Physics
Graduate Student
Handbook

Entering Class of 2020

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Yale University, Department of Physics, 35 Sloane Physics Laboratory, 217 Prospect St. New Haven, CT 06511

Physics Graduate Student Handbook

Introduction

Welcome to the Yale University Department of Physics Graduate Program. The purpose of this handbook is to provide you with a summary of the important information you will need as you make your way through the graduate curriculum, carry out your research, and complete your thesis. In the initial years when you are learning to teach and carrying a heavy load of classes, Graduate school can feel overwhelming. The faculty and the Director of Graduate Studies (DGS) encourage you to communicate frequently and freely with them and to collaborate with your fellow students in learning the vast amount of material that you need to acquire in reaching the forefront of research. You will do much of your learning outside of the classroom in conversations and problem solving sessions with your colleagues. Physics study and research is a collaborative experience that should be both fun and exciting.

This handbook provides an unofficial summary of some of the administrative requirements you will have to fulfill. If you encounter any errors or have any questions, please do not hesitate to contact the Physics Registrar and/or the DGS. For more detailed official information please refer to the Graduate School of Arts and Sciences Annual Programs and Policies Bulletin.

Students are reminded that the policies of the Graduate School must be followed and supersede those of the department.

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Academic Requirements

Course Requirements

Over the course of the first and second years, students are required to complete:

- Five foundational courses +
- One advanced elective +
- Two research seminars +
- One PHYS 990: Special Investigations (SI)

The purpose of the foundational courses is to complete the student's undergraduate training in classical and quantum physics. Students who have already taken comparable core courses should take the Pass-Out exam to be excused from taking a foundation course. Any required courses that are passed out require the student to take an additional advanced elective. Course information can be found on the Yale Online Course Search page.

Advanced electives should be selected from the list of graduate elective courses offered by the Physics or Applied Physics departments, or courses offered by other departments with the approval of the DGS. Several department offered electives are listed below.

In addition, all students are required to engage in a research project by taking PHYS 990, Special Investigations.

In their first year of study, students should take, at a minimum:

- Foundational courses: PHYS 500, 502, 508, 512
- Research seminar courses: PHYS 515, Topics in Modern Physics Research, and
- PHYS 590, Responsible Conduct in Research for Physical Scientists

The course requirements are intended to offer increased flexibility to customize a student's path through the courses, and to jumpstart a student's pursuit of research opportunities. Four different examples of first year course selections can be found **here.**

5 Foundational Courses:

- Phys 500 Advanced Classical Mechanics
- Phys 502 Electromagnetic Theory
- Phys 508 Quantum Mechanics I
- Phys 512 Statistical Physics I
- Phys 608 Quantum Mechanics II

One or more Advanced Courses:

- Phys 538 Intro to Relativistic Astrophysics & General Relativity
- Phys 609 Relativistic Field Theory I
- Phys 610 Quantum Many Body Theory
- Phys 628 Statistical Physics II
- Phys 630 Relativistic Field Theory II

Two Research Seminars:

- Phys 515 Physics Research Options
- Phys 590 Responsible Conduct of Research

One Special Investigation: Phys 990

Special Investigations - PHYS 990

The PHYS 990, Special Investigations (SI) course is a course-based research experience, intended to help students to identify promising areas of thesis research. To pursue an SI, a student first identifies a faculty advisor for the project, who must have a primary or secondary appointment in the Physics Department. After registering for Phys 990, your SI advisor must be added as an instructor using the Individual Study Course Information form.

Within the first two weeks of class, in consultation with the advisor, students are required to submit an approved cover page and brief ½ to 1-page long written proposal specifying the plan of action for the SI project. The proposal should include short motivation for and description of the proposed research and the outcome of the work. The proposed research description can be as short as “addressing this theoretical problem” or for experimentalist, description of setup, measurement, and analyses of a problem. Outcomes of work include a presentation, or a writeup as technical note or potential paper.

The cover page must include your instructor’s approval, attached to your written report and send to the Registrar/DGS for further approval. The SI grade is assigned by the SI advisor and written feedback to the student should be given on this form. Students may want to pursue SIs in different subfields to explore their research options before committing to a PhD thesis topic. The DGS will not approve an SI for audit.

Pass-Out Exams

The Physics Department offers “pass-out” examinations for the five core courses, to be given at the start of each course, to determine whether a student has sufficient mastery of basic material to be excused from that particular core course. To be eligible to take this exam a student must have had a more-or-less equivalent-level course elsewhere. The exam will be administered by the DGS and a previous year’s

lecturer of the course. A student who is excused from a core course must replace it with an advanced elective in order to reach the same total number of required courses.

Starting fall 2020, pass-out exams must be taken during the first year of graduate school.

Course Waivers

Equivalent course work completed elsewhere and taken while registered as a graduate student, may enable a student to be excused from one of the required courses. For students to pass out of a core course requirement, whether or not they have taken an equivalent graduate course elsewhere, they must pass the “Pass-out” exams administered at the beginning of the semester in which the course is taught. That core course requirement is then replaced with an advanced elective.

These waivers are done at the discretion of the DGS and with the approval of the Graduate School Associate Dean. No more than three courses can be waived, and any core courses excused must be replaced with an advanced elective in order to reach the same total number of required courses.

Course waiver petition forms can be found here.

Taking Courses Outside the Department

If you desire to take a course outside of Physics or Applied Physics, this should be brought to the attention of the DGS and to your research adviser for their review.

Registration Information

All students must register for their courses on-line. If a student does not need to take other courses in a particular semester, then the student must enroll in either Admission to Candidacy (CAND 999) (for students in yrs. 2-3), or Dissertation Research (DISR 999) (for students in yrs. 4+).

Students should go to the Yale University Student Information Systems and log in with their netID and password. Then choose On Line Course Selection to choose courses. The DGS will then approve your course selections or notify you if there are any questions. Registration normally ends two weeks after the first day of classes for that term.

Grade Requirements

The grades assigned in the Graduate School are:

H = Honors
HP = High Pass
P = Pass
F = Fail

The Physics Department requires a grade point average of HP for a student to remain in good standing. In addition, the Graduate School requires that a student must attain at least two grades of Honors within the first two years of study. A grade of P is generally considered an unsatisfactory grade, its name notwithstanding.

Incomplete Grades

In occasional circumstances, a student may need additional time to complete coursework. An arrangement for a completion date must be worked out with the instructor. Together, the student and instructor will submit a Request for Temporary Incomplete form to the DGS for approval. Students requesting more than one Temporary Incomplete (TI) must also receive the Dean's approval. Incomplete grades must be converted to a final grade no later than October 1 of the following academic year. Otherwise, the TI will be converted to a permanent Incomplete (I) . Faculty should email registrar.gsas@yale.edu directly to request an update to a student's grade. See Graduate School Program & Policies Bulletin for more details.

Qualifying Exam

Please note there will be no Qualifying Exams for Fall 2020

The Qualifying Examination must be taken for the first time no later than the beginning of a student's third semester. Any entering students may take the qualifying examination at the start of their first year. If a first-year student passes the exam, it satisfies the requirement. If the student does not pass, it does not count against the student in any way. In particular, it does not count as one of the two permitted opportunities to pass.

The exam will consist of four (independent) parts, with two questions in each part. A typical exam might be as follows -

Part 1: Classical Mechanics

Part 2: Electricity & Magnetism

Part 3: Quantum Mechanics

Part 4: Statistical Mechanics

The Parts are graded and passed (or failed) separately. The content of the exam will draw from this list of topics. Please see the "Qualifying Exam - Past exams" to view exams for the past 10 years.

To create, administer, and grade the Qualifying Examination, a committee will be established by the Chair of the Physics Department. Both the Exam Committee and the students will be given the list of exam topics. Students taking the examination will remain anonymous to the committee and to the faculty (except the DGS) until the results of the examination are accepted by a vote of the faculty.

Students will be given associated letter grades, one for each part – A through F – based on their performance. A, B, and C are passing grades. D and F are failing grades. The letter grades will indicate performance in the top third of passing grades (A), performance in the second third of passing grades (B), performance in the bottom third of passing grades (C), inadequate performance (D), and very poor performance (F). The line between C and D, and D and F will be established by the committee for each of the two parts and approved by a vote of the faculty.

Students will have two opportunities to pass each part of the Qualifying exam. If a student fails any part(s), then they only need to retake those part(s) in their next attempt. Students who do not pass all four parts of the Qualifying exam by the beginning of their second year can request to take an Oral exam after 2-3 months, for the part(s) that they failed. Alternatively, students may also opt to retake those part(s) of the written Qualifying exam at the beginning of their third year.

If a student does not pass the exam after two attempts (either written or oral), the faculty can decide to offer the student an oral exam, and if completed successfully, the student can proceed to candidacy.

Students are encouraged to review past exams prior to taking the Qualifying exam. Past Exam question and solution sets are provided here.

Master's Degree Requirements

M.S. Students who complete the four core courses (1. PHYS 500, Advanced Classical Mechanics; 2. PHYS 508, Quantum Mechanics I; 3. PHYS 502, Electromagnetic Theory I; 4. PHYS 512, Statistical Physics I), plus one of the following: PHYS 608, Quantum Mechanics II; PHYS 990, Special Investigations; or an advanced elective (all with a satisfactory record) qualify for the M.S. degree. Certain equivalent course work or successful completion of a pass-out examination may allow individual students to substitute an elective course for a required one. Course information can be found on the Search Yale Courses Page.

M.Phil. Students who have successfully advanced to candidacy qualify for the M.Phil. degree.

Petitioning for Masters' Degree

Students can submit a Degree Petition (En Route and Terminal) form for their degree once they have met the requirements for the degree. Any student who hasn't petitioned for their Master's by the time they advance to candidacy, will automatically be considered for such degrees at the next degree award date. Petitions should be completed by the student and returned to the Physics Registrar at the end of the term in which requirements have been completed.

Students who are departing from the program after satisfying their degree requirements, but prior to advancing to candidacy, must complete the same form seeking a terminal degree.

Teaching

Teaching experience is regarded as an integral part of the graduate training program. Physics students are supported on University Fellowship during the academic year for their first two years and must serve as teaching fellows during this time. Students supported by University Fellowships teach at the TF10 level (10 hrs/week). Training is provided.

Teaching Fellow tasks in this case refers not only to grading, but also teaching in a laboratory, study hall or discussion section in which you can develop classroom presentation skills. These presentation skills are essential to your future success as a teacher and researcher.

Students may choose to teach, after fulfilling their requirements, for additional funds. You should always discuss teaching assignments with your advisor before agreeing to teach.

Training for Teaching

The Poorvu Center for Teaching and Learning is a useful resource for all of your teaching needs. Workshops and courses are held throughout the year and incoming students are required to attend "Teaching at Yale Day" during their orientation period. New graduate students are also required to attend the 4-part seminar series "Fundamentals of Teaching Physics" developed and run by McDougal Teaching Fellows in physics where you will acquire specific training in teaching Physics lab or lecture courses.

Teaching Requirements

Most physics students serve as Teaching Fellows in their first two years, with a teaching commitment of 10 hours per week (TF10 appointment) each semester. As soon as you know the course in which you will be a TF, you should immediately contact the course instructor to let him/her know that you've been assigned to their course, and to find out when any course staff meetings are scheduled. Such meetings are usually held a little before the undergraduate semester begins and mark the start of your semester's teaching responsibilities.

Throughout the semester you must fulfill your teaching obligations conscientiously. If you find that you are routinely required to spend more than 10 hours per week on your teaching duties, you should contact the DGS. Your teaching obligations only end when you are released by the course instructor. In particular, you will likely be asked to help grade the final exam. It is therefore essential that you be at Yale from a few days before the first day of classes until after the final exam is graded.

Language Requirements for Teaching

Students whose native language is not English (and have not taken the Test of Spoken English (TSE) with a score of at least 50 or 27 on the TOEFL) are required to pass the SPEAK assessment

administered at Yale within the first two years of study. Non-native English speakers are strongly encouraged to take advantage of the many course opportunities and English conversation groups available through the Graduate School and the English Language Institute (ELI). If you are not able to speak and write English fluently, you will find it very difficult to carry out your research, write publications, or find employment.

Research and Advising

First and Second Year

Finding a Research Group

Finding the right research group and graduate advisor in graduate school is critical to your success. In a student's first year of graduate school, Phys 515 will offer an overview of the research groups in the department through interactive seminars given by the faculty. Students will also have the opportunity to work on research projects with the potential advisors during the summer between their 1st and 2nd year of study. By the start of your 3rd year, you should be prepared to officially select your advisor/research group.

Important factors to consider in finding an advisor and research group include the following: Are their good projects for graduate students? Do they match your interests? Is the advisor accepting new students? What do the past and current students and postdocs in the group do in later stages of their careers? What is the advisor's philosophy with respect to students and postdocs in the group? For example, do they tend to work more independently or in groups?

Besides communicating with the advisor, it can be very useful to talk to the current students and postdocs in their group. As always, discuss your options with the graduate program team.

Summer Research Between Years 1 and 2

Students are expected to work in a research laboratory during the summer after their first year in order to gain experience in a field of potential interest. Students are supported through the research group in which they work during the summer, and not on University funds. This research experience may turn out to be the beginning of a research collaboration with a future adviser, but there is no obligation to continue working in the same group if you decide it is not suitable. Students who have not passed the qualifying examination are expected to make arrangements with the summer adviser to allow time to study for the exam.

Be sure to notify the Graduate Registrar once your summer research plans have been confirmed with the faculty you will be working with.

Choosing an Adviser

Formal association with a dissertation adviser normally begins in the third or fourth term after the qualifying examination has been passed and after most required course work has been completed. It is critical though to start exploring possible advisors in your first year at Yale. An adviser from a department other than Physics can be chosen in consultation with the DGS, provided the dissertation topic is deemed suitable for a physics PhD.

Be sure to seek out faculty and talk to them no later than your third term, if not earlier, to discuss your interest and possibilities of collaborating. Although the department does everything it can to help students who are having difficulties find a mentor, the Department does not “provide” a mentor for you. There is no guarantee that a particular mentor will have an opening and research funding available when you are ready to commit to a research group, hence it is imperative that you explore different advising opportunities within a subfield and perhaps even more than one subfield of physics.

Third Year and Beyond

Admission to Candidacy

The graduate school requires all students to be admitted to candidacy by the end of the third year. Students who have completed their course requirements with satisfactory grades (a High Pass average and the Graduate School requirement of two Honors (which can include PHYS 990 Special

Investigation)), pass the qualifying examination, and who have submitted an acceptable thesis prospectus to their core thesis committee are recommended for admission to candidacy.

Students must be admitted to candidacy by the end of the third year or they will not be permitted to register for the next term. At the time of advancement to candidacy, students who have not petitioned for or received en route degrees (e.g., M.A., M.S., M.Phil.) will automatically be considered for such degrees. If a student advances to candidacy after the deadline to submit a petition for the degree in that term, the student will be considered for a degree in the following term.

Core Thesis Committee

A core thesis committee, consisting of thesis advisor and 2 additional faculty members must be selected by each student at the earliest opportunity, either in the second semester of the second year or in the first semester of the third year but no later than the end of the third year when the student's thesis prospectus will be evaluated. The committee composition can be changed later.

Students should meet with their thesis committee in their third year and no later than the end of their third year to evaluate their thesis prospectus. Before submitting their prospectus to the DGS, students should present their prospectus to their committee and have the committee complete a "Thesis progress report form". The signed form and a copy of your prospectus should then go to the Graduate Registrar. Once the Registrar has received your approved prospectus you can be advanced to candidacy.

Subsequently, each student must meet periodically with their core thesis committee in closed session to discuss progress. These meetings will occur at least once per year but could be more frequent. It is the student's responsibility to arrange these closed session meetings at least once per year or more frequently if deemed necessary by the student or the committee.

The purpose of these closed-session meetings can be but is not limited to the student providing a formal scientific presentation to the committee. An update on the student's research progress is appropriate and is often done in conjunction with the public presentation requirement mentioned below but should not be the sole focus. Rather, the goal of these meetings is for the committee to assess the student's overall progress as a physicist. For example, one important role of the core thesis committee is to ensure that the student has a sufficiently broad knowledge of their subfield. The committee may choose to do this via a variety of procedures at their discretion. Questions on, and related to, the field and on physics in general will be a typical part of these sessions. In addition, the committee should assess the student's professional progress, i.e. exposure to the literature and the work of other groups e.g. via conferences; opportunities to write and present their work orally; attendance at relevant seminars and/or classes; etc.

The ongoing monitoring of a student's research progress through these meetings should diminish the chances of surprises at the thesis defense. Such monitoring can also provide a protection to both the student and advisor: First, if a student has sufficient material for a PhD, then the committee can push a reluctant advisor to agree to a thesis defense. Alternatively, if a student's research performance is inadequate, the committee can support academic sanctions on the student, i.e. that the student is not in good academic standing.

After the closed-session meeting, the core thesis committee chair will prepare a brief report of the committee's assessment of the student's progress towards the thesis and present this to the student and Departmental Registrar: It is the student's responsibility to print and complete the top portion of the

Thesis Progress Report form prior to their meeting. The completed form should then be given to the Graduate Registrar along with an electronic copy of any written reports.

Preparing a Prospectus

Students are required to have their thesis prospectus submitted to the graduate school before the end of their third year in order to advance to candidacy and register for a fourth year. As described above, in “Core Thesis Committee”, the student must present their thesis prospectus to their faculty adviser and core thesis committee who must approve the thesis prospectus before it is submitted to the Physics Graduate Registrar’s office. Here is the approval form. A PDF copy of the thesis prospectus, along with the signed approval form, should be submitted to the Graduate Registrar no later than August 15th in order to avoid issues with registration.

The first page of the prospectus should contain the following information: title, student’s name, adviser’s name, Yale University Physics Department, and date. Prospectus should also include an abstract. The following is an excerpt from the Graduate School Programs and Policy Bulletin describing the prospectus:

The prospectus should be viewed as a preliminary statement of what the student proposes to do in his or her dissertation and not as an unalterable commitment. The appropriate form and typical content of a prospectus inevitably vary from field to field. In most cases, however, a prospectus should contain the following information:

1. A statement of the topic of the dissertation and an explanation of its importance. What in general might one expect to learn from the dissertation that is not now known, understood, or appreciated?
2. A concise review of what has been done on the topic in the past. Specifically, how will the proposed dissertation differ from or expand upon previous work? A basic bibliography should normally be appended to this section.
3. A statement of where most of the work will be carried out - for example, in the Yale library or another library or archive, in the laboratory of a particular faculty member, or as part of a program of field work at specific sites in the United States or abroad.
4. If the subject matter permits, a tentative proposal for the internal organization of the dissertation - for example, major sections, subsections, sequence of chapters.
5. A provisional timetable for completion of the dissertation.

Although it is difficult to prescribe a standard length for the prospectus, it should be long enough to include essential information for the proposed topics but not overly long. Seven to ten pages, excluding figures and bibliography, should be appropriate in most cases. The prospectus should be written in a manner comprehensible to people who are not experts in your particular subfield. A concise introduction to the subject is therefore essential.

Public Presentation

In addition to the private committee meetings, students can choose to present part of their annual research progress to their thesis committee in a public presentation which the core thesis committee members are expected to attend. Possible forums for such presentations include the Weak Interaction Discussion Group, The Monday Evening Seminar, the Sackler Discussion Group, collaboration presentations, group meeting presentations, etc. The format of the presentation should be a talk that lasts 30 minutes or more. The allowable format and content for the “public presentations” should be viewed broadly, subject only to the participation of the core thesis committee. Especially early on in their research career, to satisfy this requirement, it may be that it makes most sense for a student to make a journal club-type presentation in the context of a group meeting, later on progressing to a research-based presentation in one of the regularly scheduled series. It is also the student’s responsibility to arrange for this public presentation.

This public presentation is NOT meant to be merely a progress report for the core thesis committee, or an opportunity for the committee to ask physics questions about the work. Rather, the goal is primarily for the student to practice communicating in a public setting, and to receive feedback about how to improve their presentation abilities.

After the public presentation, the student will provide the core thesis committee chair with the Thesis Progress Report form so that they may enter comments regarding the student’s presentation. The completed form should then be given to the Graduate Registrar along with an electronic copy of any written reports. Once again, the focus of this report should be on presentation style rather than a comment on the scientific progress.

Annual Dissertation Progress Report

The Dissertation Progress Report (DPR) is due each May 1 for work done in the academic year just completed. Filling in the form is now an on-line process, please see Yale’s Dissertation Progress Report page. For students who advance to candidacy early in their 3rd year, they will also be required to submit a DPR by May 1st. These students should resubmit their thesis prospectus to satisfy the University requirement for DPRs.

Dissertation and Completion

Forming a Dissertation Committee

The Physics Department requires a 4-member Yale faculty committee plus an outside reader to approve a dissertation and defense for graduation. The core committee and DGS must approve the additional members prior to the student inviting the final faculty and outside reader to join their dissertation committee.

Typically, the Committee would include the members of the core thesis committee and one more faculty member. Two of the faculty members on the committee must have a primary or secondary appointment in physics, two must be from Yale, and two must be tenured. These requirements need not be satisfied by the same two people.

Usually, the make-up of the committee is as follows:

For students in an experimental field:

(1) Adviser and (2) another in the same experimental field; (3) another in the same field but theoretical; (4) another experimentalist (any field) and (5) approved outside reader

For students in a theoretical field:

(1) Adviser and (2) another in the same theoretical field; (3) another in the same field but experimental; (4) another theorist (any field) and (5) approved outside reader

Outside reader

The outside reader must be someone outside of Yale who has had no direct involvement with the student's dissertation analysis but who may be familiar with the student work and be someone who can be objective in their evaluation of the dissertation. The outside reader is usually selected by the student and their dissertation adviser and must be approved by the DGS. Students can, and often do, send the dissertation to their outside reader when they submit it to their committee, just prior to the defense to provide ample time for the outside reader to provide comments in a timely manner.Dissertation Defense

Once the Dissertation Committee is chosen and approved by the DGS, it is the student's responsibility to set the date, time and place for the defense at a time convenient to all members of the Committee. Copies of the dissertation should be given to them at least two weeks in advance. The Physics Registrar's office will assist in locating a room if necessary. The dissertation defense shall consist of two consecutive parts. The first part, which shall be open to anyone interested, will consist of an oral presentation of approximately one-hour in length, in the style of a research seminar. An announcement will appear in the weekly Seminar Notices. The second part will consist of detailed questioning of the candidate by the dissertation committee, at which attendance will be restricted to members of the committee.

Dissertation Requirements

The Graduate School has specific rules about formatting, etc. When you are preparing your final draft, you should consult their Dissertations page and Formatting Guide. Review the Dissertation section of *Programs and Policies* for the fine print about the dissertation process, reader committees, language requirements, and more.

Dissertation First Chapter

The Physics Department recommends that the first chapter of the thesis be a succinct summary of the entire thesis, including in particular:

- a brief review of the field prior to the thesis research to provide context
- a presentation of the goals and motivations of the thesis research
- a clear description of what the student has achieved in the thesis research (primarily written in the first person singular, but with due credit to others as appropriate). This description should refer back to (1) and clearly indicate the relation to prior work.

It may also make sense to add:

- suggestions for how to best build upon the thesis research in future work.

Otherwise these suggestions should appear in the conclusion of the thesis.

Submitting Your Dissertation

After the defense, the committee may ask the student to make some changes in the dissertation. These changes must be made before submission to the Graduate School. Alternatively, if you have already submitted your printed dissertation to the Dissertation office, you may replace single pages or chapters with minor edits. If major edits are required, a new printed dissertation may be submitted with the approval of the DGS or advisor.

Submission guidelines are posted on-line at the Graduate School's website: Dissertation Guidelines, Dissertation Checklist (under Resources), and Notification of Readers form. Remember to list your advisor as one of the 5 readers. Dissertations must be submitted to the Dissertation office by October 1st for December graduation or March 15th for May graduation.

Note: Students must be registered through the term of dissertation submission (unless they have already completed their sixth year).

Graduation Checklist

Once a student has completed writing their dissertation and is ready to graduate, there are departmental steps and university requirements to follow by the dates listed below.

Due by February 15th for May Graduation or September 1st for December Graduation

- Complete the Notification of Leave/Graduation online form to notify the office of your defense date, your last day in the lab and future contact information. Do not enter your current contact information unless you do not plan on moving for several months after graduation.
- Students are responsible for scheduling a date, time and physical or virtual room location for their thesis defense. Please give your committee members adequate notice when trying to schedule your defense. Defense information can now be included in your Notification of Leave/Graduation form.

- With the assistance of your advisor, find an appropriate outside reader and submit to the DGS for approval.

Due by March 15th or October 1st

- Provide the Thesis Progress Report Form to your dissertation committee members for signature during your defense. Forward your signed form(s) and a PDF copy of your Dissertation to the department registrar. See below for further Defense details.
- Review and complete the Yale GSAS Dissertation Submission Checklist.
- Enter your reader information into the Online Notification of Readers (ONOR) portal, and notify the Graduate Registrar when done.
- Submit your final dissertation to the Registrar's Office. See below for further submission guidance.

Prior to leaving

- Schedule a 30-minute Exit Interview with the Chair or DGS to talk about your experience in the program
- Update Notification of Leave/Graduation form with any new future employment or address changes
- Confirm last day of pay with Graduate Registrar
- Turn in any keys, coats, or other university provided equipment

These deadlines have been established to allow sufficient time for readers to make careful evaluations and for the department to review those evaluations before making our recommendation to the Graduate School on degrees earned. No extensions of the deadlines will be granted. Dissertations submitted after the deadlines will be considered during the following term.

Mentoring and Advising

Mentoring and Advising are critical components of academic life. Mentorship can happen "up, down, and sideways". Both advisors and mentors play critical roles in your path to success. Students are encouraged to talk with their advisors about all aspects of mentoring, including their academic success, path to dissertation, and post-graduation plans. Open discussion with your advisor about how each student can best be mentored are strongly encouraged. Reach out to the graduate team with any issues you face with respect to mentorship and talking with your advisor.

Successful mentoring on the part of Teaching Fellows to students, and to other researchers in your research groups is also critical to success. Reach out to the graduate team with any questions or issues you face in these roles as well.

Resources on mentoring and advising are listed below:

GSAS Guide to Advising for Faculty and students: Advising & Mentoring

Do you have all the mentoring roles you need for success? Try filling out this "Mentoring Map"

Other Issues

Registration Changes

Registration Deferrals

Students who wish to defer their first year of admissions should first have the approval of the DGS. Once the student has conferred with the DGS, they must email the registrar requesting their deferral of admissions and length of deferral. Incoming students typically defer for one academic year and can choose to begin their research the following summer as an Early Start applicant prior to the Fall start.

Leave of Absence (Personal, Medical or Parental)

Students who wish or need to interrupt their study temporarily may request a leave of absence. There are three types of leave, personal, medical, and parental. There are very important considerations about deadlines and about continuation of medical insurance for each type of leave, the details of which are described in the Graduate School Programs and Policies Bulletin. Students facing any type of personal or health difficulties are strongly encouraged to consult with the DGS and/or Dean.

Students must submit a completed Change of Status form to the department Registrar for Graduate School approval. Students who intend to petition for their Master's at the same time may do so if they have not already advanced to candidacy. Students are also required to complete the Notification of Leave/Graduation for departmental records.

Registration Extension

A student wishing to extend his/her registration beyond their original six year terminal date must file a Petition for an Extension. Extension forms can be found here. A Dissertation Progress Report must also be completed along with a letter to the DGS stating the reasons for needing an extension prior to the approval of your extension request. An extension can be requested for one or two terms. Extensions beyond the seventh year are not normally allowed.

Note: It is not necessary to be a registered student beyond your sixth year to be able to complete your dissertation and defend. However, you will not be allowed to receive AR salary, nor will you have health insurance if you are not registered.

Registration Withdrawals

Students who wish to leave the program may do so at any time. Prior to making the decision to leave, we strongly recommend that you speak to the DGS or Chair to evaluate all options. Students must submit a completed Change of Status form to the department Registrar for Graduate School approval. Students who intend to petition for their Master's at the same time may do so if they have not already advanced to candidacy. Students are also required to complete the Notification of Leave/Graduation for departmental records.

Vacation Policy

Students supported by external funding sources, must in all cases comply with the vacation policies associated with their funding sources. Beyond this, for students already in research groups, the total vacation time that a student may take is at the discretion of, and may be negotiated with, the thesis adviser. Students and faculty may consult the DGS with questions about vacation policy.

As a guideline, however, the Department expects that Physics students will take an average of two weeks' vacation per year, in addition to the stated University holidays and the Christmas Eve to New Year's Day break. This amounts to a total of about 4 weeks vacation annually. In this context, students are reminded that the first year of graduate school is when you are expected to transition from a "school" schedule to a full-time, self-motivated research schedule. Thus, for example, the period between the fall and spring semesters and Spring Break are each considered to be an active time of scholarship and research, and there may be specific teaching duties for those with teaching fellowships during these times. Student vacation should not conflict with academic or teaching obligations.

External Summer Internships

Normally, students who take time off from their studies to work full-time must take a leave of absence for the term or terms in which they are employed. However, certain summer internship opportunities may be beneficial to a student's academic development and career prospects. Therefore, under certain circumstances students may be permitted to remain registered at Yale while engaged in summer internships. To be eligible, the internship must meet several requirements listed on the Graduate School Academic Regulations page.

Complete the Request for Summer Internship form and submit it and the other required documents to the departmental registrar for DGS approval. A one page write-up is required prior to the internship being approved and once the student has returned from their summer internship.

International Students

International students should feel free to contact the DGS or Registrar regarding any issues they may have. For matters related to their Visa status, International Taxes, or preparing for travel, inquiries

should be addressed to the Office of International Students & Scholars (OISS) as they are your best resource for up-to-date information regarding all international related issues.

Financial Matters

Paychecks

First paycheck of academic year: August 31st

Paydays: Semi-monthly on the 15th of the month and the last day of the month.

When either of these days falls on the weekend, payday will be the last working day before either of those days (i.e. usually Friday but occasionally earlier on holiday weekends).

We strongly encourage the use of Direct Deposit. Direct Deposit gives you access to your funds immediately on payday. Please see the Workday FAQ for assistance setting up your direct deposit. Direct deposit should be sent up by the 10th of August for first year students to receive their first check via direct deposit. Students without direct deposit will have physical checks mailed to their home address listed on Workday. If you have any trouble accessing Workday, please notify the graduate registrar for assistance.

Taxes

Taxes are very complicated, especially for graduate students. Since individual circumstances vary on the basis of citizenship, tax treaty, year of study, and more, we recommend that you consult with a tax professional regarding your specific circumstances.

The University Tax Information page holds valuable information for U.S and International student tax issues. General tax questions can be referred to Employee Services.

Fellowship Opportunities

Fellowship opportunities are available to students through various outside organizations. The most common ones can be found on the Physics Fellowship Opportunities webpage. Students who receive outside funding from a fellowship or award are also guaranteed a $4000 annual salary bonus on top of their standard yearly graduate stipend.

Dean's Emergency Fund

To help terminal master's and Ph.D. students with unexpected one-time expenses such as travel

related to a death in the immediate family, temporary housing after a fire, or emergency dental surgery, the Dean's Office has set aside special funds. Eligibility and applications can be found here.

Parental Support and Relief

Registered Ph.D. students who wish to modify their academic responsibilities because of the birth or adoption of a child may request parental support and relief during or following the term in which the birth or adoption occurs. For more information, please see the GSAS Parental Leave Policies.

Vacation Funding

The Physics department expects that students will receive a stipend for vacation time up to an average of two weeks per year, in addition to stated University holidays and the Christmas-to-New Year's break.

First-year and second-year students, especially those starting research in a new research group, who wish to take vacation, are recommended to schedule their vacation for the last two weeks of May, after the student's academic commitments are finished and while the student is still supported on a University fellowship (which runs through May 31) and before the students' research commitments and funding begin on June 1.

Students, who nevertheless wish to take long vacations and obtain the permission of their research advisor to do so, will not receive a stipend during such vacations. However, especially in the case of international students, some of whom may wish to return home for less-frequent-but-longer visits, the department notes that a one-size-fits-all policy is not sensible and encourages faculty to be flexible in accommodating such requests as fairly as possible.

Summer Funding

Ordinarily, the Physics department expects students to carry out research and receive a stipend full-time during the three summer months. Stipends are paid by the research advisors. Students who have not yet found a summer research position by mid-March should consult with the DGS immediately to discuss research and funding options.

The Graduate School Programs and Policies bulletin states that "Continuing students who were registered during the preceding spring term and are engaged in degree-related activities at least half-time remain registered through August 31." It follows that, if a student does not find a summer research advisor or wishes to take a summer vacation that is longer than six weeks, the student becomes not registered as a Yale student in that period, and therefore must apply for a formal Leave of Absence.

According to Graduate School rule, in no case is it permissible for an advisor to insist that a student must take unpaid summer vacation.

Loans

Under certain circumstances, loans are available to students. Requests for loans should be made to the Graduate School Financial Aid Office for determination of eligibility. Visit their office at 129 HGS or call (203) 432-2739 for more information.

Yale Health Plan

Yale Student Health

All Ph.D. students are given a university fellowship for single coverage for health and hospitalization insurance. For a two person plan to include a spouse or a family plan, the Graduate School will pay 50% of the premium and the student is responsible for the other 50%.

Student Health coverage begins on August 1st and ends January 31st for students registered for the Fall term, this includes newly admitted students. Students registered for the Spring term are covered February 1 to July 31st. For students who graduate or leave the program, their coverage will continue to the end of their last registered term.

Health services are provided through the Yale Health Plan, 55 Locke Street. Please contact Member Services for more detailed information about coverage and services at 432-0246 or visit the University Health Services website.

Payne Whitney Gym

Payne Whitney Gymnasium, the largest building at Yale, is located at the north end of campus on Tower Parkway. Anyone affiliated with the University is eligible for membership. Yale students with valid I.D. cards are permitted open access to the building while other members of the Yale community are required to register and pay a membership fee.For specific schedule information on activities etc., please call the Information Desk at 432-1444. Membership information can be obtained by calling 432-2474.

Other Resources

- Academic Resources
- Well-Being Resources
- Physics Student Resources
- University Research Resources
- Departmental Resources

Academic Resources

Forms

Departmental Forms - All forms are now available online

- Notification of Leave/Graduation
- Special Investigation Proposal Form
- Special Investigation Evaluation Form
- Thesis Progress Report Form
- Qualifier Syllabus
- LaTeX template for Dissertation (please save as a .tex file by removing the .txt extension)
- LaTeX class file for Dissertation (please save as a .cls file by removing the .txt extension)

Graduate School Forms

- All Graduate School forms can be found on the University Registrar's Forms & Petitions webpage

Links

Academic

- Academic Calendar
- Dissertation Information
- Enrollment Verification
- Graduate School
- Notification of Readers Form
- Office of International Students & Scholars
- Online Course Information
- Petition for Degree
- Physics Graduate Course List
- Programs and Policies
- Register On-Line
- Teaching Evaluations
- Transcripts
- Yale University Student Systems (change address, etc.)

Research

- Applied Physics
- Earth and Planetary Sciences
- Molecular, Cellular and Developmental Biology
- Molecular Biophysics and Biochemistry
- Physical Engineering Biology
- Physics Department Fields of Research
- School of Engineering

Living

- Direct Deposit of Paychecks (done through Workday)
- Graduate Housing Office
- Health Plan
- ID Center
- Information and Technology Services
- International Tax Office
- McDougal Center Office of Student Life
- Parking and Transit
- Social Security Number Application Information
- Student Financial Services
- Tax Help for International Students
- Visitor Center
- USPS Yale Station (for parcel pickup)

Post Graduation

- Association of Yale Alumni
- Office of Career Strategy
- Career Services Alumni Network

Calendars and Directories

- Physics Department Calendar
- Physics Department Directory
- Physics Outreach Events Page
- Yale Directory
- Yale Graduate School Academic Calendar
- Yale Events Calendar
- New Haven Events Calendar

Well-Being Resources

Comprehensive list of departmental and University Resources to address Discrimination, Harassment, and Mental Health Concerns.

Physics Student Resources

Departmental Colloquia and Seminars

You will receive an e-mail notice each week with the next week's Seminar Schedule which is also available online.

- Physics Club Colloquia are held on Mondays at 3:30 pm in 57 SPL with tea and cookies after the talk. This is an important weekly event that will help you decide what subfield you are interested in and keep you informed concerning what is happening in other subfields of Physics. All Students are expected to attend.

Other activities

- Department teas will be held from 3:30-4:00 p.m. on Mondays (before the Physics Club Talk)
- Graduate Student Happy Hour held monthly during the academic year.

Graduate Student Advisory Committee (GSAC)

The Graduate Student Advisory Committee serves as a point of communication between the graduate students and the administration of the department. The committee advises the Chair, the DGS, and other faculty on matters related to graduate students and the graduate program, including (but not limited to) helping plan and organize annually scheduled departmental events. The committee members also advocate on behalf of graduate students with the Chair and DGS. Committee members are appointed for one calendar year. The composition of the committee includes at least one representative from each cohort, with a primary goal of representing inclusive and diverse sets of interests. Committee members meet with the Chair and DGS once a month. The committee also meets internally once a month while regularly soliciting feedback from other students in their cohorts.

Graduate Student Assembly (GSA)

The Graduate Student Assembly (GSA) is an elected body of students in the Graduate School of Arts and Sciences that participates in Graduate School policy making relevant to matters of their education and their lives as students.

The Assembly's goals are to:

- identify the needs and concerns of graduate students, consider possible solutions, and present these to the Dean and other administrators.
- discuss and advise on changes to Graduate School policy proposed by the administration.
- provide a means for communication and deliberation both among and between graduate students and other members of the university community.

Recent accomplishments of the GSA include:

- implementation of a Conference Travel Fund (CTF) that provides awards to students allowing them to present their research at conferences.

- improvements to the Yale transit system (Central Science Loop, nighttime shuttle changes).
- the elimination of the summer gym fee for all graduate and professional students.

Current issues being adopted by the GSA include:

- the accessibility of child care at Yale.
- lobbying Congress for the reduction of federal income tax on graduate students.

The GSA welcomes new ideas, issues and concerns raised by students. If you have suggestions for changes or improvements to policies and services, please bring it to our attention by attending a meeting, or contacting a representative. Information about meetings can be found on the GSA website. Meetings are open to ALL graduate students. You may contact the assembly directly at graduate.student.assembly@yale.edu.

Graduate School Advising & Mentoring

Resources for finding formal and informal advisors. Advising & Mentoring

McDougal Graduate Student Center

The McDougal Center, located at 135 Prospect Street, has services and facilities designed specifically for graduate students and post-docs. Created in 1997 through a generous gift from Alfred McDougal '53 and his wife Nancy Lauter.

The Center is a great physical space with a Common Room and Coffee Lounge equipped with free coffee, tea, and water (bring your own mug), a lounge space, widescreen TVs, and magazines. Just outside, you'll find the Caulkins Courtyard and the Swenson Terrace. The offices for staff and fellows of McDougal Graduate Student Life are in the McDougal Center, along with satellite offices of the Office of Career Strategy (OCS), and the Office for Graduate Student Development and Diversity (OGSDD).

Visit the McDougal Graduate Student Center website for information on events and activities or call 432-BLUE (432-2583)

Go to McDougal Graduate Center - Calendar of Events.

Office of Career Strategy (OCS)

The Office of Career Strategy (OCS) is a comprehensive career center for students and alumni/ae of Yale University's Graduate School of Arts and Sciences and for postdoctoral fellows. Through individual counseling, programs and a library of online resources, the office assists graduate students and alumni/ae with non-academic career planning and decision-making. OCS encourages students to begin using the services of the office early in their graduate careers in order to expand the choices they will have upon completion of their degrees. For more information visit http://ocs.yale.edu.

Office for Graduate Student Development and Diversity (OSGDD)

The Office for Graduate Student Development & Diversity coordinates efforts to recruit and retain students from diverse backgrounds, including minorities, women, and other underrepresented groups at the Graduate School. The office supports the needs of these students as they pursue graduate study and implements a wide array of academic and social programs. These services are available to all graduate students in an attempt to foster a sense of understanding and respect among all students, while simultaneously creating a more inclusive campus community. In addition, OGSDD administers the Summer Undergraduate Research Fellowship (SURF) Program.

Office of International Students & Scholars (OISS)

The Office of International Students & Scholars provides assistance to all non-U.S citizens including Immigration, Travel, Taxes and more.

University Research Resources

Library Resources for Physics

The Yale University Library contains a wealth of resources, from electronic journals to historical manuscripts from scientists such as Newton and Copernicus. You may access materials from any library collection through the library's main website, http://library.yale.edu.

Electronic Library Resources

Your subject librarian, Kayleigh Bohémier, curates a guide to databases, ebooks, and other electronic materials most useful to your Physics research. Please visit http://guides.library.yale.edu/physics, which is grouped into tabs for easy resource navigation.

Physical Library Resources

Your closest library location, the Center for Science and Social Science Information, provides access to many resources. All rooms are available for booking via the CSSSI's main page, http://csssi.yale.edu.

- Presentation practice rooms with video recording equipment and video conferencing abilities;
- Small rooms seating 4-6 individuals with MediaScape technology, allowing you to connect multiple computers to the same screen for group discussion;
- Computers with scientific and statistical software;
- Access to StatLab consultants, many of whom have training in MATLAB and LaTeX: http://statlab.stat.yale.edu;
- Access to the 180,000 volume on-campus collection of science and social science books.

Please note that the Math, Chemistry, and Geology collections are primarily housed in departmental libraries elsewhere on campus.

Research Assistance

Kayleigh Bohémier, Science Research Support Librarian, is your subject librarian. Feel free to talk to her about citation management, accessing library resources, or best practices for finding information on your research topic. Her skills include search strategies in ADS, Google Scholar, and INSPIRE, but also bibliography and citation management tools such as BibTEX, Mendeley, and Zotero.

She can be reached at kayleigh.bohemier@yale.edu or 203-432-9519. Feel free to stop by her office in CSSSI C41 or drop in during the open hours listed on her LibGuide profile: http://guides.library.yale.edu/profile/kayleigh-bohemier.

Professional Resources

Students who are not already members of the American Physical Society are encouraged to join. In addition to giving you the privilege of submitting talk abstracts to meetings, you will receive a subscription to Physics Today, a useful magazine for acquainting yourself with forefront research areas.

Software Library

The university software library is available on line for downloading software for which the university has a license.

Departmental Resources

General Resources

Computers and Printers

Wireless access is available throughout the Department.

There is a printer for your use in SPL 58/76. This is a Dell 5330dn laser printer with IP address 128.36.107.161. Your departmental laptops are already configured to use this printer. Paper supplies are kept in the SPL Mail Room.

Local department IT support is provided by Andrew Currie in room SPL 68D on the second floor. Please contact Andrew with any problems you may have regarding departmental computing or your laptops. Andrew can be reached at andrew.currie@yale.edu or physics.support@yale.edu.

Copy Machine

The copy machine located in 37 SPL, is for your use to copy teaching materials if you are assigned a T.A. position. You will be given a code number at the beginning of the term. In general, this copier is not for personal use. However, we can accommodate your personal copies on an infrequent basis for small jobs (see Graduate Registrar for code number). For larger personal jobs, we can make arrangements for copy charges. A copier is available at The Center for Science and Social Science Information (CSSSI) in Kline Tower; a prepaid copy card can be purchased at the library.

Facilities

All problems and concerns regarding the Physics buildings, such as doors or locks, should be reported to the Department Manager. Please do not hesitate to bring a problem to their attention. A small problem left unresolved can become a big problem if not taken care of in a timely manner.

Keys

Students are issued keys as necessary. Please see Maria Foley in 34 SPL. When you terminate your studies and leave the university, all keys should be returned. The building is normally locked from 5:00 p.m. to 8:00 a.m. and accessible only with your Yale ID.

Kitchen Facilities

Students may use the refrigerator and microwave located in the kitchen on the third floor (adjacent to the Lounge). The air pot coffee machines are not available for your use other than for getting hot water. This is a community kitchen (and used for department events as well) so mark your refrigerated items with your name.

For a small fee, coffee and espresso are available to students during normal business hours in 33 SPL.

Mail

You will be assigned a mailbox in 37 SPL. This box will be for Campus Mail and department notices only. These boxes should not be used for personal mail. Your postal address should be where you reside; if you reside in the graduate dorms, you will need to obtain a Yale Station U.S. postal mailbox.

Parking

Several parking lots are located near the Department of Physics. Follow the link for information on rates, lot locations, regulations and forms. There is a fee for parking during standard business hours; parking is free for students in the evening and on weekends and holidays.

Room and Laboratory Assignments

Entering students are assigned a desk usually in room 76 SPL for use during their first year. Each desk has a lock so you may store personal belongings. Please do not leave belongings unattended on top of your desk.

Second year students are usually assigned a desk in either room SPL 75 or SPL 77 if they do not have a space with their adviser's research group.

For safety reasons, small appliances, such as hot pots or coffee pots, may not be used in any of these office areas.

Once you begin working with an adviser, your work and laboratory space will be assigned by your adviser.

Security

As a general precaution, use good judgment when placing your belongings in the classrooms and labs or your desk space/office.

Please keep your desk locked if you are storing anything of value, i.e. textbooks, laptop computer etc. Also, wallets, purses and cell phones should not be made visible to others who may enter an office or lab area when no one is present.

For security reasons, if you encounter a problem with any lock or entry/exit door to the Physics buildings, please notify our Department Manager so that the problem can be fixed.