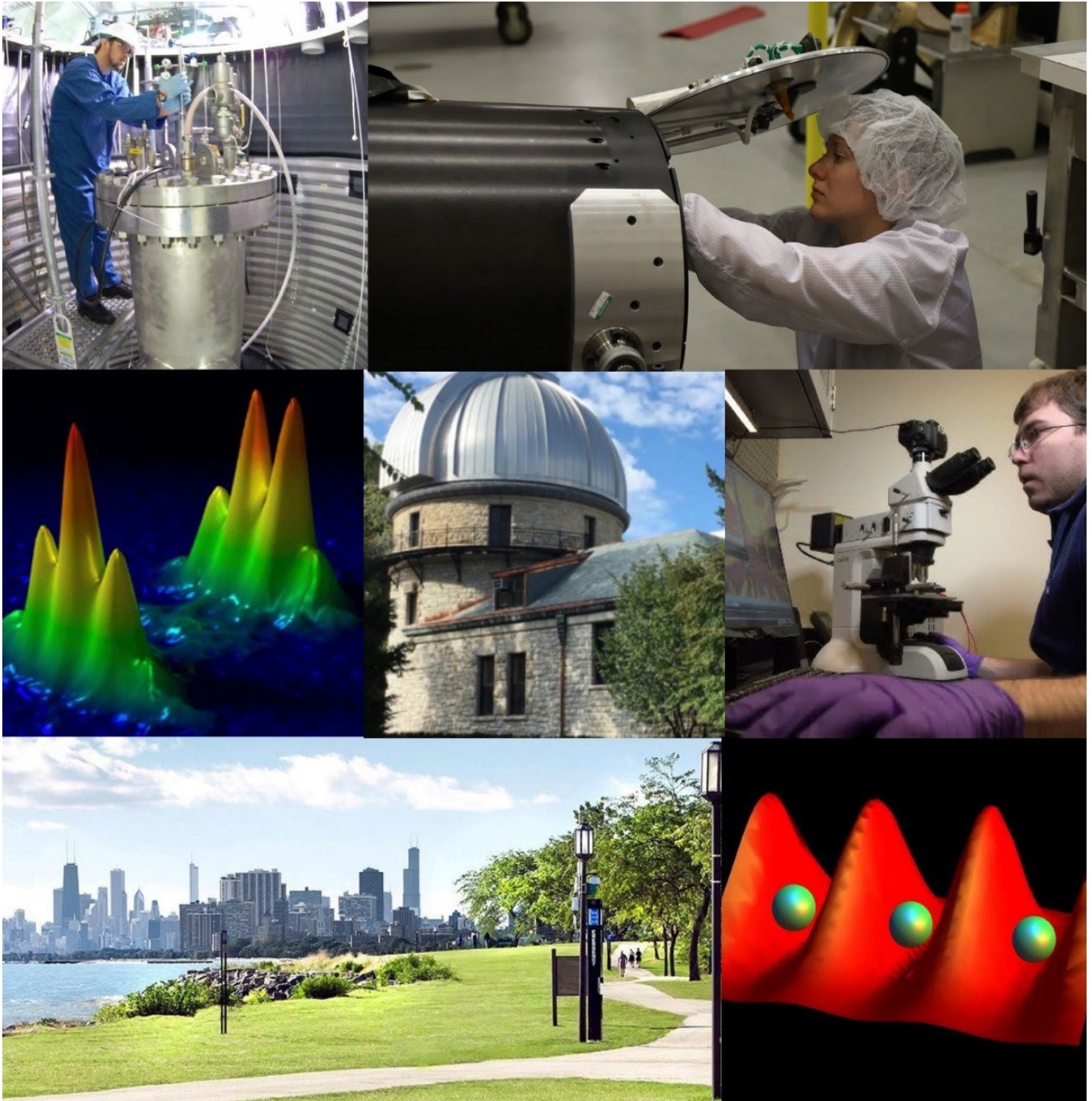


PhD in Physics & Astronomy



Northwestern University
Department of Physics & Astronomy
PhD Program Handbook
Academic Year 2021-2022



Welcome to the Department of Physics and Astronomy

We are delighted to have you join us here in the Department of Physics and Astronomy, and we are looking forward to seeing you mature and grow as a scientist. We expect you to work hard, to master fundamental topics, to learn key research skills, to help your classmates improve in their own research and to make the Department a place of high-quality scientific activity. We wish you all the best for your time here and are ready to help you in any way possible.

The Department, like all of the world, is dealing with COVID-19. We carefully and mindfully follow the guidelines from Northwestern Administration to keep all members of the department safe. Please do your part by following the guidelines and bringing your concerns to our attention. Learning and research are important, but people's safety is more important.

We strive to maintain an inclusive atmosphere in the Department of Physics & Astronomy that is welcoming to all. We expect that all members of our department will uphold these principles in their interactions with each other. The departmental website has additional information about our equity and inclusion initiatives, as well as resources for students seeking help or guidance.

This document should answer most questions that you will have throughout your time here.

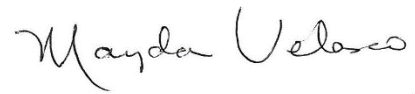
Sincerely,



Professor Michael Schmitt
Chair, Professor
Department of Physics and Astronomy
Northwestern University



Professor Lithwick Yoram
Director of Graduate Studies for Astronomy
Department of Physics and Astronomy
Northwestern University



Professor Mayda Velasco
Director of Graduate Studies for Physics
Department of Physics and Astronomy
Northwestern University

Program Overview

The goal of the Northwestern Physics PhD Program and the Astronomy PhD program is to provide opportunity, education, and mentoring to develop each PhD student into a productive scientist. This training has two general phases: education and scientific activity.

The first phase of the PhD is characterized by an emphasis on classroom education. In graduate classes, students learn physics fundamentals and develop more specialized knowledge. In fulfilling teaching duties, PhD students learn communication skills and how to effectively teach science. In the early stages of working with a research group, PhD students learn fundamentals of their chosen area.

The second phase of PhD training is characterized by an emphasis on scientific activity. During this phase, students become increasingly effective at working with their research groups to push knowledge forward in their area of study, at communicating their results to a broad audience through publications and oral presentations, and at becoming leaders of scientific thought within their area of expertise.

Officially, the transition from the education phase to the scientific activity phase is marking by passing of the Prospectus (also known as the Candidacy Exam). In practice, the transition is gradual, with a timeline depending largely upon the student's level of undergraduate preparation and area of research. Some students contribute important work to their research groups as early as the summer before their first year, and others begin their period of scientific productivity as late as the summer after their second year. All students are expected to have begun working with a research advisor by the summer of their first year.

The Physics Graduate Handbook supplements The Graduate School’s (TGS) policies and procedures. The following pages contain information about program-specific policies, procedures, and regulations. Students are subject to the regulations in effect at the time of matriculation. It is their responsibility as students to be aware of these and The Graduate School’s regulations.

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PhD Timeline

Year One	Typical Funding	Registration	Milestones to be Achieved	Forms to be Completed
Q1 - Fall	University Fellowship	3-4 units of coursework	All core courses completed by end of Q3.	
Q2 - Winter		3-4 units of coursework	Some elective courses completed.	
Q3 - Spring		3-4 units of coursework	Q4: Core course grade check. If core GPA < 3.0, pass oral exam on physics fundamentals.	
Q4 - Summer		3 units of Physics 590 or Astro 590	Physics 519- Responsible Conduct of Research	
Year Two	Typical Funding	Registration	Milestones to be Achieved	Forms to be Completed
Q5 - Fall	Q5-7: TA	3-4 units of coursework	Eleven courses must be completed by end of Q7.	
Q6 - Winter		3-4 units of coursework		
Q7 - Spring		3-4 units of coursework		
Q8 - Summer	Q8: RA	3 units of Physics 590 or Astro 590		
Year Three	Typical Funding	Registration	Milestones to be Achieved	Forms to be Completed
Q9 - Fall	RA	TGS 500 and/or coursework	Candidacy Exam passed by end of Q12. Prospectus typically completed prior to Candidacy Exam and approved during Exam.	If completed, PhD Prospectus form (submitted by student via TGS Forms in GSTS)
Q10 - Winter		TGS 500 and/or coursework		
Q11 - Spring		TGS 500 and/or coursework		
Q12 - Summer		TGS 500 and/or coursework		
Year Four	Typical Funding	Registration	Milestones to be Achieved	Forms to be Completed
Q13 - Fall	RA	TGS 500 in addition to non-required coursework	Prospectus	PhD Prospectus form (submitted by student)
Q14 - Winter				

Q15 - Spring				via TGS Forms in GSTS
Q16 - Summer				
Year Five and Onward	Typical Funding	Registration	Milestones to be Achieved	Forms to be Completed
Q17 - Fall	RA	TGS 500 in addition to non-required coursework	Degree deadline - students have 9 years from matriculation to complete the PhD degree. Only rarely under extenuating circumstances will students be granted permission to continue beyond 9 years.	Students who are completing their degree must complete: (1) Application for Degree via TGS Forms in GSTS ; (2) Final Exam Form via TGS Forms in GSTS to be approved by the program (3) Online submission of dissertation via UMI ProQuest
Q18 - Winter				
Q19 - Spring				
Q20 - Summer				

*Students who do not complete degree requirements within nine years of initial registration in a doctoral program will not be considered in good academic standing, will be placed on probation, and will be subject to TGS 513 (advanced continuous registration).

Calendars

The most up-to-date Northwestern academic calendar can be found [here](#).

The Graduate School has a calendar [here](#) as well.

The holiday schedule can be found [here](#).

[Plan It Purple](#) is Northwestern's calendar for all things educational, social and fun.

Pandemic-related Changes for 2021-2022

Wildcat Wellness

Students are expected to follow all Northwestern guidance related to Wildcat Wellness: (<https://www.northwestern.edu/coronavirus-covid-19-updates/health/wildcat-wellness/index.html>).

Current Policy on Remote Learning

Previously, in the Fall 2020, Winter 2021, and Spring 2021 quarters, courses were mostly held remotely over Zoom to stem the spread of corona virus. Northwestern University has moved back to in-person instruction, with no courses being offered remotely. Similarly, all Qualifying Exams, Dissertation Proposals (known commonly as "Prospectus"), and Dissertation defenses will be conducted in-person.

Advising

Identifying an Advisor

Selecting a research advisor is one of the most important choices a PhD student makes. Students should work with an advisor over the summer following their first year, and most students actually begin working with an advisor before that time. Research advisors provide financial support in the form of Research Assistantships beginning in the Summer Quarter of the second year.

Changing Advisors

Most students remain with a single advisor for their entire PhD study, but it is not uncommon for students to change advisors, particularly in their first or second year. A faculty member is not obliged to keep a student in his/her group; rather, continued group membership is a matter of mutual agreement. Should a student need to change advisors, they should consult the DGS.

Consequences of Not Having an Advisor

Students who have not found an advisor by Q7 risk losing financial support and exclusion from the program. The department is committed to providing year-round financial support to all graduate students who are in good academic standing and are making satisfactory progress toward the PhD degree supervised by a faculty member in the department.

Failure to find an advisor's support by the beginning of the third year may constitute failure to make satisfactory progress and may lead to dismissal from the program.

Candidacy/Prospectus Committee

The committee is selected at the time the Candidacy Exam is scheduled. The committee must be composed of at least three faculty members including the candidate's advisor, with at least one of the members having a budgetary appointment in the Department of Physics and Astronomy. Many groups prefer to have a committee of four or even sometimes five members. Diverse committee composition is encouraged, ideally with one or more members specializing in general areas of research different from that of the candidate.

Dissertation Committee

Students identify their dissertation committees with the help of their advisor. The dissertation committee is typically the same committee as the Candidacy/Prospectus committee, and the guidelines for membership are the same as for the prospectus committee. The names of the committee members must be added to the relevant documents in [GSTS](#). This information helps the Department know whom to contact when it comes time for the prospectus and dissertation defense.

Any change in committee members must be approved by the advisor.

Courses: Physics PhD Program

There are 7 required Core courses and 6 required Elective courses. Students must obtain a grade of C- or higher in each course for it to count toward their PhD. There is also an overall GPA requirement discussed [here](#). It is strongly recommended that students discuss course choices with their advisor or the DGS.

Core Courses

The Core course requirements for the PhD program are as follows:

- One quarter of classical mechanics (Physics 411-0)
- Three quarters of quantum mechanics (Physics 412-1,2,3)
- Two quarters of classical electrodynamics (Physics 414-1,2)
- One quarter of statistical mechanics (Physics 416-0)

Students should contact the DGS if they believe they should be excused from any of the core requirements.

Electives

Students must complete six (6) elective courses. Four of these six electives must be completed by the end of the 7th quarter (Spring of the second year). Descriptions of these courses can be found [here](#). Courses outside the department may be allowed to fill the Elective requirements. The DGS should be consulted before registering for courses outside the department.

Courses: Astronomy PhD Program

Core Courses

A minimum of six (6) 400-level astronomy courses must be selected from the following:

Astro 314/414

Astro 321/421

Astro 325/425

Astro 329/429

Astro 410

Astro 416

Astro 448

Physics Courses

A minimum of two (2) 400-level physics courses must be taken. All students must take Phys 411-0: Classical Mechanics during their first quarter at Northwestern, which ensures that Astronomy PhD students are well integrated with Physics PhD students when they start at Northwestern.

Students should contact the DGS if they believe they should be excused from any of the core requirements.

Electives

A minimum of four other 400-level quantitative science or engineering courses must be taken (including in physics or astronomy).

Other Courses

Physics 519- Responsible Conduct of Research (required)

This course is required, although it does not count toward the Core Course requirement for the degree. It is a two-part course, with an online component followed by four hours of instructor-led training. The Department typically holds this course in the Winter quarter. For more information about the course, please go here:

<https://www.weinberg.northwestern.edu/staff/research-administration/compliance/responsible-conduct-of-research-rer.html>

Physics or Astronomy 590

This P/NP research course allows junior students to maintain full-time status in order to do research. This course is generally used in the first seven quarters of the PhD. It should also be taken by more senior students who have not yet completed nine Northwestern courses toward their degree. Students should register for enough units of this course to bring their number of courses up to three.

TGS 500

This P/NP research course is for senior students who are supported by an RA, TA/GA or Fellowships. Supported students who are past their eighth quarter and who have completed more than nine courses toward their degree register for this course to maintain full-time status. This course carries zero units course credit.

Physics or Astronomy 499

This course allows students to work on a specific topic not covered by any lecture courses under the guidance of a faculty member of the Department of Physics and Astronomy. The student receives a letter grade (not P/NP) based on an evaluation conducted by the faculty member. This course carries the same credit as a lecture course. At most, half of the courses taken by a first-year student can be 499. This course is only rarely used by students in this department.

TGS 512

This option allows students to maintain full-time status in the event that they lose funding. It can also be used by advanced students who need to temporarily step away from any research or teaching responsibilities. Students registered for this course can continue to use university facilities. When registered for TGS 512 students are able to purchase the Northwestern Student Health Insurance plan, but are not eligible to receive the health insurance subsidy. Students taking this course cannot be registered for any other TGS course and cannot receive a stipend.

Core Course Competency

Physics PhD: The six core courses must be completed by the end of Q3. Students receiving a GPA less than a 3.0 in their core courses will be required to take a special oral exam. This exam will emphasize subjects where the student obtained weak grades and will assess whether the student has sufficient grasp of core physics knowledge to complete a strong Ph.D. The exam will be administered near the end of Q4 by a committee chosen by the Director of Graduate Studies and the Department Chair. The committee reports the student's performance to the Department faculty early in Q5, and the faculty together determine whether the student passed the exam. Students failing the exam will be deemed to be in poor academic standing and will leave the program at the end of Q5.

Astronomy PhD: Students may take up to 2 years to finish their course requirements. Students who do not maintain a B (3.0) average in their core first-year courses will be required to sit for an oral qualifying examination administered by the faculty who teach first-year courses.

Teaching Requirements

Students typically serve as Teaching Assistants (TA) for three quarters (Fall, Winter and Spring) in their second year. In most cases, TAing provides the source of funding during such quarters. It also provides a chance to work with undergraduate students and helps build speaking and teaching skills. TGS requires all PhD students to teach for at least one quarter before graduating.

The TA position has an English-language requirement for students whose native language is not English. If a student is an international student and has not received a degree from an English-speaking institution, he/she must pass either the VERSANT test or the SPEAK test to be eligible for a Teaching Assistantship. Please see the [International Students](#) section below.

More information on [Teaching Assistantships](#) from TGS.

Candidacy Exam and Prospectus

The Candidacy Exam consists of an oral presentation by the student demonstrating mastery of concepts in his/her research field. The presentation is often organized around any research progress to date. The Candidacy Exam is administered by the student's Candidacy/Prospectus committee and must be passed by the end of the 3rd year. If the Candidacy Exam is not completed by this point, TGS will place the student on Academic Probation.

The Prospectus is a written proposal describing the student's proposed PhD research. The Prospectus length varies from one paragraph to several pages, depending on requirements of the student's research group. The Prospectus must be completed and approved by the end of the 4th year. If the Prospectus is not completed by this point, TGS will place the student on Academic Probation.

Candidacy Exam Room Booking and Reporting

Please come to the Academic Office to book a room for the Candidacy Exam. The Graduate Program Assistant will ensure that the paperwork has been submitted successfully.

Prospectus Reporting

Students must access GSTS (<https://gsts.northwestern.edu>) and enter in the information for the PhD Prospectus form. (Main Menu > TGS Forms > Create New Form > PhD Prospectus)

Degree Completion and Graduation

TGS requires that PhD students complete all degree requirements before the end of the 9th year of study. If a student's studies are interrupted, the PhD clock is paused accordingly.

Writing the Dissertation

The dissertation is an original, scientific document ranging in length. It may not be simply a summary of what others have done but rather must center on truly original scientific results. In most cases, the results have been or will be submitted for publication in a scientific journal.

Dissertation Defense

The defense presents the culminating opportunity for a candidate to present his/her work to his/her committee and to persuade the committee that a PhD has been earned. It is also the final opportunity for the committee to test the candidate's grasp of fundamentals and of his/her ability to defend the quality of the work.

Astronomy thesis defenses include a closed-door session in which the committee examines aspects of the work in rigorous detail. Beyond the inclusion of a closed-door session of some duration, formats vary from group to group, with

some groups having a public component and other groups having none.

Defense Deadlines

In order to provide sufficient time for thesis revision after the thesis defense, the defense date must be chosen to be at least 7 days in advance of any [TGS deadline](#), job start date deadline, etc.

Students should contact their committee well in advance of the desired defense date in order to agree upon a specific date and arrange a schedule for submission of thesis material. Aligning schedules can sometimes be difficult, so it is recommended that the schedule be set at least three months in advance.

Paperwork

First, log on to [GSTS](#) and fill out the Application for a Degree form.

(Main Menu > TGS Forms > Navigate to Application for a Degree Form)

Then, fill out the PhD Final Exam Form, also in [GSTS](#). (Main Menu > TGS Forms > TGS PhD Final Exam Form) The PA prints out a copy of this once it is completed and attaches it to the folder that the Advisor picks up on the day of the Defense. This form must be signed by all Committee members. The Advisor then returns it to the PA who enters the information into the system.

Submitting the Thesis Draft

A complete copy of the thesis must be submitted to the committee no less than 7 days before the scheduled defense date (and therefore at least 14 days before TGS or other external deadlines). At the time the schedule is originally established, committee members can notify the candidate that they will require more than 7 days, for example in order to accommodate travel constraints or particularly intensive review styles.

The submitted draft must be a polished and complete version that could credibly stand as a final thesis as submitted.

Booking a Room

Please contact the Academic Office (F165) in order to book a room.

Successful Defense and Editing

Assuming the Defense is successful, the student must finish all the edits requested by the committee. The advisor must approve the final version of the thesis before the Graduate Program Assistant enters in the completion of the degree. The student will receive an email from TGS stating that the degree form has been approved.

Submission of the Dissertation to ProQuest

The student must complete all required editing before the final submission of the Final Exam Form takes place. It is advised that all editing is completed as quickly as possible.

Once the editing is complete and the Advisor has approved the thesis, the student submits his/her Dissertation via the [ProQuest website](#). The Dissertation must conform to TGS formatting standards found [here](#). Formatting is reviewed by a Student Services representative who will inform the student if it is acceptable or if changes are needed.

Grade Changes

Any Y or K grades must be changed before a degree may be conferred.

Graduation

Hoarding and Commencement take place once a year in mid-June. Students are invited to the ceremonies in June, without regard to the quarter of completion, as there are no other ceremonies throughout the year.

Usually, the advisor will do the hooding. However, another faculty member may be asked.

Obtaining a Master's Degree

Students who have completed all of the necessary courses with a cumulative GPA of at least 3.0 may request to receive a Master's degree. Most students who choose to leave the PhD program execute this option. Some students remaining in the PhD program also execute this option.

Satisfactory Academic Progress

GPA Requirement

The Department follows The Graduate School's minimum GPA requirement of a 3.0. The Department follows The Graduate School's minimum GPA requirement of a 3.0 for a student to be considered to be in good academic standing. There is also a grade requirement on each individual course for it to count for the PhD [here](#).

Academic Probation

Should a student's GPA fall below 3.0, he/she will be placed on Academic Probation and given two quarters to raise his/her GPA above the minimum. Students who are placed on probation by TGS (<http://www.tgs.northwestern.edu/about/policies/satisfactory-academic-progress.html>) and who are unable to attain remediation during the probationary period will be dismissed from the program.

Failure to find a Research Group by the end of the 7th quarter is also grounds for being placed on Academic Probation.

Extending Academic Probation

The TGS policy regarding petitions for extensions of Academic Probation is straightforward. The student must submit a [petition](#). The following criteria must be met:

- The specific length of the extension including the exact date by which the requirement will be met: the extension time frame should be realistic.
- A detailed rationale for the extension
- A detailed timeline for meeting the new deadline including what work remains to be completed and the specific timeline, with proposed deadlines by which that work will be completed within the extension period
- A detailed letter of support for the extension from the Director of Graduate Study
- A detailed letter of support for the extension from the student's academic/research advisor

Academic Progress Reports

Each student's academic progress must be reported annually by the student's program to the student and to TGS. Each quarter, grades will be checked for substandard performance. Students must ensure that they are maintaining their grades and finishing their work in a timely manner. If they are having trouble doing so, they must work with their advisor and the DGS to resolve issues preventing inadequate performance.

Students can find their Academic Progress Reports in [GSTS](#). This is also where students are expected to tell the Department about their progress. Advisors also report on progress in GSTS and students can find his/her thoughts there. It is vital that students report this, as this gives a good idea of where they are and how they will get to the next step.

Dismissal Process

The DGS and the Chair have the responsibility to decide whether a student is to be dismissed. Their decision is final.

Leaves of Absence

Leaves of absence must be approved by your advisor, the DGS and TGS. Leaves of absence are permitted in the following circumstances.

- [Medical Leave of Absence](#): For students who must temporarily interrupt progress toward degree due to a physical or mental health condition.
- [Family Leave of Absence](#): For students who must temporarily interrupt progress toward degree to care for a child or other family member, or to extend absence following a parental accommodation. This is separate from and may be taken in addition to a [parental accommodation](#).
- [Parental Accommodation Leave](#): For students who become new parents (whether by childbirth or adoption).
- [General Leave of Absence](#): For students who elect to temporarily interrupt their progress toward degree for a non-medical/non-family care reason.

Please see TGS' [Leaves of Absence](#) policy page for further details and requirements.

Submitting a Leave of Absence Request

Family, Parental and General leave of absence requests are submitted via [GSTS](#). GSTS > TGS Forms > Petition for Absence

The process for a student to request a medical leave of absence is outlined on the [Dean of Students, Medical Leave of Absence website](#).

Funding

First Year

In the first Fall, Winter, Spring and Summer quarters, students are typically supported by a University Fellowship (UF) provided by the Department. This fellowship is detailed in the Department's offer letter. Fellows receive a monthly stipend, health insurance, and a full tuition scholarship. Fellows are not normally assigned any departmental duties; however, it is expected that University Fellows will take advantage of the time provided by the fellowship to become involved in research and to attend seminars, colloquia and other departmental activities.

Second Year

During Fall, Winter and Spring quarters of their second year, students are usually supported as Graduate/Teaching Assistants during the academic year. Graduate/Teaching Assistants normally spend 10-15 hours per week teaching undergraduate laboratories, leading discussion sections, grading, and tutoring. A small number of summer Graduate/Teaching Assistant positions is also available.

Every quarter, the Director of Operations issues a call for students who need or would like to serve as Teaching Assistants. Students should respond promptly to this call (if they want a position) after consulting with their advisor. While second-year students have priority for Teaching Assistant positions, it is common for students past their second year to serve as Teaching Assistants.

Second Summer and Onward

From the second summer on, students are supported through one of the following: a Research Assistantship or a Graduate/Teaching Assistant position.

Fellows, RAs and GA/TAs vary, depending on the student's admissions offer and research group. If a student is granted financial support, he/she is immediately sent a letter specifying the precise details and amount of the award. There is a minimum stipend offered through TGS. The business office is the best place to check on this stipend.

Payday

Payday is the last working day of every month. [Information on Direct Deposit.](#)

Health Insurance

All Northwestern students are required to maintain health insurance coverage. PhD students in the Physics program are eligible for a 100% subsidy of the health insurance cost if they enroll in the Northwestern student health insurance plan (NU-SHIP). Students will still be responsible for any copayments or deductibles. The Graduate School will apply the subsidy once students are registered fulltime (other than TGS 512 – Continuous Registration). The credit will appear on the student's account. [Information on the Health Insurance Plan.](#)

Student Activity Fee

This fee covers special services, including discounted CTA rides, gym membership and programs for students, among other things. It is required for all full-time enrolled Graduate School students, except for those enrolled in TGS 512, 513, 514, 506, 507 or 508.

More information about the [Fee.](#)

Students who are off-campus for research or studies may submit a [waiver form.](#)

Taxes (Domestic Students)

Students on fellowships should report the fellowship stipend to the IRS after the students make deductions for books/supplies (save receipts) and required fees.

The University will not withhold Federal or Illinois taxes from the fellowship stipend unless a request to the Payroll Office to withhold a specific dollar amount each month is made (i.e. \$25/month) on the appropriate W-4 form and will not withhold taxes on the fellowship even if the student has filed the Federal or Illinois W-4 forms claiming any exemptions.

Teaching, Graduate Assistants and Research Assistants will need to complete W-4 Federal and Illinois withholding forms because the University is required to withhold taxes from stipend checks.

The IRS treats assistantships differently than fellowships--students are not permitted to deduct books/supplies and required fees from the amount that is reported to the IRS. The student's entire earnings as a teaching/graduate assistant or research assistant will be reported to the IRS.

If a student registers for classes past the deadline given by TGS, Social Security contributions may be taken out. Please make sure registration is complete. The Graduate Program Assistant will send emails to ensure registration occurs.

TGS' [Information on Taxes](#) is a very helpful site.

Conference Travel Grants

There are several sources of funding available. TGS provides Conference Travel Grants with a maximum value of \$600.

Students are eligible for two (2) grants total over the course of the program. They may only apply after they have completed three (3) quarters of the program. Applications must be submitted no later than 30 days prior to the beginning of travel.

To apply for the grants and to check additional rules on eligibility, please go to this [TGS webpage](#).

If travel expenses surpass the above-listed amount, the remainder is paid for with research funds or advisors' discretionary funds. Consult the advisor's financial assistant or research administrator to check whether or not funding is available.

Before traveling, please consult the person in charge of finances for the Advisor's group. He/she will be able to provide more options for pre-paying flights or conference registrations.

Questions about Finances

Tuition, Stipends, Fees

Any questions about tuition, stipends and fees are handled by the Financial Assistant (F151) or the Research Administrator (F151).

Expense Reports

The Faculty Program Assistant for each research group assists with expense reports for travel expenses, materials, and other expenses incurred. Please place completed reports in the file holder hanging on the cubicle wall of the Graduate Program Assistant's desk in the Academic Office.

Supplies

Lab supplies are ordered by the Accounting Specialist (F155).

Office supplies are found in the Academic Office (F165).

Additional Funding Opportunities

More information about all types of fellowships and grants can be found [here](#).

International Students

The Department has many students hailing from countries all over the world. The [International Office](#) is available by appointment for advising services and support programs. The Graduate Program Assistant is also available to offer support.

Course Requirements During COVID Pandemic (Updated Policy Fall 2021)

Northwestern University has transitioned back to fulltime in-person instruction. As such, no courses may be taken remotely at this time. The university continues to monitor the situation and will adapt accordingly.

Visa Regulations

International students who are not permanent residents are given an F-1 or J-1 Student Visa. This visa gives the right to study here in the United States but does not confer working rights, so students may not hold a job aside from the appointment as a PhD student.

The University helps apply for the visa and sends the Form I-20 papers. Bring the Form I-20 papers upon arrival in the

United States. Students may arrive up to 30 days before the start date listed on the Form I-20.

English-language Skills

International students are expected to have taken the TOEFL test or a suitable alternative. If the score on the speaking portion of the TOEFL was lower than a 26, students must take the VERSANT speaking test in order to be cleared to be a Teaching Assistant. Should a student fail that test, he/she is asked to take a different test called the SPEAK test.

Students may also enroll in [English Language Programs](#). Please email elp@northwestern.edu for more information.

Course Registration

Foreign students on an F-1/J-1 visa must be registered for a minimum of three credits.

Foreign students who are not registered for other courses are required to register for TGS 512 in order to maintain their F1/J-1 status, usually during the summer or during any leave taken. A minimum cumulative GPA of 3.0 is required to qualify for TGS 512.

Fellowships for International Students

Information on fellowships for International Students can be found [here](#).

Taxes

<http://www.northwestern.edu/international/living-working/taxes-and-legal-matters/taxes/index.html>

International Office

<http://www.northwestern.edu/international/>

Department Staff Members

Director of Graduate Studies

Director of Graduate Studies

Academic Office (F165)

Department Chair

Director of Operations and Outreach/Assistant Chair

Faculty Program Assistants

Graduate Program Assistant- your main point of contact

Business Office (F155)

Business Administrator

Research Administrator Accounting

Specialist

Financial Assistant

Please check the Department [website](#) for the most current staff members.

Any questions about the Department can be directed to the Graduate Program Assistant.

Department Activities

Students are expected to attend all colloquia, all seminars in their research area, and all Brown Bag Lunches. These events serve to broaden students' knowledge in a range of fields, demonstrate effective scientific communication, and aid in networking within and outside the department.

Every week, a bulletin will be posted and sent to the graduate email list that says when and where each event takes place.

Colloquia

On Friday, an invited speaker of renown gives an hour-long colloquium usually at 4pm in L211. After the presentation and the question-and-answer session, snacks and refreshments are served in F160.

Brown Bag Lunches

The Brown Bag Seminar is a bi-weekly seminar series held on Wednesdays during the lunch hour (12:00PM-1:00PM) with pizza available on a first-come-first-served basis. The seminars feature two speakers from the department, each giving talks that last 20-25 minutes with 5-10 minutes available for questions. The speakers are drawn from a combination of professors, post-docs, and graduate students and the level of the talks is aimed at a first-year graduate student.

Seminars

Regular and special seminars are offered in various sub-fields of physics and astronomy. These are announced each week in the departmental email bulletin.

Heilborn Lectures

The department of Physics and Astronomy is grateful to George Heilborn (1935-2015), a graduate of Northwestern's physics program, and his family, for their generous support of the Heilborn Lectures at Northwestern University. We have benefited greatly from this program over the years. George Heilborn created the Heilborn endowment in memory of his parents, Walter and Christine Heilborn, in 2000 in order to strengthen the Physics and Astronomy program at Northwestern for the benefit of faculty, students, and other departments in the Chicago area.

There are several talks, lectures and chances to meet the speaker. Past speakers include Nobel Laureates, Professors, Physicists and Astronomers from the top laboratories in the world.

Link: [Past Heilborn Lectures](#)

Graduate Student Council

Mission

The goal of the Physics & Astronomy Graduate Student Council (PAGSC) is to address important issues pertaining to Physics & Astronomy graduate students at Northwestern University. The Council provides a structure to organize student efforts, to receive input from the student body, and to work with the Physics & Astronomy department.

Activities

The main activity organized by the Council is the weekly Grad Student Coffee Hour (Mondays at 12:00PM in F160). Other activities include quarterly town-hall meetings, barbecues, game nights, pizza nights and other ad hoc get-togethers.

Please contact the President of the Council for more information: PAGSC_President@u.northwestern

Nondiscrimination Statement, Conflict Resolution, and Counseling

The Department and TGS are committed to maintaining an environment that fosters student education and training and have established the following guidelines for dealing with any type of conflict that might arise.

Nondiscrimination Statement

Northwestern University does not discriminate or permit discrimination by any member of its community against any individual on the basis of race, color, religion, national origin, sex, pregnancy, sexual orientation, gender identity, gender expression, parental status, marital status, age, disability, citizenship status, veteran status, genetic information, reproductive health decision making, or any other classification protected by law in matters of admissions, employment, housing, or services or in the educational programs or activities it operates. Harassment, whether verbal, physical, or visual, that is based on any of these characteristics is a form of discrimination. Further prohibited by law is discrimination against any employee and/or job applicant who chooses to inquire about, discuss, or disclose their own compensation or the compensation of another employee or applicant.

Northwestern University complies with federal and state laws that prohibit discrimination based on the protected categories listed above, including Title IX of the Education Amendments of 1972. Title IX requires educational institutions, such as Northwestern, to prohibit discrimination based on sex (including sexual harassment) in the University's educational programs and activities, including in matters of employment and admissions. In addition, Northwestern provides reasonable accommodations to qualified applicants, students, and employees with disabilities and to individuals who are pregnant.

Any alleged violations of this policy or questions with respect to nondiscrimination or reasonable accommodations should be directed to Northwestern's Office of Equity, 1800 Sherman Avenue, Suite 4-500, Evanston, Illinois 60208, 847-467-6165, equity@northwestern.edu.

Questions specific to sex discrimination (including sexual misconduct and sexual harassment) should be directed to Northwestern's Title IX Coordinator in the Office of Equity, 1800 Sherman Avenue, Suite 4-500, Evanston, Illinois 60208, 847-467-6165, TitleIXCoordinator@northwestern.edu.

A person may also file a complaint with the Department of Education's Office for Civil Rights regarding an alleged violation of Title IX by visiting <https://www2.ed.gov/about/offices/list/ocr/complaintintro.html> or calling 800-421-3481. Inquiries about the application of Title IX to Northwestern may be referred to Northwestern's Title IX Coordinator, the United States Department of Education's Assistant Secretary for Civil Rights, or both.

Conflicts Involving Discrimination and Harassment

Harassment, whether verbal, physical, or visual, that is based on race, color, religion, national origin, sex, sexual orientation, gender identity, gender expression, parental status, marital status, age, disability, citizenship, or veteran status is a form of discrimination. Discrimination and harassment complaints should be referred to the Office of Equal Opportunity and Access. Information regarding Sexual Harassment is found below.

Office of Equal Opportunity and Access: <http://www.northwestern.edu/hr/eoo/>

Sexual Harassment

It is the policy of Northwestern University that no member of the Northwestern community- students, faculty, administrators, staff, vendors, contractors, or third parties - may sexually harass any other member of the community. For information or assistance regarding a sexual harassment complaint, please visit the [University's Sexual Harassment Prevention Office](#).

Conflicts Not Involving Discrimination, Harassment, or Sexual Harassment

When a conflict arises, whether with a student's advisor, a fellow student, or someone else in the University, TGS recommends that students first talk to their DGS. One function of the DGS is to address student concerns and grievances and to be available when students are experiencing academic difficulty. If a student is unsure who his or her DGS is, please contact the department office (847-4913685) or TGS (847-491-5279).

If the DGS has a conflict of interest, the Chair of the student's department is the next resource. In the case that a student

cannot or does not want to speak with anyone in the program or department, the next resource is TGS. In TGS, the Associate Dean for Student Affairs, William J. Karpus (wkarpus@northwestern.edu), handles student conflict issues and works directly with the academic school Associate Deans and faculty, as needed. DGSs, department chairs, TGS staff, and TGS Deans can treat students' concerns confidentially unless the concerns involve sexual harassment, discrimination, or a safety issue, in which case they are obligated to report the issue to the appropriate University office.

Counseling and Psychological Services

More information on [Counseling and Psychological Services](#) (CAPS).