsruhe House of Young Scientists (KHYS) to ensure a high degree of networking across different scientific areas.

In addition, interested doctoral students or post-docs with topically related projects from the areas of physics and chemistry of soft materials working at institutes participating in the SFB 1176 can apply for membership. In this case, please contact the speaker (Prof. M. Wilhelm) of the graduate school.

1.7 What is the graduate School program made off?

Core or signature activities of the SFB 1176: the SFB Seminar, regular doctoral student seminars with progress reports and workshops.

In addition, there will be additional courses or workshops focusing on scientific and personal skill development, language and intercultural training. For the scientific qualification, there will be Advanced Training Modules (ATM): blocked, sometimes methods-oriented courses addressing specific research topics. Also lectures or modules from the official course curriculum at KIT can be used for this purpose.

2 Summarization of the support measures in the Graduate School and the SFB 1176

The aim of the Graduate school is the development of an individual research profile of the doctoral students and the improvement of their career opportunities. The members will highly benefit from the interdisciplinary training in polymer science and wide-ranging expertise including interdisciplinary qualifications.

Therefore, the graduate school combines measures in different areas: The main part is a high scientific education resulting in special expertise knowledge about the field of the individual thesis, but also a wide ranging expertise in polymer science. The scientific education will be combined with additional qualification focusing on generic competences and soft skills. To support the progress of the thesis, the graduate school will perform supervision and mentoring measures. As a last point, support in special personal situations is possible. This should guaranteed the progress of the scientific work independent of the specific personal situation.

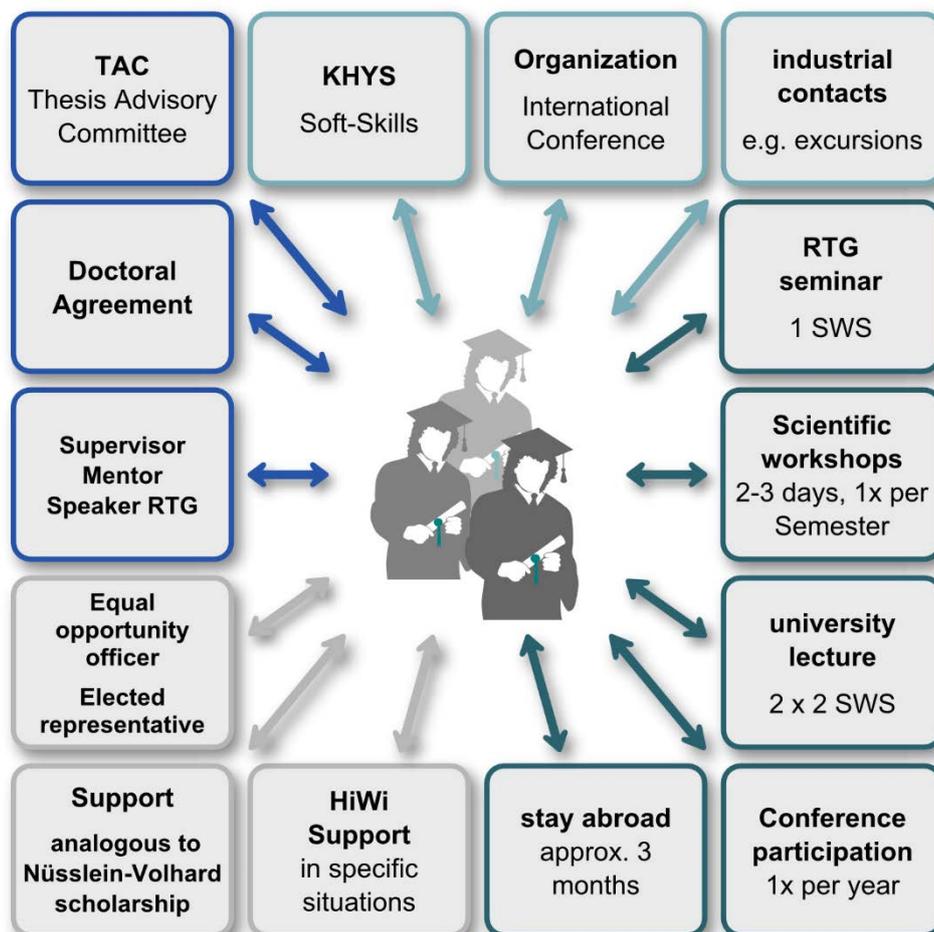


Fig. 2: Summarization of support measures: The Graduate schools combines scientific qualification (dark green), soft skills (light green) with supervision measures (blue) and support in different situations (grey).

In the following paragraphs, all measures will be explained in more detail.

3 Qualification concept of the graduate school

All qualification measures of the graduate school are summarized in the following table and explained in detail in the following paragraphs. They combine compulsory and optional measures. Every member of the Graduate School will receive a certification including all qualification courses he/she attended successfully.

Qualification measures for Ph.D. students

- **Personal Qualifikation Plan (PGP)**
 - Scientific and generic qualification using offers of the SFB 1176 and/or the
- **Compulsory elements**
 - SFB Seminar (1 SWS), organized by the members of the Graduate School and the PIs of the SFB
 - Progress reports: Every member has to give at least one report per year
 - Training by attending university lectures (at least 4 SWS) in a Ph.D. thesis
 - Graduate workshop, 2-3 day's every semester
 - Seminar and report language is English
 - At least one self-written publication in a peer reviewed journal. Normally, two or three publication are expected, one publication will be accepted only in justified cases.
 - Conference participation (active participation, e.g. talk or poster). Goal are 2-3 participations during one thesis, minimum (in justified cases) is one.
- **Desired, optional elements**
 - Excursions (offered every semester)
 - Stays abroad (approx. 3 months)
 - Training in independent scientific work, generic competences and soft skills offered by the Karlsruhe House of Young Scientists (KHYS)
 - Training of Management skills: Guidance of scientific assistants and pre-graduate student projects
 - Organization of an international conference of the SFB assisted by the members of the Graduate School.

Differences for post-doctoral fellows

- No compulsory lectures, if not included in the personal qualification plan
- Assignment as mentor: Guidance of Ph.D. students

Table 1: Summarization of the qualification concept of the graduate School in the SFB 1176

3.1 Measures for scientific qualification

3.1.1 University lectures

The lectures offered in the SFB 1176 are a combination of lectures or modules from the official course curriculum at KIT and SFB-specific Advanced Training Modules (ATM). The latter one are usually offered in blocked courses or workshops. Examples are special education lectures of associated members of the SFB or method-oriented courses.

For normal Ph.D. students 4 SWS of lecture during their thesis are compulsory. The student and the supervisor decided together which topic is most useful for the thesis and the scientific education of the respective student. This choice has to be fixed in the personal qualification plan. For post-doctoral fellows there is no need to follow lectures, but of course

also postdocs should attend lectures if needed, especially when they are working in a new topic. In this cases, this should also be set down in written form in the personal qualification plan.

The lectures offered can be divided in different areas relevant for the SFB 1176 shown in the following diagram. The focus for all members of the SFB 1176 is the science of soft matter, every student or post doc should have at least basic knowledge in polymer science independent on the project he is working on.

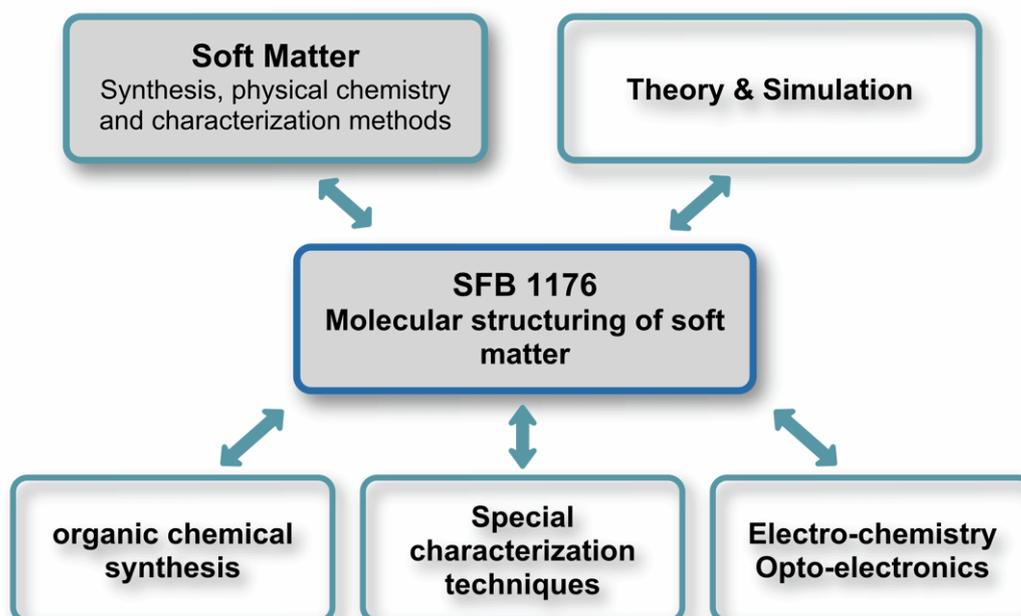


Fig. 3: lecturing fields in the SFB 1176

The actual list of off all possible lectures can be found on the webpage of the Graduate School. If you have additional suggestions of useful lecture offers, please feel free to send them to the Manager of the SFB.

If a lecture could not be offered in English in the semester wanted by the student, there is also the possibility that a student acquires the according knowledge on his own followed by a short examination through the lecturer. This could apply when the lecture is not offered in one year at all or, for non-german students, if it is not offered in English language. In these cases the lecturer should define the chapters from text-books if there is no English script available.

3.1.2 SFB Seminar

In the SFB Seminar, the members of the graduate school can, on one side, train their presentation skills with progress reports. On the other side, they will receive a wide expertise over the research done in the SFB itself and in polymer science in general.

Every member of the graduate school has to give a progress report at least once a year, either in the seminar or in a special graduate workshop. In addition, excellent scientist in the field of soft matter will be invited to guarantee an actual knowledge about the research fields in the SFB. The members of the graduate school are encouraged to suggest possible guests for the seminar.

In addition, the members of the graduate school are invited to perform informal meetings after the seminar or join the group meetings of the speaker of the Graduate School, Prof. Wilhelm. These measure should promote a good group dynamic in the Graduate School and, in addition, offer a possibility to communicate problems in an easy, informal way.

3.1.3 Work-Shop of the Graduate School

Every semester, a workshop for all members of the Graduate School will take place. They will extend over 2-3 days and are normally placed outside the KIT to promote social contacts between the members.

These workshops will be used for progress reports, but also for blocked training of special knowledge, e.g. for characterization methods. Another other topic are Inhouse-Training courses of the Karlsruhe House of Young Scientists (KHYS) for generic competences and soft skills.

In addition, a methodic workshop organized by the members is planned where the different scientific disciplines explain their methods to the other groups. Examples are synthesis for engineers of simulation techniques for chemists. This workshop will train the teaching capabilities, but also the interdisciplinary education of the members of the graduate School.

3.1.4 Publications

Scientific publications in peer-reviewed journals are essential for a Ph.D. thesis and for scientific work in general. Therefore it is required that every member of the graduate School is able to write a scientific article by himself. During his thesis, every member of the graduate school has to write scientific articles about his research work. Intended are 2-3 articles during every Ph.D. thesis. In justified cases, exceptions of this general aim can be approved by the executive board of the SFB. In every case, the minimum for a Ph.D. thesis is at least one article.

3.2 Measures for international networking

3.2.1 Conference participation

The presentation of scientific results is one of the key competences for a career in science, but is also required industry. Therefore, every member of the Graduate School has to present his results at international conferences. Expected are 2-3 participations, the minimum of one presentation is compulsory. The presentation can be a poster or a talk, without a presentation financial support of the participation is not possible.

In addition to the training of the presentation skills, the members of the Graduate School have the chance to get known in the scientific community. Also, the visibility of the SFB in the international community is improved.

3.2.2 Stay abroad

Experience abroad is an important factor for the personal development of the members of the Graduate School and it is a possibility to establish contacts in scientific community. In addition, the SFB will benefit if the students gain export knowledge from excellent international research groups.

The SFB support one stay abroad for every Ph.D. Student with duration of approx. 3 months. This support can be either help by writing applications for scholarship (KYHS at the KIT or external, e.g. DAAD), but also direct financial support for research cooperation's. The student will receive his regular salary and, in addition, travel and accommodation costs from the central funds of the SFB.

3.3 Measures for generic competences and career development methods

3.3.1 Training seminars

One element of networking and general training at the KIT is the Karlsruhe House of Young Scientists (KYHS). The training seminars can promote scientific competence (e.g. scientific writing or presentation), but also generic competences like time management, project management or application strategies. In addition, language courses in different levels can be attended.

Every member of the Graduate School is also member of the KHYS. Therefore he can participate individually at the courses of the KHYS. In addition, the SFB will offer in cooperation with the KHYS inhouse trainings especially for members of the Graduate School, either at the KIT or externally during the graduate workshop.

It is expected from every member of the graduate school that he will attend some of the courses of KHYS. Planned and attend courses should be documented in the personal qualification plan.

3.3.2 Management skills, teaching skills and soft skills

Management skills, teaching skills and soft skills are essential for later career options. Management skills are trained in the SFB through the integration of research assistants and pre-graduate student works in the research projects.

Support of foreign members of the SFB, also in every day live results in the development of soft skills and, in addition, contribute to the networking of the members of the SFB. Other examples are exchange students or qualification scholars in the SFB.

Teaching skills are essential for a future career in science. Therefore, every Ph.D. Student is integrated in the university teaching in a low degree as defined in promotion regulation of the relevant faculty, e.g. by supervision in practical courses. Post-doctoral students will act as mentors to pass on their knowledge and experience to Ph.D. students.

3.3.3 International conference

The SFB 1176 will organize an international conference once in a funding period. Members from the Graduate School will be integrated in the organization of this conference resulting in first insights in the organizational structure of scientific conferences.

3.3.4 Contact to industries

Contacts to industry are one element of the networking in the SFB. They will be realized by excursion to industry, but also invitation of industrial people to the seminar or to workshops of the graduate school.

The Members of the Graduate School are encouraged to make suggestions for appropriate excursions or relevant seminar invitations.

4 Supervision concept in the Graduate School

As already mentioned, the Graduate School combines measures from different perspectives: Scientific training, generic competences, supervision and mentoring and support in special personal situations. This should guarantee the progress of the scientific work independent of the specific personal situation. Here, you will find the supervision and mentoring concept in more detail.

Due to the detailed mentoring and supervision concept, every member of the Graduate School will have several contact persons simplifying discussions of possible problems in scientific or in supervision questions. Additional contact persons in case of problems or general suggestions are the speaker of the Graduate School and the equal opportunity officer and the elected student representative of the SFB 1176.

4.1 Doctoral agreement

A formal doctoral agreement (German: Promotionsvereinbarung) specifies the rights and duties of the doctoral student, its supervisor and mentor and is signed by all of them. In addition, an additional PI is defined who takes part in the TAC-Meetings (see 4.4).

4.2 Supervisor and mentor

Every Ph.D. student will have a direct supervisor who will also be first referee of the thesis and a second referee. In case the direct supervisor is not habilitated, there will be also a third referee. The supervisor guarantees sufficient scientific mentoring and advice and an appropriate correction time of the thesis (see doctoral agreement).

In addition, every Ph.D. student is assisted by a mentor in every day problems like lab work or planning a thesis in general. A post-doctoral student working in the SFB or in a SFB associated working group will pass his experience to the Ph.D. as a mentor.

4.3 Personal Qualification Plan

The student and his supervisor will develop a **Personal Qualification Plan** (PQP) where the goals of the thesis, but also additional training programs, including scientific qualification, generic competences and soft skills. This plan will be

discussed by the TAC-Committee during the first TAC-Meeting. Afterwards, the plan should be **updated at least once a year** by the doctoral student and his supervisor.

The personal qualification plan together with the mentoring will provide a framework to the student to reflect, plan and allocate the milestones and time during their thesis.

The mandatory form for the Personal qualification plan (PQP) is available on the Webpage of the Graduate School and contains also notes for planned or already realized publications or conference participation. The plan should be regularly updated. All the PQPs have to be collected centrally by the SFB, so please send the actual version to the manager of the SFB after every change.

4.4 Thesis advisory committee (TAC)

The Thesis Advisory Committee (TAC) has two main functions: to judge and promote the scientific progress of the thesis and to offer a forum for discussion in case of problems between supervisor and student. Members are the first supervisor, the mentor and a second project leader which normally will be the second referee of the thesis. In addition, the speaker of the Graduate School and the equal opportunity officer will be invited to join the TAC-Meetings.

More details you can find in the TAC-Guidelines on the Webpage of the SFB.

4.5 Elected student representative

Every year, all members of the Graduate School will elect a student representative. This person acts as a contact partner in case of problems and is a voting member of the SFB membership meeting. He approves the managing board in questions concerning Ph.D. students.

5 Internationalization of the Graduate School

Internationalization is one of the main goals of the Graduate School which means that the members will be qualified to perform scientific research on international standards. Also measures for networking in the international scientific community are integrated in the Graduate School.

Therefore, measures like stay abroad of students or exchange programs with international working research groups are supported in the SFB, see chapter 3 “Qualification concept”. Another aspect is the participation at conferences also discussed there.

In addition, the recruiting procedure should reflect the requirements of internationalization. Therefore, job adverts should be placed over international acting platforms, e.g. “academics.com” or “unijobs.com”. as the suitability and the qualification of foreign students is normally harder to judge than in the case of locally students, the Graduate School includes two measures to encourage project leaders to invite and integrate foreign students.

5.1 Personal job interviews

This measure offers a project leader the possibility to check promising candidates easily. The Graduate School will finance a personal job interview, e.g. travel costs and accommodation for one up to two weeks. This measure allows the project leader to get a profound impression of the respective candidate. The job interview has to be executed from at least two project leaders.

5.2 Short time scholarships

Another way to check the suitability of a candidate is the short time scholarship. The SFB managing board can give a scholarship to a foreign student so that he can work in a SFB-Project for a short time showing his qualifications and working abilities. The duration of a scholarship is approximately three months, the student will receive travel costs and a fixed financial support every month that includes accommodation and living costs.