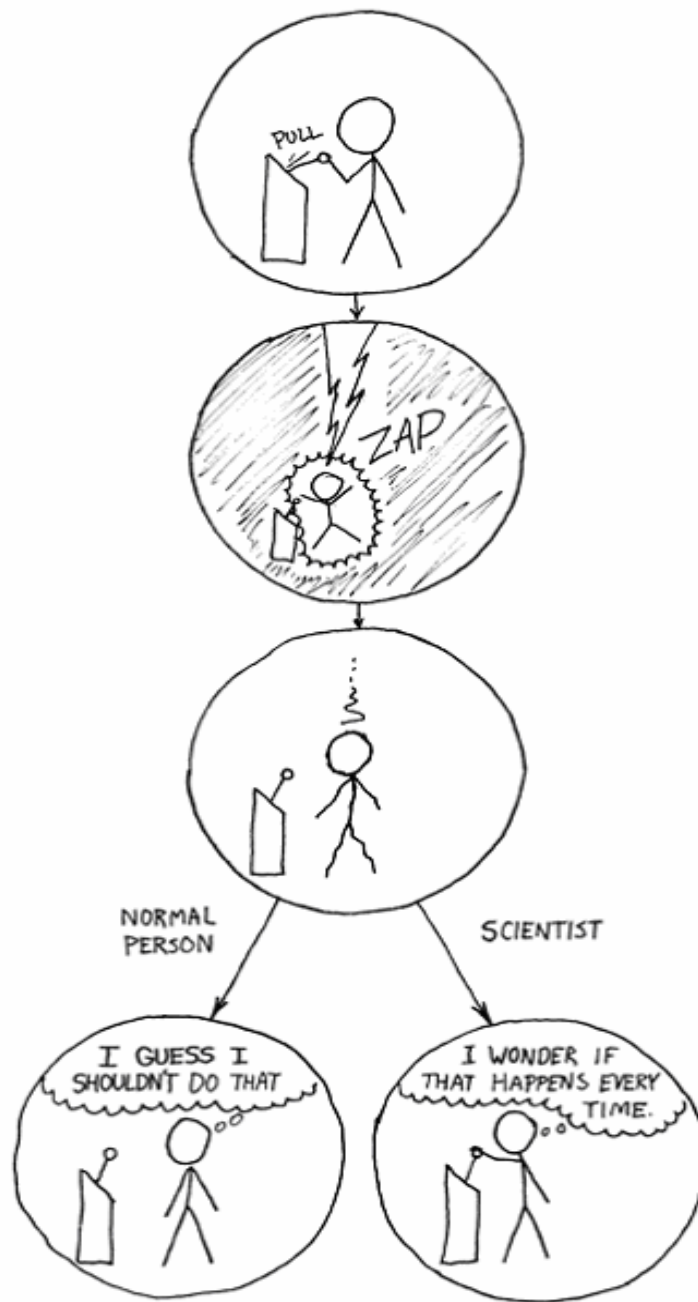


# Stanford Physics

## *Graduate Student Handbook*

### 2008-2009



Cartoon courtesy of <http://xkcd.com>

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September 2008

Dear Graduate Student,

Welcome to the Stanford Physics Department. This handbook should answer many questions you may have about the department and the program. If you have additional questions please do not hesitate to contact me. I look forward to working with you during your graduate career.

Sincerely,  
 Maria Frank  
 Student Services Officer

\*\*\*\*\*

**PHYSICS MAIN OFFICE**

Hours: 10 am - 12:00 pm & 1 pm - 4:30 pm, Monday through Friday  
*Closed for lunch from 12 - 1 p.m.*

Below is a list of Physics Department main office staff, contact information, and a short list of areas of responsibility. If you have questions, feel free to ask any staff member.

NAME	TITLE	E-MAIL	PHONE	OFFICE
<b>Rosenna Yau</b>	Administrative Services Manager	<a href="mailto:rosenna.yau@stanford.edu">rosenna.yau@stanford.edu</a>	3-4345	Varian Main Office, Rm 110
<b>Cindy Mendel</b>	Office Manager	<a href="mailto:cmendel@stanford.edu">cmendel@stanford.edu</a>	3-4346	Varian Main Office, Rm 111
Works with faculty to process research grants and contracts and oversee the financial accounts in the department; handles HR issues, processes pay distribution and all temporary student appointments.				
<b>Jenifer Conan-Tice</b>	Administrative Associate, Faculty Affairs	<a href="mailto:tice@Stanford.edu">tice@Stanford.edu</a>	3-4347	Varian Main Office, Rm 105
Students may contact Ms. Conan-Tice in the Physics Main Office to arrange meetings with our Department Chairman, for textbook inquiries or for general questions about the department.				
<b>Maria Frank</b>	Student Services Officer	<a href="mailto:maria.frank@stanford.edu">maria.frank@stanford.edu</a>	3-0830	Varian Main Office, Rm 106
Responsible for administration of the Graduate Program; processes RA/TA stipends, tuition and fellowships, qualifying exams, graduate student progress, milestones, graduate admissions, etc.				
<b>Elva Carbajal</b>	Undergraduate Program Coordinator	<a href="mailto:elva@stanford.edu">elva@stanford.edu</a>	3-4362	Varian Main Office, Rm 107
Oversees undergraduate program, assigns teaching assistants; schedules courses; maintains department bulletin copy; administers the Undergraduate Program; coordinates the recruitment, hiring and placement of graduate students as course teaching assistants (TAs) for undergraduate courses.				
<b>Violet Catindig</b>	Administrative Associate, Main Office	<a href="mailto:vvc@stanford.edu">vvc@stanford.edu</a>	3-4344	Varian Main Office, Rm. 108

Responsible for key distribution, purchasing card, petty cash, and answering student inquiries.

For additional information on facilities, colloquium listings and other department events/services please see our department website at <http://www.stanford.edu/dept/physics>

## **YOUR CONTACT INFORMATION**

All students must enter current phone numbers and email addresses into the AXESS system. The information will be used for the graduate student phone list and you will receive important program information via email. Please update your contact information at <https://stanfordyou.stanford.edu/main/home>.

## **ACADEMICS**

### Advising

Professor David Goldhaber-Gordon is the Chair of the Physics Graduate Study Committee for 2008-09. He will serve as the official advisor to all graduate students and is available to consult with students about any graduate student related matter including degree progress. In addition, in their first year, students have a program advisor selected by the department to advise on courses and rotations, and sometime during the first year students will select a research advisor who will direct their research program. When students start work on their dissertations, the research advisor becomes their main advisor. Professor Goldhaber-Gordon is available to meet with students by appointment.

### Co-Advisors

Physics graduate students have a wide range of research choices available to them, including working on a Physics-related program in a different department, with a research advisor who is not a member of the Physics Department. Students working with advisors outside Physics/Applied Physics/SLAC must have a co-advisor who is a faculty member in the Physics Department. A co-advisor serves two main roles: (I) acting as an official liaison for the student to the Physics Department and (ii) insuring that the student's dissertation has a physics component that is sufficient to allowing granting of a Ph.D. in Physics. The co-advisor also serves as the student's contact to the department for any academic issues that would be more appropriately dealt with by Physics, rather than a faculty member in another department.

Students should select the co-advisor as soon as he/she is no longer on rotation and has decided on a research program with an advisor in a department other than Physics. In any case, this should be no later than the end of the second year of graduate study. Students should complete the "Advisor/Co-Advisor" form (available in the Physics Main Office) and submit it to the Physics Student Services Officer, Maria Frank.

During the third year the student submits a one-page dissertation proposal on his/her research, including a description of the physics components, to Maria Frank. The proposal should have been reviewed, approved and signed by the student's research advisor and co-advisor.

From then on, the student is required to meet with his/her co-advisor on a yearly basis, although more frequent meetings are encouraged. During that annual meeting, the student submits a one-page progress report on research for co-advisor approval and signature. The form is given to the Maria Frank for placement in the student's file.

If, during the annual meeting, the co-advisor determines that the research no longer contains a significant physics component, the student will be warned that a Ph.D. in Physics may not be merited and he/she may need to transfer to the relevant department.

### Minor

A minor in another department must be approved by that department, using the “Minor Requirement for Ph.D. Candidate” form. Your plan must also be approved by the Chair of Graduate Studies. Please see the [Stanford Bulletin](#) for more information.

### Master's Degree

The department does not offer a co-terminal degree program, or a terminal M.S. degree. However, the M.S. degree may be awarded for a portion of the Ph.D. degree work. See the [Stanford Bulletin](#) for information on obtaining the M.S. degree. The required forms are available at <http://registrar.stanford.edu/pdf/progpropma.pdf> and <http://registrar.stanford.edu/pdf/gradprogauthpet.pdf>.

## **REQUIREMENTS FOR THE PH.D.**

### **COURSE WORK**

The following courses are required for completion of the Ph.D. in Physics at Stanford.

#### **CORE COURSE REQUIREMENTS**

Physics **210** (Advanced Particle Mechanics) **or 211** (Continuum Mechanics)

Physics **212** (Statistical Mechanics)

Physics **220 & 221** (Classical Electrodynamics)

Physics **230 & 231** (Quantum Mechanics)

Physics **290** (Research Activities at Stanford)

Physics **294** (Teaching of Physics at Stanford)

#### **BREADTH REQUIREMENTS**

**Students must also take one course in at least two of the following four areas, chosen from Physics Department courses numbered above 232 with the exception of 290 and 294:**

Condensed Matter

Quantum Optics & Atomic Physics

Astrophysics & Gravitation

Nuclear & Particle Physics

Biophysics

A “B” grade point average must be maintained for all departmental requirements.

All Ph.D. candidates should have math proficiency equivalent to the following Stanford courses: Math 106, 113, 114, 131, and 132. Advanced math courses are especially useful for theoretical work.

Students who can demonstrate that they have taken the equivalent course elsewhere with the necessary grade will be granted a waiver to complete that course by the Graduate Studies Committee. A petition form to waive a course requirement can be found here: <http://www.stanford.edu/dept/physics/academics/RA/GradCourseWaiverPetition.pdf>. A separate form for each course must be filled out. The procedure to waive a course is as follows. First, meet with the instructor for the course to be waived and provide him/her with a description of the course that you took, including the textbook name and the syllabus. If the instructor agrees then he/she will sign your waiver form. Give the petition with a copy of your transcript to Maria Frank who will then pass it on to the Graduate Study Committee for final approval.

**Students are strongly encouraged to complete or waive course requirements as soon as is practical in their graduate careers**, but no later than the end of your second year. This lessens the possibility of delays in the granting of a degree or in transferring to TGR status with its lower tuition rate. Note that most physics courses, including the core courses, are only offered once in each academic year and the more advanced courses may only be offered every other academic year. Advanced planning is to your benefit.

## TEACHING

The department believes that a demonstrated ability to teach is an important part of a graduate-level education in Physics. Consequently, three quarters of teaching are a requirement for the Ph.D. in physics. Teaching duties vary from course to course but can include leading discussion sections, laboratory sections, meeting with students informally through office hours, and grading homework and exams. To meet the requirements, at least two of the assistantships must be for a lecture course in which the Teaching Assistant (TA) conducts a weekly discussion section.

A TA application form must be completed before any quarter in which a student wishes to teach. The form made is available online a few weeks prior to the end of the preceding quarter on the Physics Department website <http://www.stanford.edu/dept/physics/academics/index.html>. The Undergraduate Program Coordinator is responsible for TA assignments and will notify students of application availability and deadlines.

First year graduate students are given first priority for TA positions. Next (from highest to lowest priority) are other Physics graduate students and Applied Physics graduates. On rare occasions we assign TA positions to qualified applicants from outside the Physics/Applied Physics departments.

## GRADING

Occasionally the department needs graders for courses. Grading positions provide an hourly wage, do not pay any tuition allowance and cannot be used to fulfill the teaching requirement. Graders may work a maximum of 8 hours per week, but international students may not work as graders during the academic year if they have a 50% RA, TA or combined RA/TA appointment. Rules are slightly different for summer quarter. See Maria Frank or Elva Carbajal if you have further questions about grading positions.

## **ENGLISH PROFICIENCY FOR TEACHING ASSISTANTS (*International Students Only*)**

The University requires that International graduate students who wish to be appointed as TAs must first be screened by proficiency in the English language. The screening is conducted by the English for Foreign Students Program in the Stanford [Language Center](#). The Language Center also offers courses in English as a second language (ESL) to international graduate students. More information on the screening exam can be found at <http://www.stanford.edu/group/efs/tascreen.html>. We strongly recommend students to get screened at least one quarter prior to the quarter in which they wish to TA.

## **QUALIFYING EXAM**

The Physics Department faculty believe that in addition to demonstrating ability to conduct original research in a specific area of concentration, our Ph.D. students should be able to demonstrate a broad understanding of Physics at the advanced undergraduate/ beginning graduate student level.

As a means of demonstrating their broad knowledge, graduate candidates are required to pass the physics qualifying examination. This is a written examination held over two days, covering Particle Mechanics, E&M, Quantum Mechanics, Statistical Mechanics and Thermodynamics, Special Relativity and General Physics.

Preparation for this comprehensive exam gives students an opportunity to review and synthesize this broad range of material, and to amend any deficiencies in their undergraduate preparation. Evaluation of this examination gives the faculty a formal method of gauging this preparation, and for recommending remedial study when appropriate. Passing the qualifying exam is a required step in advancement to candidacy for the Ph.D. degree.

The qualifying exam is intended to cover material at the level of advanced undergraduate physics classes at Stanford. The following textbooks reflect this level in each subject area covered on the qualifying exam:

Classical Mechanics: "Classical Dynamics of Particles and Systems",  
J. B. Marion and S. T. Thorton

Electricity and Magnetism: "Introduction to Electrodynamics",  
D. J. Griffiths

Quantum Mechanics: "Introduction to Quantum Mechanics",  
D. J. Griffiths

Statistical Mechanics: "Fundamentals of Statistical and Thermal Physics",  
F. Reif



Special Relativity: "Space and Time in Special Relativity",  
N.D. Mermin

**Or**

"Special Relativity",  
A.P. French

First year graduate students are required to take the physics qualifying exam in the January immediately following their arrival at Stanford. There are many ways that students can prepare for the exam:

- Reviewing your undergraduate material in the relevant area
- Reviewing previous qualifying exams at <http://www.stanford.edu/dept/physics/publications/oldquals/>

With appropriate preparation and study, the majority of students can expect to pass the qualifying exam on the first attempt. Students who do not pass the exam in their first year can choose from one of the following:

(1) Retake in the second year sections of the exam in which they performed poorly and pass all questions in those sections. The questions to be retaken will be determined by the Chairs of the Qualifying Exam Committee, the Physics Department and the Graduate Studies Committee. Students retaking only parts of the qual will be allowed as much time as necessary to answer the questions but that time will not exceed the maximum allowed for the qualifying exam.

(2) Retake the entire qualifying exam and correctly answer the number of questions that is considered passing for that particular year.

In exceptional cases, for example if a student is deemed to have had insufficient undergraduate preparation, students may be allowed to take one or more recommended undergraduate courses as a substitute for retaking the exam. This option is decided entirely at the discretion of the Chairs of the Qualifying Committee, the Graduate Studies Committee and the Undergraduate Studies Committee, who will also decide the courses. In this case students must receive a grade of A- or higher in the courses selected, or they will have to retake the qualifying exam at the next available opportunity.

If the student does not pass the exam the second time, he/she will be asked to leave the Ph.D. program.

## UNIVERSITY REQUIREMENTS

### *Continuous Registration*

Students must be registered for **10** units of coursework and/or research (PH 490) every term during the academic year (Autumn, Winter and Spring quarters.) Registration procedures may be slightly different during summer term, but you will receive instructions at the end of spring term on how many units to register for during the summer, depending upon the percentage of your summer RA appointment. If you plan to be away from campus for an extended period of time you need to fill out a leave of absence form officially approved by your advisor, the Physics Department, and the Degree Progress Office during the quarter before the requested leave. Note that fieldwork directly related to your thesis does not require you to take a leave of absence.

### *University Unit Requirements for the Ph.D.*

The University requires students studying for the Ph.D. to complete 135 units of study. Students who have completed 135 units must then apply for Terminal Graduate Registration (TGR) status, which usually happens in the fourth or fifth year of study and is discussed further on page 12. Note that your 135 units **must include** all courses required for the Physics Ph.D. unless you have specifically waived them.

### *Registration Procedures*

In fall, winter, and spring quarters, students register for 10 units via AXESS. Units are a mixture of course units and research units (course 490) as appropriate. 50% support TA and RA appointments, and NSF fellowships include a tuition allowance for the 10-unit tuition rate. Some outside fellowships include full tuition (18 units); refer to your fellowship award letter or contact Maria Frank if you have questions.

In summer quarter ONLY, students in year 2 and above can receive up to 75% RA support and in year 3 and above, up to 90% if approved by the advisor. **Students in year 1 are only eligible to earn 50% RA or RA/TA support in summer quarter.** Registration unit levels for summer quarter are slightly different than in fall, winter and spring. The amount of tuition allowance you receive depends upon the percentage of your appointment. For example, if you work as a 75% research assistant, you receive 5 units of tuition support and should only register for 5 units. Detailed information regarding summer registration is sent to students via e-mail at the end of spring quarter.

TGR students register for Physics **802** (TGR Dissertation) for 0 units.

### *Advancement to Candidacy*

Advancement to candidacy is a very important step, with both departmental and university requirements. Departmental requirements include (i) passing the Physics Qualifying Exam and (ii) completing all required core courses. Note that financial support may be delayed if you do not advance to candidacy by July 1 of the second year. The *Application for Candidacy for Doctoral Degree* can be found here: <http://www.stanford.edu/dept/registrar/pdf/appcanddoct.pdf>

### ***Extension of Candidacy***

Ph.D. candidate status is good for five years. You may see your candidacy expiration date in AXESS by viewing your unofficial transcript. If your candidacy has expired, the following form should be completed and submitted to your department for approval:

<http://www.stanford.edu/dept/registrar/pdf/appcandextens.pdf> The Physics Student Services Office will contact you to remind you of candidacy expiration dates.

### ***Leave of Absence***

Leave of absence petitions can be obtained here:

<http://www.stanford.edu/dept/registrar/pdf/leaveofabsence.pdf>.

### ***Length of Leave***

All leaves of absences are granted for a fixed period of time, normally one year or less. Students who have completed all residency requirements (including advancement to candidacy) may request an additional year of leave if special circumstances exist. If no approved extension is on file, a hold is automatically placed on future registration. A student who wishes to return at a later date must file for reinstatement and an extension of candidacy. This applies whether it is the same major and degree program or a different one.

### ***Status While on Leave***

Students on approved leave retain their current degree program status but are not considered officially registered. No official departmental or University requirement, e.g., University oral examination, may be met while a student is on leave. However, an incomplete course grade may be submitted when a student is not registered. Also, a student may file a request to change major or degree level while on leave.

### ***Resignation***

A student who wishes to terminate study in a program should submit an official statement of resignation to the Student Services Officer, who will forward the information to the Registrar. A student who has resigned and later wishes to return to the same degree program must follow the normal procedure for reinstatement.

### ***Inactive Status***

A student who has not resigned and fails either to maintain registration or to secure a formal leave of absence will be declared inactive. A student whose candidacy is not extended is also considered inactive. If a student wishes to resume study either in Physics or a different field, he/she must apply for reinstatement. Reinstatement is not automatic and must be approved by the Department.

### *Terminal Graduate Registration (TGR) Status*

Being on TGR status significantly reduces your tuition. While on TGR, you need to register for PH 802 for "0" units. Note, you **must** fulfill the physics department course requirements before you can go TGR.

The Humanities and & Sciences Dean's office requires students with 135 units to apply for TGR status. TGR tuition rates are much lower than the 10-unit rate. When students with assistantships are eligible for TGR status, TGR tuition rates will be paid. This usually occurs in the 4th or 5th year. **Be sure to complete all required courses, including writing courses for foreign students, during the fourth year of study.** If you have fulfilled residency requirements for TGR status and still need to take courses, you may take up to three units of coursework with no financial penalty. You will be required to pay for any additional units above and beyond the approved three. Applications for TGR status are available in the Physics Main Office and at <http://www.stanford.edu/dept/registrar/pdf/tgrreq.pdf>. Before applying for TGR status, please check your transcript and confirm that you have received a grade or mark (C or NC, for example) for **every** course you have taken at Stanford.

### *Reading Committee*

The Doctoral Dissertation Reading committee consists of the principal dissertation advisor and two other readers. At least one member must be from the student's major department. Normally, all members are on the Stanford Academic Council.

The student's department Chair may, in some cases, approve the appointment of a reader who is not on the Academic Council (via the Petition for Doctoral Committee Members form), if that person is particularly well qualified to consult on the dissertation topic and holds a Ph.D. or equivalent foreign degree. A minimum of two Academic Council members must be on all reading committees.

Former Stanford Academic Council members, emeritus professors, and non-Academic Council members may serve on a reading committee. If they are to serve as the principal dissertation advisor, however, the appointment of a co-advisor who is currently on the Academic Council is required.

The reading committee, as proposed by the student and agreed to by the prospective member, is endorsed by the Chair of the major department on the doctoral Dissertation Reading Committee form: <http://registrar.stanford.edu/pdf/docrdngcomm.pdf>. This form must be submitted before approval of Terminal Graduate Registration (TGR) status or before scheduling a University oral examination that is a defense of the dissertation. The reading committee may be appointed earlier if desired. All subsequent changes in the composition of the reading committee must be approved by the Chair of the Ph.D. major department prior to submission of the dissertation (via the [Change of Adviser or Reading Committee Member](#) form).

### ***Oral Examination***

The University Oral Examination is a requirement of the Ph.D. degree. The purpose of the examination is to test the candidate's command of the field of study and to confirm fitness for scholarly pursuits. Departments determine when, after advancement to candidacy the exam will be given. It may be a test of knowledge of the field, a review of the dissertation proposal, a defense of the dissertation, or a combination of these functions.

The University Oral Examination committee consists of at least five members: four examiners and a committee Chair. At least two examiners must be members of the Stanford Academic Council (Professor, Associate Professor, or Assistant Professor). Examiners who are not on the Academic Council may be appointed if they contribute an area of expertise not readily available from the Stanford faculty. Emeritus faculty are eligible to serve as examiners or chair of the committee. The Chair must be a member of the Stanford Academic Council and may not have a full or joint appointment in the same department as the candidate or her/his advisor. Members of the Dissertation Reading Committee normally serve as examiners as well.

Students must be registered in the quarter in which the University oral examination is taken. Candidacy must also be valid. The Doctoral Dissertation Reading Committee form must be submitted to and recorded by the department prior to scheduling the examination. An abstract of the dissertation must be provided prior to the defense.

The University Oral Examination Schedule form is used to officially schedule the examination and includes:

- Date, time and location of the examination
- Title of dissertation
- Composition of the committee, approved by the department Chair

This form, available at <http://registrar.stanford.edu/pdf/oralsform.pdf> should be submitted by the student to the department Student Services Officer *at least two weeks prior to the examination date*.

### ***Writing the Dissertation***

Students work with their advisor(s) in planning and preparing the thesis. For detailed instructions see: <http://www.stanford.edu/dept/registrar/pdf/docdissdir.pdf>. Contact the Graduate Degree Progress Office with additional questions: 723-3056.

### ***Conferral of Degree***

To be cleared for conferral of the Ph.D. or Master's degree, you must file the "Notice of Intention to Complete Advanced Degree Requirements" form via AXESS by the due date indicated on the Registrar's Office website. Check with the Student Services Officer to make sure all requirements have been met and all grades have been cleared.

### ***Commencement Ceremony***

If you wish to receive your diploma at the Commencement ceremony in June, you must file the "Notice of Intention" form. Students who do so will receive information about the ceremony from the Registrar. Please note that the deadline to file the "Notice of Intention" form changes each year. Check with the Registrar's office for the current deadline.

Stanford allows students to "walk through" Commencement. This means that you may participate in the Commencement ceremonies if you plan to complete all the requirements for your degree the quarter following the commencement ceremony. To be eligible to walk through you must submit the walk-through petition, available here <http://registrar.stanford.edu/pdf/walkthrough.pdf> to the Student Services Officer at least two weeks prior to the commencement ceremony date in June.

### ***Grades***

It is your responsibility to check grades in AXESS each quarter to make sure they have been correctly reported for every term you have registered at Stanford. See your instructor about grade disputes and missing grades, and see the Student Services Officer about the procedure for grade changes. Be sure that Incomplete ("I") and Continuing Course ("N") grades are cleared when courses are completed. "I" grades will be changed to Not Passed ("NP") after one year.

### ***Credit for Graduate Work Done Elsewhere (Graduate Residency Credit)***

After at least one quarter of enrollment, students pursuing a Ph.D. may apply for credit for graduate work done at another institution if that work meets the established eligibility criteria. Note that transfer units cannot be used towards a Master's degree. No more than 45 units of transfer credit may be applied towards a Ph.D.

The eligibility criteria for coursework accepted for transfer credit are specified in the *Stanford Bulletin*. The *Petition for Graduate Residency Credit* is reviewed by the department and the Degree Progress Office.

Students enrolled at Stanford who plan to study elsewhere during their degree program should obtain prior approval of any anticipated transfer residency credit before their departure. Petitions for graduate residency credit are available here: [http://registrar.stanford.edu/pdf/grad\\_res\\_credit.pdf](http://registrar.stanford.edu/pdf/grad_res_credit.pdf)

### ***More Information***

See the Stanford University Bulletin, <http://www.stanford.edu/dept/registrar/bulletin/> for further information on University requirements, grading policies, course adds, drops, withdrawals, etc.

## MILESTONES

The usual schedule for physics graduate students consists of two years of course work, plus research training, leading to the dissertation and Ph.D. degree. Although there are exceptions, a well-prepared graduate student should complete the dissertation within five years after qualifying for candidacy, i.e., passing the qualifying exam and filing a petition for candidacy.

*The following are the major milestones for the Physics Ph.D. program:*

**First year:** Pass the qualifying exam given in January of the first year.

**Second year:** Submit petition for candidacy by July 1 at the end of the second year. Candidacy is valid for five years. The Application for Candidacy is available online at <http://www.stanford.edu/dept/registrar/pdf/appcanddoct.pdf>

**Third year:** Prepare a tentative proposal for thesis research by January 1 of the third year, signed by the student, advisor and co-advisor (if required.) By this time all course requirements should be completed.

If a student wishes to start thesis research with an advisor outside Physics, Applied Physics, or SLAC, he/she must submit the following information to the Student Services Officer: Advisor's name (must be an academic council member); field of proposed research and tentative thesis title; and name of co-advisor from the Physics Department. The research plan must be approved by the Graduate Study Committee. See earlier section ("Co-advisors, Pg. 5) for more detail.

After submitting the thesis proposal, students are required to choose a reading committee in consultation with their advisors. Reading committees consist of the principal advisor and two other readers. At least one committee member must be from Physics. See earlier section ("Reading Committee, Pg.13) for more detail. These three faculty members will sign the finished dissertation. Reading committee forms are available online at <http://www.stanford.edu/dept/registrar/pdf/docrdngcomm.pdf>

**Fourth year:** Students are required to give a 45-minute oral presentation to their reading committee by June 1 at the end of the fourth year. This is meant to be an informal meeting between the student and the reading committee to obtain feedback and ideas early in the development of the thesis. The session should consist of a half-hour presentation and at least 15 minutes of discussion. Fourth year oral presentation forms are available online at [http://www.stanford.edu/dept/physics/academics/RA/Fourth\\_Yr\\_Oral.pdf](http://www.stanford.edu/dept/physics/academics/RA/Fourth_Yr_Oral.pdf)

**Fifth year:** When 135 units have been completed, apply for Terminal Graduate Registration (TGR) status. TGR forms are available in the Physics Main Office or online at:



<http://www.stanford.edu/dept/registrar/pdf/tgrreq.pdf> See earlier section ("Terminal Graduate Registration Status", Pg. 12) for more detail.

Take the university oral exam, and file dissertation by quarterly deadline.

## FINANCIAL SUPPORT

### *Financial Aid Information Forms*

The financial aid information form is sent out via e-mail every quarter and is available at <http://www.stanford.edu/dept/physics/academics/RA/PhysFinAidFormY1.pdf> for first year students and at <http://www.stanford.edu/dept/physics/academics/RA/PhysFinAidFormY2.pdf> for students in year 2 and above.

Students use this form to indicate their intention to work as a TA and/or RA, or indicate that they have fellowship support. *There is a strict deadline by which the financial aid form must be submitted to the Graduate Student Services Officer. Late submission of forms may delay stipend payment and/or cause denial of the health insurance subsidy.*

During the academic year, students can be paid for a 50% (full support) RA appointment which includes 8,9 or 10 units of tuition. Since it costs the same for 10 units as it does for 8, students are asked to register for 10 units every quarter in order to more quickly progress to TGR status and thus, a lower tuition rate. In Physics, students often combine smaller TA and RA appointments during the same quarter, for a total 50% appointment. U.S. citizens can work an additional 8 hours per week as graders. International students cannot work more than 50% during the academic year.

In summer quarter, students in year 2 can work a total 75% appointment and receive tuition allowance for 5 units, and those in years 3 and above can have 90% appointment and receive tuition allowance for three units, if the appointment is agreed to by their advisor. This is true for both U.S. citizens and international students.

### *Fellowships*

Applying for fellowships is strongly encouraged. In particular, all eligible first year students who are U.S. citizens or permanent resident aliens should apply for the NSF fellowship. See the following web sites for further information on various fellowships:

National Science Foundation (NSF): <https://www.fastlane.nsf.gov/grfp/>

Hertz Foundation: <http://www.hertzfdn.org/>

Department of Defense: <http://www.asee.org/ndseg/>

Stanford Graduate Fellowship (SGF): <http://www.stanford.edu/dept/DoR/Fellows/index.html>

(SGF is by nomination only)

NASA: <http://fellowships.hq.nasa.gov/gsrp/nav/>

See the "Web Resources" section of this handbook for more web links to fellowship information.

### *Teaching Assistantships*

Graduate students can apply for a position as a teaching assistant before the beginning of each quarter. We strongly recommend that first year students not teach in the autumn quarter while



they are settling into Stanford, finding their first research rotation, taking classes and preparing for the qualifying exam.

The salary for 2008-09 is \$4527 per quarter for 30% TA appointments, and \$3773 per quarter for 25% TA appointments, plus tuition support equivalent to that allowed for the particular appointment percentage. Head TAs, needed for the larger service courses (Physics 20 and 40 series), are paid slightly more. See Elva Carbajal, the Undergraduate Program Coordinator, for questions about teaching assistant assignments, and refer to the Physics TA handbook for general information.

The department provides a teaching orientation before students teach in the fall quarter. The Center for Teaching and Learning (CTL) has an excellent orientation session in the fall, and valuable training available at any time. All TAs will receive the CTL's useful pamphlet on teaching at Stanford. See <http://ctl.stanford.edu/> for more information.

### ***Research Assistantships***

Research assistant salaries in Physics for the 2008-2009 academic year are as follows:

50% RA	\$7335 per quarter/\$1222.50 per pay period
25% & 20% RA, 1st year students	\$3726 per quarter/\$621.00 per pay period
25% & 20% RA, 2nd year+ students	\$4222 per quarter/\$703.67 per pay period
RA Supplement (for some fellowship students)	Varies depending upon fellowship

Regular graduate (non-TGR) tuition allowances for the 2008-2009 academic year are as follows:

50% RA	\$7810 per quarter
25% RA	\$3905 per quarter
20% RA	\$3214 per quarter
RA Tuition Supplement (for some fellowship students)	Varies depending upon fellowship

The federal and state governments tax salaries for virtually all current students. Foreign students may wish to consult an advisor in Payroll or at the I-Center regarding possible tax exemption based on a treaty between the US and their home countries. See <http://www.stanford.edu/dept/icenter>. Foreign students receiving taxable scholarships or fellowships may claim any applicable treaty exemption by filing the appropriate forms with the Student Financial Services office.

### **First Year Vouchers**

#### ***What are these vouchers?***

A voucher is a 25% departmental research assistantship, providing 25% RA salary and tuition allowance for non-fellowship students. Students not on fellowship (NSF, SGF, etc.) can use up to two vouchers in the first year. Each voucher can be used to pay for the cost of a 25% RA for one quarter.

#### ***How long do I have to use them?***

You must use the vouchers in your first year as a rotation student AND they must be used during autumn, winter or spring terms. **The vouchers are not valid during summer quarter.**

***What's the purpose of these vouchers?***

The vouchers are intended to help first year graduate students without fellowship support secure a rotation with the research group that he/she is most interested in and/or help relieve the financial burden for one quarter, especially the autumn quarter.

***When should I use them?***

The vouchers are for students without fellowship support who want to work in a research group that does not have adequate funding to support them. With a voucher, you can work as a 25% RA without having the advisor pay for your stipend if you have a 25% TA appointment for that quarter. Or if you would like to work as a 50% RA, you can have the advisor pay for a 25% RA support while using one of your vouchers.

***May I use two vouchers in one quarter?***

No, you may not. Each voucher must be used in combination with either RA or TA support and must be used in different quarters, during autumn, winter or spring. **The vouchers are not valid during summer quarter.**

***Health Insurance Subsidy***

The following enrolled grad students (who do not waive Cardinal Care) will receive the FULL health insurance subsidy, currently 50% of the quarterly cost of Cardinal Care

- Those employed as a 25% or higher RA or TA.
- Those receiving at least \$2000 per quarter in fellowship stipend (non-tuition) support

Those employed as an RA or TA at less than 25%, or those who receive between \$1000 and \$2000 per quarter in fellowship stipend (non-tuition) support will be eligible for a PARTIAL benefit.

The FULL benefit for 2008/09 consists of a payment of **\$378** towards the Cardinal Care single-student health insurance premium.

The PARTIAL benefit consists of a payment of **\$189** towards the Cardinal Care single student health insurance premium.

Visit [http://cardinalcare.stanford.edu/graduate\\_faq.html](http://cardinalcare.stanford.edu/graduate_faq.html) for more detailed information about the subsidy.

***Travel Reimbursement***

The Physics Department offers matching travel fund reimbursement of up to \$300 for domestic travel, or \$500 for international travel, to assist Physics doctoral students traveling to professional meetings to present their research. Up to three trips are permitted using these funds during a student's academic career, **but only one trip per student may be funded each academic year**. Students who use this fund should be participating substantively in the meeting. Further instructions and reimbursement request forms can be found here: [http://www.stanford.edu/dept/physics/academics/Grad\\_Travel\\_08\\_09.pdf](http://www.stanford.edu/dept/physics/academics/Grad_Travel_08_09.pdf)

## ***PAYMENT OF FELLOWSHIP STIPENDS AND TA/RA SALARIES***

### ***Fellowships***

The Financial Aid Office will either directly deposit or mail checks directly to students who receive aid in the form of a University or outside fellowship at the beginning of each quarter.

### ***Salaries***

Teaching and research assistants are paid as University employees. Pay is direct deposited on the 7th and the 22nd of the month or on the preceding Friday if one of those dates falls on a weekend or holiday. The first paycheck in Autumn Quarter arrives on 10/22 for the period from 10/1 to 10/15. The 11/7 paycheck covers the period from 10/16 to 10/31. The last paycheck of the academic year comes on 7/7 for the period from 6/16 to 6/30. **Students are strongly encouraged to have paychecks deposited directly to an individual bank account. You can apply for direct deposit via AXESS. Note that students that are paid by SLAC may be subject to different rules and procedures. Check with the SLAC Human Resources Department if you have any questions.**

If you opt not to sign up for direct deposit, you can pick your check up from the main office receptionist only during regular office hours (10 a.m. - 12:00 noon and 1 p.m. - 4:30 p.m.)

All employees can view their Pay Statement online by logging in to AXESS. Holders of assistantships funded by campus (not SLAC) accounts who prefer not to pay the entire year's rent for University housing up front may sign up for Payroll Deduction. Visit the Gateway to Financial Activities for detailed information: <http://fingate.stanford.edu/students/index.html>

## ***REQUIREMENTS FOR EMPLOYMENT AS AN RA OR TA***

You will not receive a check for your work unless a number of requirements have been met. If you are not paid when you expect to be, the problem may be that you have failed to meet one of these conditions:

### **Full Time Enrollment**

*In order to receive pay from the university you must be registered as a full-time graduate student.*

This means that you must enroll in courses and/or research totaling **10** units each quarter during the academic year if not on TGR status and for the zero unit TGR course PH 802 if you are on TGR status. Enrollment levels for summer quarter will vary according to your appointment percentage.

### **Eligibility to work in US**

- All students must have a Social Security number
- All students must have an I-9 form on file at Payroll

- Foreign students must have a current visa and passport

### **English Proficiency for Teaching Assistants**

Foreign students for whom English is not the first language must be cleared by English for Foreign Students before they can TA. (See the "Requirements for the Ph.D." section of this handbook for further information.)

### **Tax declaration**

All students must have submitted a form SU-32 Employee's Tax Data (includes federal and state withholding certificate).

### **Patent Agreement Form**

If you did not complete this form via AXESS, see the Student Services Officer.

### **Automatic Payroll Deduction**

If you'd like to pay university bills via automatic payroll deduction, visit the following website: <http://fingate.stanford.edu/students/index.html/>

## ***COMMUNITY RESPONSIBILITIES***

As members of the Physics community, all students are expected to help out occasionally with special events such as our department open house, and to serve on committees.

Typical physics community responsibilities are listed below by year of study:

**First Year Students** - Assist with open house for new admits

**Second Year Students** - Assist with qualifying exam preparations

**Third Year Students** - Assist with graduate student orientation, talk to visitors

**Fourth Year and Advanced Graduate Students** - Assist with various physics community events

In addition, students may volunteer or be asked to participate in:

### ***PHYSICS GRADUATE STUDY COMMITTEE (STUDENT REPRESENTATIVES)***

Three graduate students selected by their peers attend graduate study committee meetings and give their input concerning curriculum, teaching, and department policies.

### ***TOWN HALL MEETINGS***

These meetings are held in the fall and spring quarters to discuss student related issues and concerns.

***LUNCH WITH THE CHAIR***

Each year graduate students have the opportunity to meet and have lunch with the Physics Department Chair. This is your opportunity to speak to the Chair about how things are going for you. It is also a time for you to discuss the Ph.D. Program and express any concerns or suggestions for improvement that you may have.

***COLLOQUIA***

Colloquia are held on Tuesdays in the William R. Hewlett Teaching Center, Room 201 at 4:15pm, unless otherwise indicated.

Refreshments are served at 4:00pm in the Varian Physics Lobby. The general public is cordially invited and all Physics students are encouraged to attend.

**Colloquium Speakers for Autumn 2008-2009 will include:**

Dr. Alexei Kitaev	Caltech	9/23/2008
TBD		9/30/2008
TBD		10/07/2008
Dr. Chetan Nayak	UCSB	10/14/2008
Dr. Bill Halperin	Northwestern University	10/21/2008
Dr. Peter Michelson	Stanford University	10/28/2008
Dr. Uros Seljak	Princeton University	11/04/2008
TBD		11/11/2008
Dr. Nergis Mavalvala	MIT	11/18/2008
NO COLLOQUIUM-Thanksgiving Recess		11/25/2008
TBD		12/02/2008
Dr. Paul Kushner	Univ. of Toronto	12/09/2008

Schedule may be subject to change. For up-to-date colloquium information, please check the department website: [http://www.stanford.edu/dept/physics/events/ap\\_phys.html](http://www.stanford.edu/dept/physics/events/ap_phys.html) and/or look for the notices posted weekly in the lobby of the Varian Physics building. Email notifications will also be sent out on a weekly basis when school is in session.

***BEFORE LEAVING STANFORD***

- Please return all keys to the receptionist and retrieve your deposit.
- Complete a GRADUATE EXIT INFORMATION FORM, submit it to the Student Services Officer and add your forwarding address and e-mail to AXESS.
- Apply for a leave of absence if you have not yet submitted your dissertation.
- File a "Notice of Intention to Complete Degree Requirements" for the quarter in which you expect to receive a degree. You may do this via AXESS

***RECOMMENDED REFERENCE BOOKS AVAILABLE IN THE PHYSICS LIBRARY***

The Ph.D. Process : A Student's Guide to Graduate School in the Sciences  
by Dale F. Bloom, Jonathan D. Karp, Nicholas Cohen, Oxford University Press  
(1999)

Graduate Research: A Guide for Students in the Sciences by Robert V.  
Smith, University of Washington Press (1998)

***WEB RESOURCES***

AXESS - (Requires login with SUNet ID)

<https://axess.stanford.edu/>

BULLETIN

<http://www.stanford.edu/dept/registrar/bulletin/>

STUDENT FINANCIAL SERVICES

<http://financialgateway.stanford.edu/>

CENTER FOR TEACHING AND LEARNING (CTL)

<http://ctl.stanford.edu/>

DIRECTIONS FOR PREPARING DOCTORAL DISSERTATIONS

<http://www.stanford.edu/dept/registrar/pdf/docdisdir.pdf>

HOUSING ASSIGNMENT SERVICES

<http://www.stanford.edu/dept/rde/has/>

COMMUNITY HOUSING SERVICES

<http://www.stanford.edu/dept/hds/chs/index.shtml>

BECHTEL INTERNATIONAL CENTER

<http://www.stanford.edu/dept/center/index.html>

ENVIRONMENTAL HEALTH AND SAFETY

<http://www.stanford.edu/dept/EHS/prod/> AND

<http://www.stanford.edu/dept/physics/facilities/safety/>

LIBRARIES - <http://www-sul.stanford.edu/>

MAPS

<http://www-facilities.stanford.edu/maps/download.html>

PHYSICS

<http://www.stanford.edu/dept/physics>

REGISTRAR'S OFFICE

<http://www.stanford.edu/dept/registrar/>

STANFORD LINEAR ACCELERATOR CENTER (SLAC)

<http://www.slac.stanford.edu/>

STANFORDWHO

<https://stanfordwho.stanford.edu/lookup>

STANFORDYOU - (Requires login with SUNet ID)

<https://stanfordyou.stanford.edu/main/home>

STANFORD UNIVERSITY GRADUATE STUDENT HANDBOOK

<http://www.stanford.edu/dept/DoR/GSH/>

## ***FELLOWSHIPS & SCHOLARSHIPS***

AT&T

<http://www.research.att.com/academic/alfp.html>

HERTZ FOUNDATION

<http://www.hertzfndn.org/>

IBM

<http://www.developer.ibm.com/university/scholars/fellowship/phd/>

NASA GRADUATE STUDENT RESEARCHERS PROGRAM (NASA GSRP)

<http://fellowships.hq.nasa.gov/gsrp/>

NATIONAL DEFENSE SCIENCE & ENGINEERING GRADUATE FELLOWSHIP (NDSEG)

<http://www.asee.org/ndseg/>

NATIONAL PHYSICAL SCIENCE CONSORTIUM (NPSC)

<http://www.npsc.org/students/info.html>

NATIONAL SCIENCE FOUNDATION (NSF)

<https://www.fastlane.nsf.gov/grfp/>

STANFORD GRADUATE FELLOWSHIP (SGF) *BY NOMINATION ONLY*

<http://www.stanford.edu/dept/DoR/Fellows/>

**PHYSICS DEPARTMENT DIRECTORY**

Prefix for all numbers is 72 unless otherwise noted

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**PHYSICS DEPARTMENT DIRECTORY**

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**PHYSICS DEPARTMENT DIRECTORY**

Prefix for all numbers is 72 unless otherwise noted

	<i>PHONE</i>	<i>E-MAIL ACCT</i>	<i>LOCATION</i>
<b><u>Facilities</u></b>			
Lunch Room	736-0805		Varian 109
2nd Floor Conf. Room	3-0870		Varian 208
3rd Floor Conf. Room	4-6747		Varian 355
Lab, Advanced	5-2374		Varian 406
Physics Lab	736-7230	*PAP Sub-basement	S08,S12,S16,S17
Observatory	322-3579	92 Alta Road	12-070
Library, Stella Ota	3-9763, 3-4342	<a href="mailto:skota@stanford.edu">skota@stanford.edu</a>	Varian 300
Library, Larry Lim	3-4342	<a href="mailto:lmlim@stanford.edu">lmlim@stanford.edu</a>	Varian 300
Library	3-4343		Varian 300
Library	3-4342	<a href="mailto:physicslibrary@stanford.edu">physicslibrary@stanford.edu</a>	Varian 300
Machine Shop	3-2679, 5-2327		Varian 001
Hewlett Mgr, Marc Blackwood	804-2073	<a href="mailto:marc.blackwood@stanford.edu">marc.blackwood@stanford.edu</a>	Hewlett 111D
Health & Safety Hot Line	723-8410		
Classroom Technician	3-7280	<a href="mailto:daward@stanford.edu">daward@stanford.edu</a>	Registrar - ITTech
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Wong, Heidi	5-0497	<a href="mailto:heidyyw@stanford.edu">heidyyw@stanford.edu</a>	*P-AP 111
Physics Hot Line	5-0961	SUPDS 3-9633	

\*P-AP = Physics-Astrophysics Building



