FUNK GROUP HANDBOOK

Welcome

You recently joined the Funk group in the Department of Physics at FAU Erlangen-Nürnberg in the Erlangen Centre for Astroparticle physics (ECAP). That's great! We're really glad to have you here and will do what we can to make your time in the group amazing. We hope you'll learn a lot about physics and astroparticle physics, develop new skills (coding, data analysis, writing, giving talks), make new friends, and have a substantial amount of fun throughout the whole process.

This group manual was motivated by this article. Its content was inspired by several others, and borrows heavily from them (e.g., this one and this one). It's also a work in progress. If you have ideas about things to add, or what to clarify, talk to me (Stefan, the PI) or one of my colleagues at ECAP.

When you join the group, you're expected to read this manual. You're also highly encouraged to read it while deciding if you want to join the group in the first place. You should always feel free to

talk to me to clarify anything in the group manual and let me know if I am not following through on some of the promises in the manual! This manual is intended to be a starting point for a positive mentor-mentee and group experience — but, ultimately, positive experiences will also require active investment in, and refinement of, our one-on-one interactions over time.

Three things are important when I think about my philosophy for mentoring you as a junior researcher in my group. First, I would like to help you become an independent researcher. Therefore, I grant you a substantial amount of freedom especially as you grow more experienced. At the same time I guide you and give you feedback. Secondly, I always aim to surround you with a group of people who you should interact with. Use this network - it is your help desk, your safety net, your place for advise, feedback, for learning and growing. It is essential in almost any profession you chose that you learn to collaborate with other people - you are not alone. Third, your personal and mental health is important to me - balancing work and life can be challenging, in particular when there is pressure from yourself, or from me, or from outside.

Expectations and Responsibilities

1) Everyone

Big Picture

Science is hard. But it's also fun. In the Funk group, we want to make sure that everyone experiences a positive, engaging, hostility-free, challenging, and rewarding environment. To maintain that environment, we all have to do a few things.

- Work on what you're passionate about, work hard at it, and be proud of it.
- Our goal is to do science and to publish our work. This is how we give back to society.
- It takes work to carefully design and analyse data or design a measurement, experiment or instrument in the laboratory. Before diving in, have a chat with me or your direct supervisor about other considerations that may be specific to your study, such as trials or systematic errors. Careful study design is key, and I am always happy to look over your plans with you.
- Scientists have to be careful and precise. Don't rush your work. Think about it. Implement it. Double and triple check it. Incorporate sanity checks. Ask others to look at your code or data if you need help or something looks off. Be pro-active about delays and talk to me or your direct supervisor about it. It is better to communicate it openly.
- It's ok to makes mistakes, but mistakes shouldn't be because of carelessness or rushed work. people should be pro-active about delays, and that it is better to communicate it openly instead of letting it fester until the last minute.
- If you do make a mistake, you should definitely tell your collaborators (if they have already seen the results, and especially if the paper is being written up, is already submitted, or already

accepted). We admit our mistakes, and then we correct them and move on. We should avoid them but if they happen we deal with it together.

- We all want to get papers published. But we do this honestly. It is never ok to plagiarise, or tamper with data, make up data, omit data, or fudge results in any way and can have consequences. Science is about finding out the truth, and null results are still important. Unexpected results can be the seed of something really interesting. Therefore, this can't be emphasised enough: no research misconduct!
- Familiarise yourself with the *Guidelines for good research practice*, e.g. by DFG and by FAU.
- Stay up to date on the latest research, by getting journal table of contents and by reading publications. Attend the department colloquium and the ECAP seminars, even for topic which seem far away from what you are working on.
- Support your fellow group members. Help them out if they need help (even if you aren't on the project), and let them vent when they need to. Science is collaborative, not competitive. Help others, and you can expect others to help you when you need it.
- If you're struggling, tell someone! Feel free to tell me! Your health and happiness come first. The group looks out for the well-being of all its members. We are here to help. It's ok to go through hard patches (we all do), but you shouldn't feel shy about asking for help or just venting.
- Respect your fellow group members. Respect their strengths and weaknesses, respect their desire for quiet if they need it, and for support and a kind ear when they need that. Respect their differences, respect their culture, their religion, their beliefs, their sexual orientation.
- If there is any tension or hostility in the group, something has to be done about it immediately. We can't thrive in an environment we aren't comfortable in, and disrespect or rudeness is not tolerated in my group. If you don't feel comfortable confronting the person in question, tell me.
- If you have a problem with me and are comfortable telling me about it, do! If you aren't comfortable, then tell a colleague in ECAP (for smaller issues) or a member of the FAU conflict resolution team (for more serious issues). For PhD students, also have a look at the site of the Promovierendenkonvent (https://blogs.fau.de/proko/help/) or of the graduate centre (https://www.fau.eu/research/research-careers/completing-a-doctoral-degree-at-fau/conflict-resolution-and-important-points-of-contact/)
- Have a life outside of the lab, take care of your mental and physical health, and don't ever feel bad for taking time off work. Talk to me if you are struggling to balance work and life.

Small Picture

There are a few day-to-day things to keep in mind to keep the group running smoothly.

- If you're sick, stay home and take care of yourself. Because you need it, and also because others don't need to get sick. If you're sick, reschedule your meetings and participants for the day (or the next couple of days) as soon as you can.
- You aren't expected to come into lab on weekends and holidays, and you aren't expected to stay late at night. You are expected to get your work done (whatever time of day you like to do it). It is helpful to obey core hours (9-17), so interaction can take place.

- Use your lawfully established right to take vacations to get your head clear. If you do, let me and Gabi know, so we are aware and have an overview of who is where.
- Show up to your meetings, You do not have to be in at 9am every day – just show up for your commitments, and work the hours you need to work to get stuff done.
- Keep the lab and your office tidy. No eating in the lab. Put lab equipment back where you found it. Keep common areas uncluttered.
- If you really have to do pressing work don't do it during group meetings. Don't bring your laptop to group meetings if it can be avoided (and if you do, please use it only in the context of the talk). Keep your mobile phone in your pocket during meetings.

2) Principle Investigator (Stefan)

I love doing science - this is why I became a scientist. However, there are lots of task I do in a day that are not directly related to science. The highlights of my day are when I can talk about science - therefore, by all means, come and talk to me about science if my door is open. Beyond that, I commit to all of the points above, and in addition I will support you by:

- giving you feedback on a timely basis, including feedback on project ideas, conference talks, and posters, manuscripts, figures, and grants etc.
- responding well and quickly to emails or chat on rocket chat or on slack.
- being available in person and via email on a regular basis, including regular meetings to discuss your research (and anything else you'd like to discuss). The responsibility for organising these meetings is shared, but you should be proactive in getting feedback from me.
- giving you my perspective on where the group is heading, where the field is going, and tips about surviving and thriving in academia.
- supporting your career development by introducing you to other researchers in the field, promoting your work at talks, writing recommendation letters for you, and letting you attend conferences as finances permit.
- making sure your position is financed by writing grant proposals and acquiring funding.
- helping you prepare for the next step of your career, whether it's a postdoc, a faculty job, or a job outside of academia.
- caring for your emotional and physical well-being, and prioritise that.
- organisationally, meeting with you once per year in a formal annual meeting (Jahresgespräch) to talk about all these things.

3) Postdocs (and full-term staff)

The postdoc stage is marked by a transition to increasing independence.
Postdocs spend the majority of time on their own research, whilst also collaborating on a broader range of projects. Postdocs often have several further responsibilities, including sitting on committees, student supervision, and teaching. Postdocs may also be asked to

stand in for PIs when required, and help with or lead grant applications. All of the points mentioned in 1) apply, and in addition:

- familiarise yourself with the ECAP guidelines for early researchers.
- develop your own independent line of research.
- help train and mentor students in the group (both undergraduate and graduate) when they need it – either because they ask, or because I ask you to.
- present your work at departmental events, in other groups (if invited), and at conferences.
- apply for grants (e.g., DFG Sachbeihilfe, ERC, EU Horizon). Although I will only hire you if I can support you for at least one and a half years. It's in your best interest to get experience writing grants – and if you get them, you'll be helping out the entire group as well as yourself (because you'll free up funds previously allocated to you).
- help with the physics colloquium or the ECAP seminar by suggesting (and inviting) speakers. This allows to build important networks for your career.
- for postdocs: apply for jobs (academic or otherwise) when you're ready, but no later than the beginning of your 4th year of postdoc. If you think you'd like to leave academia, that's completely ok – but you should still treat your postdoc seriously, and talk to me about how to best train for a job outside academia.
- challenge me when I'm wrong or when your opinion is different, and treat the rest of the group to your unique expertise.
- know the literature related to your topic!

4) Graduate students

All of the points mentioned in 1), and in addition:

- familiarise yourself with the ECAP guidelines for early researchers (in particular the PhD committee).
- develop your own independent line of research. Your dissertation should have at least two substantial parts that demonstrate that you did novel, meaningful, independent research. Much of your work has to be done independently, but remember that others in the group and in ECAP are there to help you when you need it.
- with my help establish your PhD committee, consisting of me and two additional faculty (see guidelines mentioned above).
- help mentor undergraduate students in the group or generally at ECAP – either because they ask, or because I ask you to.
- present your work at departmental events, at other groups (if invited), and at conferences
- apply for grants (e.g., Studienstiftung des deutschen Volkes or political foundations). It's a valuable experience, and best to get it early.
- think about what you want for your career (academia – research or teaching, industry, science writing, something else), and talk to me about it to make sure you're getting the training you need for that career.

- prioritise time for research on your project. General service work at ECAP or teaching are important, but ultimately your research gets you your PhD and prepares you for the next stage of your career.
- know the literature connected to your topic!

5) Undergraduate students (Master and Bachelor)

All of the points mentioned in 1), and in addition:

- develop your weekly schedule by discussing it with your graduate student or postdoc mentor. You should be coming in every week, and scheduling enough time to get your work done (in particular during Master and Bachelor theses - these are full-time jobs)
- attend group meetings and regularly present your work.
- know the literature connected to your topic!

Code of Conduct

Essential Policies

The group, ECAP, and the university, is an environment that must be free of harassment and discrimination. All group members are expected to abide by ECAP's code of conduct and by FAU's policies on discrimination and harassment, which you can (and should!) read about.

ECAP is committed to ensuring a safe, friendly, and accepting environment for everybody. We will not tolerate any verbal or physical harassment or discrimination on the basis of gender, gender identity and expression, sexual orientation, disability, physical appearance, body size, race, or religion. We will not tolerate intimidation, stalking, following, unwanted photography or video recording, sustained disruption of talks or other events, inappropriate physical contact, and unwelcome sexual attention. Finally, it should go without saying that lewd language and behaviour have no place in the group, including any group outings.

If you notice someone being harassed, or are harassed yourself, tell me immediately. If I am the cause of your concern, then reach out to other ECAP faculty, to the department chair or another trusted faculty member in the department.

Taking Photos & Videos

We respect the privacy and comfort of group members by only taking photos or video recordings of them with their explicit knowledge and consent. This is especially important in situations where a group member would otherwise not be aware of you taking a photo and therefore cannot object if they do not want you to – e.g., if they are wearing one of our VR headsets or are being scanned. To

avoid ambiguity about when a group member is vs is not aware of photos being taken, we ask that everyone obtain consent from group members before taking photos or videos, and obtain consent again before posting any images on social media. This is done to respect others' privacy and acknowledge that people have varying degrees of comfort related to being photographed and especially with having those photographs shared on social media.

The goal of this is to foster an environment where everyone feels safe to be who they are, take risks, and have fun, without worry or self-consciousness. If someone wants to be photographed doing something fun or silly in group events, and consents to be photographed, it is fine of course. Just please respect the privacy of those who do not want that.

Scientific Integrity

Research (Mis)conduct

The group, ECAP and FAU, are committed to ensuring research integrity, and we take a hard line on research misconduct. We will not tolerate fabrication, falsification, or plagiarism. Read DFG's and FAU's policies on the conduct of research carefully.

A big problem is why people feel the need to engage in misconduct in the first place, and that's a discussion that we can have. If you are feeling pressured to succeed (publish a lot, publish in high impact journals), you should reach out to me and we can talk about it – this pressure is something we all face and is never an excuse to fabricate, falsify, or plagiarise. Also, think about the goal of science and why you are here: you're here to arrive at the truth, to get as close as we can to facts about the universe Not only is research misconduct doing you a disservice, it's also a disservice to the field. And it risks your entire career. It is never right and never worth it. Don't do it.

Reproducible Research

If you gave someone else your raw data, they should be able to reproduce your results exactly. This is critical, because if they can't reproduce your results, it suggests that one (or both) of you has made errors in the analysis, and the results can't be trusted. Reproducible research is an essential part of science, and an expectation for all projects in the lab.

For results to be reproducible, the analysis pipeline must be organised and well documented. To meet these goals, you should take extensive notes on each step of your analysis pipeline. This means writing down how you did things every step of the way (and the order that you did things), from any pre-processing of the data, to running models, to statistical tests. It's also worth mentioning that you should take detailed notes on your experimental design as well. Additionally, your code should also be commented, and commented clearly. We all know what it's like to sit down, quickly write a bunch of code to run an analysis without taking time to comment it, and then having no idea what we did a few months down the road. Comment your code so that every step is

understandable by an outsider and write code adhering to good programming praxis. Finally, it is highly encouraged that you use some form of version control (e.g., Git in combination with GitHub) to keep track of what code changes you made and when you made them, as well as sharing code with others.

Authorship

Like many other labs, we will follow the APA guidelines with respect to authorship:

> "Authorship credit should reflect the individual's contribution to the study. An author is considered anyone involved with initial research design, data collection and analysis, manuscript drafting, and final approval. However, the following do not necessarily qualify for authorship: providing funding or resources, mentorship, or contributing research but not helping with the publication itself. The primary author assumes responsibility for the publication, making sure that the data are accurate, that all deserving authors have been credited, that all authors have given their approval to the final draft; and handles responses to inquiries after the manuscript is published."

For collaborative papers, we usually list authors in alphabetical order. For small-author list papers the following applies: at the start of a new project, the student or postdoc taking on the lead role can expect to be first author (talk to me about it if you aren't sure). I will typically be the last author, unless the project is primarily under the guidance of another PI – then I will be second to last and the main PI will be last. Students and postdocs who help over the course of the project may be added to the author list depending on their contribution, and their placement will be discussed with parties involved in the paper. If a student or postdoc takes on a project but subsequently hands it off to another student or postdoc, they will most likely lose first-authorship to that student or postdoc, unless co-first-authorship is appropriate. All of these issues will be discussed openly, and you should feel free to bring them up if you are not sure of your authorship status or want to challenge it.