



# SFB/TRANSREGIO 49

FRANKFURT-KAISERSLAUTERN-MAINZ

CONDENSED MATTER SYSTEMS WITH VARIABLE MANY-BODY INTERACTIONS

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COLLEGE FOR THE  
ADVANCEMENT OF POSTGRADUATE EDUCATION

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# TRAINING MANUAL

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### CONTACT INFORMATION:

COLLEGE FOR THE ADVANCEMENT OF POSTGRADUATE EDUCATION

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<http://www.tr49.de>

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#### **Executive Manager:**

**Priv.-Doz. Dr. Axel Pelster**

axel.pelster@physik.uni-kl.de

Department of Physics, Technische Universität Kaiserslautern

Telephone 0631-205-2270

#### **College Coordinator:**

**Prof. Dr. Sebastian Eggert**

eggert@physik.uni-kl.de

Department of Physics, Technische Universität Kaiserslautern

Telephone 0631-205-2735



## Overview: Tasks for you to do:

1. Check the central web page regularly to obtain necessary information about events and sign up for the email list at [https://th.physik.uni-frankfurt.de/mailman/listinfo/tr49\\_college](https://th.physik.uni-frankfurt.de/mailman/listinfo/tr49_college)
2. Initiate and account for your mentoring team (see page 10).
3. Actively participate in the student workshops, the scientific workshop and benefit from other available resources.
4. Feel free to ask for help any time and provide feedback to the Executive Manager to ameliorate the organization of the college.



## Introduction and philosophy

Welcome to the integrated *College for the Advancement of Postgraduate Education*<sup>1</sup> of the SFB/Transregio 49 (Frankfurt-Kaiserslautern-Mainz) “Condensed Matter Systems with Variable Many-Body Interactions”.

You receive this manual as a doctoral student in the Transregio, but much of the contents are also relevant for diploma students, postdocs, and supervisors.

The *College for the Advancement of Postgraduate Education* is an integrated graduate school with the primary goal of improving and furthering the education of young researchers affiliated with the research projects of the Transregio. Admission to the College is granted upon informal nomination through a senior research member of the SFB/Transregio 49.

This document describes the possibilities, structures, and educational elements that are offered by the College. The purpose of the manual is to help you draw benefits from the services and training opportunities to the fullest extent. However, it is not a comprehensive document about all educational possibilities at the Transregio sites and neither does it cover any legal aspects concerning the program.

As a doctoral student your primary focus is most likely on producing good research results and writing an excellent thesis. To this end, the College will provide you with training opportunities, guidance, and a pleasant networking environment in order to assist your research

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<sup>1</sup> In German the College is referred to as **Modul Graduiertenkolleg (MGK)**



progress towards graduation without delays. The College will also assist you in acquiring a variety of other skills that are expected from a doctoral candidate on your way to becoming a self-reliant researcher, who not only excels in science, but is also ready to fill the position of a leading, responsible and independent scientist as demanded in all parts of society. The combination of an efficient training environment provided by the College together with the first-class research opportunities in the SFB/Transregio 49 is going to help you in producing better results and reaching your personal goals more quickly.

The College will offer many *customized* and *transregional* training opportunities, such as workshops, seminars, soft skill courses, lecture series, exchanges, books, excursions, information services, and – last but not least – personal career development and guidance. *Customized* means in particular that the educational events are tailored according to your needs. Of course, this implies in turn that you have to be involved actively in order to suggest, plan, and guide these events, in collaboration with your fellow students, your supervisor, and the Executive Manager of the College. *Transregional* means that activities can be offered and attended at all three locations of the Transregio. Therefore, you will profit from networking among the different locations and from scientific communication tailored to your needs.

Naturally, the success of the training possibilities will depend strongly on your own contribution and input.

Apart from educational activities, your personal career development and research progress is an important issue of the College. A mentoring team will be assigned to you, which consists of your thesis advisor and up to two senior researchers from other research



groups at any location of the Transregio. This team will become a valuable resource for you by providing you the advice and experience from senior scientists. Regular meetings with the team will assist you in making efficient progress in achieving your own research and educational goals. For this purpose, a customized career development plan will be set up for you, adapted to your specific profile, which will enable you to identify your needs, define your goals, and track your progress efficiently.

Another aim of the College is to set up a research and training environment which is as pleasant and productive as possible. For successful research, opportunities for people exchange between labs must exist, required literature must be provided, and coordinated conference travel should enhance the visibility of your research and provide stimulating contacts to external experts.

The implementation of these goals in practice requires a structure of persons and services in the College, which will be outlined in the remainder of this manual.



## Structure

The infrastructure of the College is designed to provide quick communication in order to realize your ideas and needs in an easy and straight-forward manner. In addition to centralized information services, the College contains a network of people who can assist you in your research and training. The following list describes the roles of the people who are most central to achieving your goals.

### You

Your own motivation and talents are the most important ingredients for successful doctoral studies. The College and all of its activities need inspiration, input, and active contribution from you and your fellow students! For all events you participate in, your feedback is important and expected. Moreover, whenever you feel an action is required, an event inevitable or training needed, it is in the end up to you to take the initiative, stimulate, and organize. The persons listed below will support and assist you.

### Student coordinators

Self-organized student activities are the core ingredient of the College philosophy. Everyone is (this means: you are) encouraged to get active and initiate events. In addition a student coordinator is elected at each Transregio location who speaks for the member students at the site.

The student coordinator will be responsible for the smooth organization of the student seminars and is expected to collaborate



closely with the Executive Manager. He/she will also be a partner for his/her fellow students to address regarding affairs concerning the College. Of course, he/she may seek advice at any time from the Executive Manager (see below).

## Supervisor

Your supervisor is your direct scientific advisor. He/she guides and assists you in your everyday research and will also suggest College activities for you to join. If you need guidance or encounter a problem, your supervisor will in most cases be the first choice of a person to talk to. He/she will more than likely appreciate it if you propose a new idea or request additional training.

## Mentoring team

Mentoring is a central ingredient of the College philosophy. You will therefore be assisted by a mentoring team which consists of your supervisor and up to two senior researchers from other research groups.

At the time of your employment, your supervisor may have introduced you to your mentoring team already. If this has not happened yet, you should discuss who should join the mentoring team with your supervisor and then inform the Executive Manager of who the members are. If you have any doubt about the intention of forming a mentoring team or encounter problems to approach a second mentor, please ask the Executive Manager for help.

The mentoring team provides you directly with additional networking opportunities outside your group. You should feel comfortable to approach any member of the team as needed. The



contents of the mentoring program will be explained in detail in the following chapter of this manual.

## Executive Manager

Axel Pelster (axel.pelster@physik.uni-kl.de, telephone 0631-205-2270, Technische Universität Kaiserslautern) is the Executive Manager of the College and responsible for all affairs concerning implementation of the program, organization of events, and documentation in collaboration with you and the student coordinators. He can be addressed with suggestions, complaints, and all issues related to the College.

Feedback from you to the Executive Manager is highly encouraged and will always be considered carefully.

The Executive Manager will also serve as an ombudsman, who can be contacted in cases where you wish to discuss a problem first confidentially with a neutral person.

The Executive Manager will maintain a record of College activities and impressions with help and input from you, the student coordinators and the project leaders. He will always stay in close contact with the student coordinators. The Executive Manager will also participate in College activities and visit student seminars and workshops when possible.

A central web page containing useful information is available at: <http://lucky.physik.uni-kl.de/~tr49/mgk>



## College Coordinator

Sebastian Eggert is the College Coordinator and responsible for the structure and contents of the College project MGK within the Transregio. He officially represents the College in external affairs.

The Executive Manager and College Coordinator will actively try to maximize the visibility of the College, thus making exterior feedback possible.



## Services and training

The following services and training opportunities are available in the College.

### Mentoring program

The mentoring team consists of your supervisor and two senior researchers from other research groups and will guide you towards successful completion of your PhD thesis. This guidance includes scientific support, suggestions for further training, and hands-on help when required in your everyday work. In close collaboration with you, the team members will assist you in identifying your strength and talents, finding out which skills you should develop further, and suggest which steps are useful for your career progress. You should feel free to contact any member of your mentoring team when necessary.

At least once per year, the mentoring team is required to meet with you. Both you and your supervisor are responsible for making sure these meetings take place. Of course, you can request additional meetings if necessary, but a meeting is to be held at least once per year. A brief summary of every meeting must be reported to the Executive Manager including time, date, duration, participants and possible feedback.

You should prepare for the team meetings with a short written report about your project and training status and give it to the mentoring team in advance. See the appendix for details about what the report may contain.



In the first meeting, your personal career development plan will be set up. It will include a list of goals and a time plan, which you will establish together with the mentoring team. The career development plan will be helpful in structuring your research activities for the next year and identifying which training and education you should receive according to your abilities and talents. Details and instructions on how to set up the career development plan are given in the appendix. The plan and the reports are internal documents to be used by you for additional guidance. Your supervisor will keep one copy confidentially on file.

In each meeting your career development plan will then be adjusted for the next year. You will also have the opportunity to review your progress together and identify delays, misaligned goals, and required skills to be developed. This does *not* mean that you have to face additional evaluation, but should rather support you in circumventing obstacles that simply may occur. The mentoring team and the career development plan are not intended to control you, but to guarantee an efficient research environment and suitable guidance. For example, in the event that your supervisor is not available for a period of time, the remainder of the team could fill the gap if you have the need to discuss results and problems.

A mentoring team must be assigned to you as a PhD student. If you are a diploma student or postdoc interested in the mentoring program, contact your supervisor.



## Individual career development plan

The career development plan is a central part of the mentoring program. This plan is meant as a guide to efficiently organize the achievement of short-term and mid-term goals and is subject to regular update. Your career development plan and accompanying documentation are intended for your own personal guidance. One copy will be confidentially kept by your supervisor.

The College will provide instructions to aid in structuring the career development plan as outlined in the appendix.

## Student workshops

Every semester a workshop will be organized within the College for all doctoral students and postdocs. One important function of the student workshop is to provide semiformal presentation opportunities for you in front of a more familiar audience. The organizers of the workshop will appreciate suggestions for special topics that might be included in the workshop programme by inviting external speakers. In this sense it is part of your responsibility to influence form and content of the workshop. Help may be requested from the Executive Manager and other senior researchers of the Transregio.

These workshops will also help to establish networking and communication among the students and provide additional opportunities for social interaction.



## Scientific workshops

Building on the success of the student workshops, the Transregio also organizes each second year an international scientific workshop which is geared towards specific topics in methods and research for students. These workshops are open for international registration and the lectures are given by invited experts. Thus, the scientific workshops represent an additional educational measure for the benefit of the students but also for the visibility of the SFB/TR 49 as a whole. The topic of the scientific workshop in 2012 is “Low-dimensional quantum many-body systems”. You are encouraged to participate in these scientific workshops in order to broaden your horizon. Furthermore, if you have any suggestion for the topic of the next scientific workshop, please contact the Executive Manager.

## Annual retreat

There will be a Transregio workshop once per year, called annual retreat, in order to strengthen the collaboration among all research groups. As a member of the Transregio, you are encouraged to present your recent research results there either as an oral presentation or as a poster contribution and a “poster flash” presentation. In contrast to the student workshop, this is a conference where you have the opportunity to present your work to a broader audience of senior researchers and discuss the results more critically.

## Regular seminars and lectures

Educational activities at three sites mean extra opportunities for you if interested. Specialized lectures covering techniques and theory of the relevant research areas will therefore be given at each member site on a frequent basis by Transregio researchers. The College will announce (on the College website and/or via newsletters) relevant



courses to all members, who are free to attend any of them at any site. Participation is not mandatory, but some courses may be specifically recommended by your mentoring team.

Travel expenses can be covered upon request to attend a lecture at a different site than your own. Popular courses at a given location can be duplicated in the following semesters at the other locations if desired.

In addition, general survey lectures will be offered, which cover the research of the Transregio. Every principal researcher will have the opportunity to present his/her research field in a lecture at each of the three research locations. First year PhD students and researchers having recently joined the Transregio are particularly encouraged to attend these lectures, in order to obtain an overview of the research activities.

Frequent seminars and colloquia from invited guest researchers of Transregio groups will keep you informed about the latest developments in the research community. Please check the College website and newsletter regularly about upcoming events.

## Conferences

Conference travel is an exciting and crucial experience for any scientist. You will decide together with your supervisor at which conferences you will present your results.

In addition, the College supports *coordinated* conference travel. If you plan to attend a major conference together with other College members, it can be useful to coordinate this by preparing for the event together, assisted by an experienced researcher, who can also



support you during the conference and schedule a meeting after the conference in order to reflect on the experience and report to others.

Please inform the Executive Manager about relevant upcoming workshops and conferences in your field, so they can be advertised on the College web-site for everyone else and coordinated conference travel might be organized.

## Excursions

The tasks of scientists in companies and other institutes are versatile and their daily routines may be quite different to what you are used to. It may therefore be useful for you to visit relevant and interesting institutions in science and industry.

Such excursions are supported by the College. However, they will only take place if you initiate them. The College can provide resources and help in arranging and advertising the event. If you plan to suggest or organize an excursion, contact your supervisor or the Executive Manager.

## Exchanges

In accordance with your supervisor, you have the possibility to spend some time away from your own lab in a different group within the SFB/Transregio 49 and, if appropriate, also outside. This is important for the collaborative research progress and offers you a wider educational experience.

The College can provide additional resources for stays of two weeks or longer at other research groups within and outside the Transregio. If you are interested in this exchange program, please do not hesitate to contact the Executive Manager.



## Exchange stipend

Conversely, the College also provides scholarships to finance qualified visiting graduate students, e.g. from collaborating groups. A scholarship consists of 3 to 6 months' stay for international students at one of the participating groups in the SFB, which is financed at the scholarship rates of the German Research Foundation (DFG). Please contact the Executive Manager if you want to suggest somebody for an exchange stipend.

## Soft skills

Research training is the central objective of your PhD curriculum. However, besides producing scientific results, these must be published and communicated. Good knowledge of efficient communication skills is a key ingredient for becoming a successful independent research scientist. Soft skills like languages, “intellectual property rights” management, presentation and publication techniques, marketing and start-up training etc. must thus be an important part of today's doctoral training.

Accordingly, all Transregio sites have already established centralized programs in order to support PhD students in acquiring soft skills. You are encouraged to use the existing infrastructure at the three sites. Course fees can be covered by the College. Please visit the following web sites for further information:

1. Otto Stern School of Integrated Doctoral Education in Natural Sciences (Frankfurt),  
<http://www.oss.uni-frankfurt.de/index.html>
2. International School of Graduate Studies (Kaiserslautern),  
<http://www.uni-kl.de/wcms/isgs.html>



3. Pilotzentrum Internationales Doktorandenforum  
(Kaiserslautern),  
<https://www.docfor.uni-kl.de/docfor.php>
4. General Post-Graduate Programme and Gutenberg Academy  
(Mainz),  
<http://zope.verwaltung.uni-mainz.de/eng/promo/allgemeines>

In addition, the College has a limited budget for individual courses. If you would like to take external individual training, contact your supervisor or the Executive Manager. Suggestions for specially arranged soft skill courses for Transregio members are also welcome and might be included in the student workshops as well.

## Books

Books remain one of the most beautiful and irreplaceable tools for the advancement of science. All books purchased by the Transregio will become part of the College library, so that an efficient exchange and use is also possible. Of course, you are encouraged to suggest books to purchase! Please inform the Executive Manager about your needs.

## Information services

One primary source of information is this manual. Moreover, you can consult the student coordinators, your supervisor, your mentoring team and the Executive Manager.

The College has its own project website accessible from the Transregio web address <http://www.tr49.de>. Important dates, events, member lists, and other up-to-date information will be presented on the College website at <http://lucky.physik.uni-kl.de/~tr49/mgk> Using an email list that is free to sign up newsletters



will be sent by email concerning very important issues. In times of ever-present email spam, these letters will be sent as rarely as possible, but as often as necessary.

If you cannot get the very information you need, contact the Executive Manager (Axel Pelster, [axel.pelster@physik.uni-kl.de](mailto:axel.pelster@physik.uni-kl.de)).



**SFB/TRANSREGIO 49**

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**APPENDIX:**

**CAREER DEVELOPMENT  
PLAN**

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SFB/Transregio 49  
Frankfurt-Kaiserslautern-Mainz

## Introduction

The career development plan is an efficient instrument for optimizing the individual training and research progress. The mentoring team will help the doctoral student update the career development plan in regular meetings. It is an internal document to be mostly used by the student for additional guidance. The supervisor will keep one copy confidentially on file.

This document gives suggestions on how to set up the career development plan by establishing a time plan, identifying strengths and talents, suggesting specific training possibilities, and pointing out opportunities. Accordingly, some topics are proposed that should be discussed in the mentoring team meetings. However, the plan is an individual document for every student and should be adjusted to specific needs.

## Structure

There are two important documents that will be prepared in connection with the mentoring team meeting: The student report and the career development plan itself.

## Student report

Any adjustments and discussions in the mentoring team meetings should also be based on a written report by the student, which has to be prepared and passed to all members of the mentoring team in proper time before each meeting (including the first). All members of the mentoring team will read the report carefully in advance in order to be prepared for the discussion.

On typically one page or less, the student report should contain a brief summary of the current research and training status. In particular, it should summarize the status of project(s) and previous



research activities. A list of talks, written papers, attended conferences, training events (e.g. courses), etc. should be included. If possible, the report should also identify possible opportunities, obstacles, or causes for delay. Specific wishes and suggestions should also be mentioned as needed, as well as ideas for the future. The report should not be used to present research results.

## Career development plan

The career development plan is updated in the mentoring team meeting by documenting the discussion point by point. This can simply be done by selecting one member of the mentoring team to take handwritten minutes. The plan is recommended to be organized in the following way.

### **1. Reflection**

- discussion of the student report
- identify what progress has been made, which goals have been achieved, which training has been taken, which problems/delays may have occurred, etc.

In this way the current status of the project(s) and the career training should be clear to all mentoring team members.

### **2. Research**

- update project description(s) and research goal(s)
- add/update detailed research steps for the next period, including time-frame
- identify needs for skill development, equipment acquisition, research training, exchanges, etc.

### **3. Personal career training**

- update personal career goals



- identify skills to be developed or improved (see list below).
- specify training goals for the next period, including possible suggestions for specific seminars, lectures, workshops, soft skill courses, etc.
- request additional training opportunities if needed (feedback to executive manager).

#### 4. List of planned/desired activities in the next period

- conferences/workshops to attend
- papers to write
- courses/seminars to take (related to research and/or personal training)
- presentations to give
- exchanges/visits to other research groups
- possible leave of absence (e.g. maternity leave)
- identify necessary steps in order to facilitate activities

Please always notify the Executive Manager that a meeting has taken place including time/date, participants, duration, and possible feedback.

#### List of possible skills/talents

The following list might give inspiration about which skills and talents to develop according to the personal career goals and individual strengths and weaknesses

- experimental techniques
- theoretical techniques
- safety management
- languages
- presentation abilities



- writing scientific papers
- writing job applications
- writing proposals
- intellectual property rights management
- marketing
- project management
- computer skills
- company start-up training
- medical/financial/leadership/accounting/... skills
- gaining access to European/national research or computing facilities



NOTES



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