

Evaluation of Third Cycle Education at Department of Physics

Panel:

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On 28 October 2019 the panel met with members of the Department of Physics in a series of
scheduled meetings between 9:00 and 15:00. These meetings were followed by a brief feedback
session.

9:00-10:00 Interview with Department leadership

10:30-11:30 Interview with Doctoral students

11:30-12:30 Interview with Supervisors and Examiners

13:30-14:30 Interview with Administrative Staff

14:30-15:00 Interview with Alumni

15:30-16:30 Feedback session with Department leadership

In the following, the panel summarizes the results of these interviews with a total of about 20
people, as well as from the documents we were supplied with. We give a general impression of
the quality of the PhD education and conclude with a set of recommendations. In the Appendix
there is a summary of the documents provided in preparation for this review as well as the review
criteria.

The department is a relatively small physics department when compared with other physics
departments at the main Swedish universities. It has about 80 employees, including all staff, and
17 research groups. The research groups are essentially the principal investigators with postdocs
and PhD students. There is no additional layer like research divisions between these and the
department's leadership. There are at present 21 PhD students and 17 have finished their PhD
in the period 2015-2019. There are 24 teachers, 12 professors, 8 senior lecturers, 3 assistant
professor level and one researcher, employed. The department together with the physics related
groups at Chalmers University of Technology based in the same set of buildings forms the
Gothenburg Physics Center. This consists of about 540 researchers, including PhD students, in
physics. The department's research groups are encouraged to interact with each other and with
the groups at Chalmers.

The PhD students have one main supervisor, one or more deputy supervisors and an examiner
who has the responsibility for deciding on courses. The examiners are all professors. The students
are normally financed 75% (corresponding to about three years) from external grants and 25%
(corresponding to about one year) from the department (faculty funding). The exception is that

new young staff, assistant professors, obtain one PhD student fully financed by the department. The assignment of main supervisors of PhD students follows the external grants. This leads to an uneven distribution among the teachers as PhD supervisors, of the 24 teachers listed at present 15 have no active PhD student while 3 teachers have three or four.

We did not in detail check how the general goals of the PhD education in the Higher Education Ordinance (högskoleförordningen) were reached but included how they were lived up to in the discussions with the administration, teachers and PhD students. Our general impression is that the scientific quality of the environment is good and the department has a good scientific reputation and research quality. The same was true for the competence and higher education pedagogical knowledge of the teachers and supervisors. The learning environment is somewhat dependent on the group the students are in, better for the well-funded groups with more students and postdocs but adequate in the others. The research environment, especially when the whole Gothenburg Physics Center is taken into account is excellent. The follow-up of the students, also via the individual curriculum (ISP, individuell studieplan) is adequate. There are a number of courses available both specialized and more general, including those for soft skills, but the total opportunity for taking courses that would prepare the students for life outside of the academia was felt by the students to be a bit low.

The satisfaction of the students was dependent on which group they belonged to -- it was good for those belonging to larger groups and adequate for the smaller groups. In conclusion the PhD education in physics at Gothenburg university is good, but there are some areas where improvements are desirable. Implementing the comments below should concentrate on keeping the good aspects while improving the others.

Over the course of the meetings some issues were raised that should be addressed. These include the following:

Examiner role

The individual study plan, the ISP, was not used in a consistent way within the department. This was acknowledged by students and teachers alike.

In order to decide on how to work with the ISP, a meeting with all involved parties should be held. When forms are decided on, the examiner-supervisor-student team can actually use it as a reporting system, and also as a contract between supervisor and student. We recommend that the process of updating the ISP should be initiated by the director of PhD studies. Improving the system such that a more continuous drafting of the document is possible before the meeting of the examiner-supervisor-student team is desirable.

It is an important principle to treat all the students formally and practically alike, regarding decisions on which courses to take during their doctoral education, and how to grant study points for activities such as reading courses and conferences, etc. The new guidelines under development should have clear criteria on how to evaluate study points for each activity.

There are several professors in the department that supervise very few if any doctoral students, which is why the output of PhD degrees is relatively low. The department should think of ways to involve all active researchers in student supervision.

Supervision

The introduction days/course are functioning well, and the interview with supervisors adds to this. A good idea would be to follow-up the interview after a certain number of months, in order to reevaluate the communication and working methods of the student and supervisor team.

Human Resources (HR)

As half of the current PhD students are international, there is a great need for an identified contact person for international students. Currently, practical problems arising during the early months have been handled by the administrative staff of the department, who seldom perform these types of support activities. A centrally placed HR person at the university or faculty level should be available for this support.

Administration/Communication/Information

It would help students and supervisors if the guidelines for thesis exam protocol and actions were updated every year, both in English and Swedish, and the students made aware of which is the version of the information that is up-to-date.

Many students did not know whom to contact, if a problem arises that cannot not be handled by their supervisor or examiner. The department should create a document clearly outlining the path and actions that the student can take and whom they can contact in various problem scenarios.

Some PhD students also had no clear view of what to do when ordering materials and generic equipment needed for their research

Department togetherness

There is a Department newsletter, which could include more student information, for example on possible summer schools, MOOCS and general courses.

The Monday meetings could be further developed as a means to obtain more of a department and a Gothenburg University PhD student body feeling.

We recommend the PhD students to have a GU group, not just as a part of the combined Chalmers/GU student organization. The teaching distribution could be done then in consultation with this group.

IP resources and library

The inclusion of the department within the Chalmers environment is generally of benefit to the students, but it causes IP address problems when reaching the Library Databases and GU software licenses.

Courses

The students interviewed showed a very different knowledge on possible courses to take during their PhD education. There are rather few physics courses offered at the PhD level, one per year. Increasing this would be an improvement but including summer schools, MOOCS and presentations at conferences as part of course work would improve the course situation. The Department should find a way to inform all students about possibilities such as summer schools, MOOCS, reading courses, etc.

The possibilities for obtaining generic or soft skills can be improved. The waiting list for these courses is rather long at present. Useful skills to obtain are:

- Pedagogics
- Academic writing
- Ethics and research methods,
- Collaborate with other universities,
- Entrepreneurial skills
- Grant writing and application

We recommend that in case such courses cannot be organized by the Department or by the University they should be outsourced to well-reputed external parties.

Teaching

The teaching falls mainly on the Swedish speaking students. Ways to have the foreign students contribute to the teaching should be investigated, both to distribute the teaching more evenly and for the extra experience/skills teaching brings.

Halftime check

A good option would be to have a more standardized halftime checkpoint. This could be in the form of a short document and presentation, which can be seen as a precursor to the actual dissertation and defense preparation or, optionally if the student wants it, a licentiate examination and thesis.

Summary

The panel's assessment of the department's PhD education is that it is a good PhD education within the Swedish system. The basic goals of PhD education are obtained. Improvement is possible in a number of areas and discussed above.

Recommendations	Priority
Improve the course environment and make sure that all PhD students are treated equally in this respect, create clear guidelines for the coursework and what can be counted towards the course requirements.	Must
Formalize the ISP updating in a way that the start of each updating is initialized by the department.	High
Strongly encourage the PhD students to form a GU physics PhD student official group which can then be used to consult with teaching and other department matters.	Medium

Improve the number of courses for soft skills and their accessibility to the physics PhD students.	High
Find new and/or improve existing ways to get more of a department feeling	Medium
Provide clear guidelines who can be contacted in case of problems and/or administrative difficulties.	High

Appendix

In preparation for the day, the panel received extensive documentation from the department that included:

0. Description of the Department of Physics and Its PhD Education
 1. The general syllabus for PhD studies
 2. Course syllabuses for compulsory courses
 3. Course syllabuses for some other relevant courses
 4. Rules and regulations for PhD studies at the University of Gothenburg and at the Faculty of Sciences
 5. Steering documents, procedures and memos for the Department of Physics
 6. Documents describing continuous monitoring and development activities
 7. Action and operational plans, and monitoring documents
 8. Guides for the PhD courses given at the Department of Physics
 9. Random selection of examination papers and doctoral student accomplishments with assessments
 10. Compilations of course evaluations
 12. List with active doctoral students and the focus of their thesis
 13. A set of individual study plans (ISPs)
 14. List of teachers with form of employment, academic qualifications, pedagogical training, scope of teaching and research activity
 15. Doctoral students' comments on the input documents and the programme

The role of the panel was to review whether the provided education meets the following criteria: (From V 2017/634 Guidance for external review of third-cycle studies)

- Achieved study results match intended learning outcomes and the qualitative targets of the Higher Education Ordinance.
- Teaching is focused on student/doctoral-centered learning.
- The content and form of teaching rests on scientific and/or artistic bases and proven experience.
- Teachers have up-to-date and adequate competence as regards their subjects and teaching and learning in higher education, and the numbers of teachers are in proportion to the scope and content of study courses and programmes.
- Study courses and programmes are relevant to the needs of the students/doctoral students and society.
- Students/doctoral students have influence in planning, implementing and monitoring study courses and programmes.
- The study and learning environment is accessible and purpose-oriented for all students/doctoral students.

- The study courses and programmes are continuously monitored and developed.
- That the doctoral students have access to an active research environment with sufficient subject depth, subject width and scope.
- The possibility for doctoral students to collaborate with researchers both nationally and internationally and with the surrounding community.

The panel should also report any perceived weaknesses that cannot be clearly referred to any of the criteria. The faculty/department may also communicate with the panel if any of the criteria, parts of them or other areas are of particular interest.