

Information Sheet for PhD students (Working Group Paleoclimate Dynamics)

PhD Thesis – Relevant Formalities and Procedures

- Advisor and PhD student write a short thesis outline including title, aim and work plan. The outline shall contain some major hypothesis, first results etc. It shall be in a similar way as a Master thesis paper: <https://paleodyn.uni-bremen.de/gl/thesiswriting.html>
- To apply as a PhD student at the University of Bremen, see the “Promotionsordnung” of what is necessary. Here for Physics:
www.uni-bremen.de/fileadmin/user_upload/sites/referate/referat06/8.6.6_PromO_Dr_rer_nat_FB_1_09.02.15.pdf
for other faculties, please have a look at
www.uni-bremen.de/byrd/promovierende/promovieren-an-der-universitaet-bremen/promotionsordnungen/
- Each PhD student has a PhD committee with a doctoral father/mother and additional senior scientists. It is necessary to include persons from other departments at the AWI, University of Bremen and beyond. The PhD student should be encouraged to add further persons to the committee if necessary or desirable (e.g., another PhD student). The PhD student meets with the PhD committee at least once half year. A protocol is sent to the committee and POLMAR after the meeting (please not more than a week).
- The default contract period for PhD students at the AWI is 3 years. In case of a working visit at another scientific institute during that the contract period, the time of the AWI contract might be prolonged by that visiting time if the stay has been sponsored by external funding (EU, DAAD etc.). Furthermore, there might be the chance that AWI prolongs the working contract for additional 3 months if the PhD thesis is submitted in time. (*Please always ask about the current contract rules as these might change in time.*)
- The final PhD thesis should consist of the following sections: introduction, methods, results, discussion, and conclusions. The introduction should cover all aspects of the work, including the main hypotheses, and relevant literature for the subject. In the thesis introduction it shall be also declared, which parts of the thesis are part of already existing and/or submitted scientific publications and who have been the collaborators of the work. The results of the PhD work are then presented in the following chapters, which can also contain already achieved publications (similar to a cumulative thesis). Finally, in the discussion and concluding sections the main hypotheses, as stated in the introduction, should be discussed. The thesis should contain one list of literature sorted in an alphabetical order. Technical aspects of the PhD work should be put in an appendix. Please look at
<https://paleodyn.uni-bremen.de/gl/thesiswriting.html>
for some hints
- For the written review of the PhD thesis, 2 written reports by professors from the University of Bremen are required. The review process can take up to 6 weeks plus additional 2 weeks for administrative processes within the faculty. The second reviewer has to be determined by the PhD candidate him/herself. In the physics faculty there are currently Profs. Rhein, Notholt, Burrows, Mihalis Vrekoussis from the Environmental Physics Department at the university, several Profs from AWI (see the web site), and the faculty (<https://www.uni-bremen.de/fb1>). Alternatively, the second (or a potential third) referee can also be a professor from another German or international university, whose expertise is related to the topic of the PhD thesis.

- The oral evaluation of the PhD thesis is typically 2-3 months after the submission of the written thesis. The evaluation committee consists of the above mentioned 2 referees of the thesis, 2 additional Profs or habilitated persons (one of them must come from the University of Bremen, at least one shall be outside the Climate/Environmental Physics), 1 person with doctoral degree, and 1 student. The PhD candidate shall speak with the selected persons in advance, and then find a proper day and reserve an available room for the oral evaluation. This is typically the most difficult part of the PhD.
- The oral evaluation is structured in 30 min talk, 15 min questions and answers to the talk/thesis (everybody in the audience can ask questions); 45 min about the surrounding field of physics and more general questions by the committee. As you can read in the Promotionsordnung, the final grade is based on the 2 written evaluations (with 33.3% each), and the oral evaluation (33.3%).

Publication of Scientific Results

- All PhD students are encouraged to publish their results as scientific papers. During the default PhD contract period of 3 years, the international standard to be met is: 1 published/accepted publication, plus 1 publication accepted (or at least submitted,) plus 1 publication ready for submission. However, quality matters more than quantity!
- After the first working year, the PhD student and PhD committee shall discuss the publication strategy.

Participation at Scientific Conferences and Workshops

- All PhD students should present their results on an international meeting; at least one presentation should be an oral contribution.
- For an application to a conference or workshop, the PhD student should discuss participation in time, prior to the according abstract submission deadline.
- If a PhD student has participated at a conference or workshop, he/she reports on it in the Paleoclimate Dynamics group meeting afterwards.

Presentation of PhD Work at the AWI

- The PhD students present their topics after 6 months at a Seminar at AWI and discuss it with the PhD committee. There will be an open discussion including a mutual evaluation in the committee.
- All PhD students report on their work about once per year in a seminar talk (e.g., Friday Seminar of the AWI Climate Science Division). Working progress and existing problems shall be discussed in smaller meetings.

Working Visits at Other Scientific Institutes

- All PhD students are encouraged to spend some time (2-6 months) in another scientific institution related to the work.
- In the ideal case, this stay is sponsored by EU, DAAD, or another funding agency. The

PhD student should write the related travel funding proposal him/herself, as this is a good training for writing a full research proposal for later stages of the scientific career.

Further Scientific Training

- Teaching networks and research schools provide a forum to allow interaction with internationally leading researchers and other students. Thus, all PhD students are encouraged to take courses at Helmholtz Research Schools and/or similar PhD programs offered at the Bremen universities.
- Most of the international courses offer grants, which should be applied for by the PhD student.
- There exists also the possibility to participate at normal lectures at the University of Bremen (Dynamics I, II, Climate, Carbon cycle etc.). Once the time during the 3 years, PhD students will be a tutor for Dynamics II at the university. This has the advantage that persons are familiar with the themes, and get also some teaching experiences.
- Self-organised reading clubs are highly recommended. The club may deal with some basic knowledge in dynamics (e.g. books of Holton, Gill), data analysis and modelling, theoretical knowledge in paleoclimate dynamics (e.g. Saltzman), as well as fundamental papers (like that of Hasselmann about the stochastic climate model, Imbrie et al. about Milankovitch cycles, North et al. about energy balance models, and others). The required books are in the library. If important books for the reading club are not available in the library, give a sign.
- Taking a course in scientific writing is highly recommended to every PhD student.

Absence from Office

- If a PhD student stays in Bremen to participate in some university activities or work at home for reading/writing, follow the group's rule. (e.g., in case of illness, give a sign.)
- When a PhD student is taking holidays or going on a conference/workshop, provide the related information.
- Those persons who are directly involved in the PhD project should also be informed about any longer absence from office.

Final Remarks

- There is an AWI PhD student assembly, and the expertise of the more experienced PhD students are a very good source of help for various problems and open questions!