The University of Chicago
Department of Astronomy and Astrophysics
Graduate Student Handbook
2025-2026

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Key Contacts

In addition to the faculty, there are several offices – departmental, divisional, University – that support your Graduate Education.[1] This guide is intended as a quick reference to help you navigate the many resources available to you. Additional resources can be found on the department website.[2]

Chair
John Carlstrom 773-834-0287, ERC 599E

Deputy Chair for Academic Affairs
Fausto Cattaneo 773-702-0562, ERC 507

PSD Dean of Students
Bahareh Lampert 773-702-8790, ERC 307

Astronomy and Astrophysics/KICP Administrator
Jennifer Smith 834-0393, ERC 599C

- General Inquiries
- Space and Facilities
- Keys
- Visitors
- Web Content
- Hallway Screens

Academic Affairs Administrator
Julia Brazas 773-834-8401, ERC 557

- Curricula
- Academic Issues + Policies
- Course Catalog and Schedule

Student Affairs Administrator
Laticia Rebeles 773-702-9808, ERC 599B

- Graduate Admissions
- Graduate Student Records
- Teaching Assistant Placements
- Graduate Student Payments

Teaching Support Manager
Heather Preston 773-702-8323, KPTC 314

- Undergraduate Lab Management
- Teaching Assistant Training and Supervision
- Instructional Support

Events Administrator
Galen Tsongas ERC 499A

- Colloquia
- Conferences

Systems Administrator
Carolyn Topper 773-702-4247, ERC 495

- Research Computing Support

Ombudspersons
Leslie Rogers 773-834-2436, ERC 537
Daniel Holz 773-834-3306, PRC 435
Office of the Student Ombudsperson

[1] https://grad.uchicago.edu/
[2] https://astrophysics.uchicago.edu/

Program Overview

The Department of Astronomy and Astrophysics offers a full-time scholastic residence program leading to the Doctor of Philosophy (Ph.D.) degree. This document summarizes the curriculum, procedures, and regulations required of students in the graduate program. A statement of University policies and regulations, and expected standards of student conduct that apply to all students, can be found in The University of Chicago Student Manual of Policies and Regulations[3] and the Physical Sciences Division Student Policies.[4] At the end of this handbook is a quick reference guide to key contacts in the department, the Physical Sciences Division (PSD), and the University to assist you with various aspects of graduate student life. Additional resources[5] can be found on the department website.

Program Milestones

The requirements for the Ph.D. in Astronomy and Astrophysics are satisfied through achieving the following milestones:

1. Satisfactory completion of Core and required graduate courses
2. Satisfactory completion of pre-candidacy research projects
3. Completion of the teaching practicum
4. Successful completion of a two-part Candidacy Exam
5. Identification of a Thesis Advisor and topic
6. Formation of a Thesis Committee
7. Thesis research and preparation
8. Final Examination

Meeting these milestones in a timely manner contributes to making satisfactory academic progress leading to the Ph.D.

Mentoring

Each admitted student is assigned a faculty mentor who will help the student navigate graduate school by guiding them to achieve academic and professional goals and supporting their well-being and personal development. The faculty mentor can help students in course selection, advise when difficult situations arise, provide coaching when preparing for candidacy exams, and counsel regarding postdoctoral placement or other career options. Faculty mentors are assigned by the Chair of the Department of Astronomy and Astrophysics. A student can request a change of faculty mentor at any point by contacting the Student Affairs Administrator.

[3] https://studentmanual.uchicago.edu/
[4] https://physicalsciences.uchicago.edu/current-students/policies/
[5] https://astrophysics.uchicago.edu/resources/for-students/departmental-resources-for-graduate-students/

First-year students are also assigned peer mentors to welcome them and provide support as they begin their graduate school career. Peer mentors are assigned to members of the incoming class by current graduate students. Graduate students who are interested in serving as peer mentors volunteer for this role by notifying the Student Affairs Administrator.

Academic Advising

The Deputy Chair for Academic Affairs is the *de facto* Academic Advisor to incoming graduate students when they arrive. Students may also consult with their faculty mentor concerning their program and progress, especially during their first year or until another advising relationship (i.e., research advisor) has been established. Questions regarding academic matters can also be directed to the Academic Affairs Administrator.

Enrollment

The University of Chicago operates on the nine-week quarter system. Students must be enrolled for a minimum of 300 units of coursework per quarter, including summer, to maintain full-time scholastic residence. (One course is equal to 100 units.) Courses are offered in the Autumn, Winter, and Spring Quarters only. During the Summer Quarter, students enroll in 300 units of research. Enrollment opens the week before the quarter begins through the My.UChicago[6] portal.

Participation in the Department

All graduate students are expected to attend the weekly Astronomy Colloquia and to participate actively in colloquia discussions. In addition to the weekly colloquia, there are numerous events offered each week that highlight the research activities of the faculty. It is beneficial for students to attend these events and to meet with faculty informally outside of classes to become acquainted with members of the department. Students may also attend any of the numerous seminars associated with individual research groups. A master schedule of these events[7] is available on the Astronomy and Astrophysics Department website.

Financial Support[8]

Students in our PhD program are generally funded via teaching assignment or research assignment throughout their graduate studies. Effective for students who matriculate Autumn 2024 onwards: most students hold 6 or fewer teaching assignments for their Primary funding over the course of their degree. Students who do not hold research assignments or fellowship stipend positions are required to hold 3 teaching assignments each academic year. Students who are required to hold more than 3 teaching assignments in an academic year will receive additional compensation above their Primary funding amount. For students who matriculated earlier: students who are required to hold more than 3 teaching assignments in an academic year will receive additional compensation above their primary funding amount.

Each Autumn Quarter, all students must submit a Graduate Research Advisor (GRA) form to the Student Affairs Administrator. This form is used to help the department anticipate the need for TA placements in the coming year and to identify possible fellowship candidates. If full-year funding is not in place by the start of the Autumn Quarter, the GRA form *must be updated quarterly*. The Student Affairs Administrator will contact students each quarter to confirm their status; however, if the student's status changes at any point, they must promptly contact the Student Affairs Administrator.

The process of identifying, applying for, and securing funding is an integral part of the academic enterprise. Students are encouraged to seek out external fellowships, as these provide them with both financial support and the flexibility to focus on research goals of individual interest. UChicagoGRAD[9] offers resources and support for seeking external fellowship opportunities, as does Pivot.[10] (Pivot is also helpful for tracking future postdoctoral opportunities.) The department will also forward external fellowship opportunities to the graduate student mailing list when these opportunities are known.

Students must notify the Student Affairs Administrator immediately upon receiving an external fellowship. Some external fellowship awards fall below the amount of the Physical Sciences Division's full graduate student salary. In such cases, either the student's Research Advisor or the department will "top up" the award to the PSD salary level as needed. Those receiving external fellowships that provide salary higher than the PSD level will receive the full salary determined by the fellowship.[11]

Payment Schedule

Incoming graduate students receive 4 payments during Autumn quarter and 3 payments thereafter. Continuing students are paid on a monthly schedule on the last day of the month (3 payments per quarter).[12] Note that monthly pay periods do not align with academic quarters.

Academic Quarter	Autumn	Winter	Spring	Summer
Dates (approximate)	October-December	January-March	March-June	June-August
Pay Periods	October-December	January-March	April-June	July-September

[9] https://grad.uchicago.edu/fellowships
[10] https://ura.uchicago.edu/page/pivot
[11] Any top-up arrangements made prior to Jan. 1, 2024, will be honored.
[12] Summer graduates receive their payment in two deposits.

Academic Expectations

Satisfactory Academic Progress

All graduate students are expected to achieve the program milestones for the Ph.D. in Astronomy and Astrophysics on a timely basis to maintain satisfactory academic progress and remain in Good Standing in the Physical Sciences Division. Academic expectations of the department are as follows:

- Students are expected to attend classes for the fully scheduled class period.
- Students are expected to participate collegially, honestly, and ethically in all course and research activities.
- Students are expected to maintain an average grade of B (3.0 on a scale of 4.0) or better in their course work at the 300-level.
- Students are expected to attend the weekly Astronomy Colloquia and to participate actively in colloquia discussions.
- Students must complete all required courses to be eligible for part two of the Candidacy Exam.
- Students must strive to develop the professional competencies of an early career scientist (see section on *The Candidacy Examination*).
- Students must address any recommendations put forth by the Candidacy Committee that arise in candidacy exams by demonstrating progress toward improvement.
- Within one quarter of successfully passing the second Candidacy Exam, the student must identify a Thesis Advisor, thesis topic, and form a Thesis Committee.
- Once a Thesis Committee is formed, the student must meet with the group at least twice per year and notify the Student Affairs Administrator of the meetings.

All Ph.D. students in the Physical Sciences Division complete a fifth-year check-in process in Autumn Quarter of their fifth year of study. This check-in process is designed to ensure that students are on track to complete degree requirements within their registration limits and have a clear plan for completing their dissertation and receiving their degree.[13]

If a student does not reach program milestones and maintain satisfactory academic progress leading to program completion in seven years, they are deemed to be not in Good Standing and may be placed on Academic Probation. Students on Academic Probation will be informed in writing about the expectations for how they may return to Good Standing and are given a timeline for completion of those requirements, generally a minimum of one quarter. Students who are unable to meet the expectations outlined in the Academic Probation letter may not be permitted to continue in the program. Please contact the Student Affairs Administrator or Deputy Chair for Academic Affairs for any questions about relevant degree milestones or maximum timelines for completion of requirements.

[13] https://physicalsciences.uchicago.edu/academics/dean-of-students/policies-for-current-students/phd-student-fifth-year-check-in/

Grade Expectations

- As noted above, all Core and required courses are taken for a quality (letter) grade.
- Students are expected to maintain a minimum 3.0 GPA on a scale of 4.0. If a student falls below this average, the Deputy Chair for Academic Affairs, in consultation with the student and other faculty, will identify appropriate actions for enhancing academic progress.
- If the student wishes to receive a letter grade for a research course, it must be requested prior to the end of third week of the quarter (the end of the add/drop period).
- Once grades are submitted it is not possible to change a P to a letter grade or a letter grade to a P.
- A student may choose to take elective courses P/F, R (audit) or for a quality grade, subject to instructor and departmental approval.
- P/F grading must be requested before the midpoint of the quarter. The grade P has no point value but confers credit.
- Students who receive instructor permission to audit a course should contact the Student Affairs Administrator prior to the end of third week of the quarter (the end of the add/drop period) to receive approval and have any approved changes made to their registrations.
- The grade R has no point value and confers no credit. Ph.D. students need to maintain 300 units of registration in addition to an audited course because audited courses do not confer any amount of credit.
- In exceptional situations, the grade of I (Incomplete) may be given when a student has substantially completed a course but is unable to finish it before final grades are due. Students should discuss the possibility of an incomplete with their instructor as soon as they become aware that they may not be able to complete all course requirements by Friday of the last full week of instruction of the quarter, at the latest.
- If an instructor agrees to an incomplete, the agreement must be submitted in writing (e.g. email) to the Student Affairs Administrator, specifying the work remaining to be completed and the due date for the work.
- Students who do not wish to complete a course after Friday of third week of a quarter may request a withdrawal (“W”) from the course.

Pre-Candidacy Milestones

MILESTONE 1: Core and Non-Core Courses

Students complete the Core and non-Core courses in the first two years of graduate study (during the pre-candidacy stage). All Core and non-Core courses are taken for a quality (letter) grade. Satisfactory completion of courses is required to advance to candidacy. **Students who matriculated prior to Autumn 2025 should refer to the Graduate Announcements[14] that was issued in the year in which they matriculated, or consult with the Deputy Chair for Academic Affairs, if questions arise regarding program requirements.**

The Core courses are:

- ASTR 30100 Stars
- ASTR 31000 Cosmology I
- ASTR 30400 Galaxies
- ASTR 30350 Exoplanets
- ASTR 31100 High Energy Astrophysics
- ASTR 30600 Radiation Measurements

The non-Core courses are:

- ASTR 34000 Statistical Methods in Astrophysics
- ASTR 35000 Order of-Magnitude Astrophysics
- ASTR 49910 Graduate Seminar: Colloquium
- ASTR 49920 Graduate Seminar: Fellowship and Proposal Writing
- ASTR 49930 Graduate Seminar: Candidacy Preparation
- Electives numbered in the 300s and 400s that provide more depth in particular areas, allowing students to explore topics of interest.

Placing out of Core Courses

A student entering the graduate program in Astronomy and Astrophysics with a Master's Degree may place out of one or more of the Core courses by demonstrating completion of a similar-level course at a previous institution. Students seeking a course waiver should submit an approved Graduate Core Course Waiver Petition form to the Student Affairs Administrator no later than the first week of the quarter in which the waiver is sought. The form requires the course instructor's signature in support of the petition; however, final approval is granted by the Deputy Chair for Academic Affairs. Students eligible

[14] https://registrar.uchicago.edu/registration/course-catalogs/

for this option can obtain the form from the Student Affairs Administrator or the Student Resources[15] webpage. In place of the waived course, a substitute course taken for a quality (letter) grade will be allowed to satisfy the Core requirement. Students should consult with the Core course instructor or Deputy Chair if they need guidance in choosing an appropriate replacement course.

Substituting Non-Core Courses

Students may substitute selected non-Core courses in the Astrophysics program accordingly:

- First-year students may choose an approved elective in place of ASTR 49920 Graduate Seminar: Fellowship and Proposal Writing in the Spring Quarter.
- Second-year students may choose an approved elective in place of ASTR 34000 Statistical Methods in Astrophysics in the Winter Quarter or ASTR 49930 Graduate Seminar: Candidacy Preparation in the Spring Quarter.

Students are encouraged to consult with the Deputy Chair for Academic Affairs, their research advisor, faculty mentor or other faculty member as to appropriate courses that coordinate with their research interests. Substitute courses must be approved by the Deputy Chair in consultation with the research adviser.

Grading Policy

- All Core and required courses are taken for a quality (letter) grade.
- ASTR 37100 Pre-Candidacy Research, as well as ASTR 49400 Post-Candidacy Research, are typically taken P/F, but a letter grade may be requested by the student.
- Elective courses may be taken P/F, R (audit) or for a quality grade, subject to instructor and departmental approval.[16]
- Elective courses that substitute for a non-Core course must be taken for a quality (letter) grade.

Students should notify the course instructor prior to the end of third week of the quarter (the end of the add/drop period) to request P/F or R grading. Please refer to the section below on *Grade Expectations* (page 5) and the PSD Grading Policies[17] for additional information.

[15] https://astrophysics.uchicago.edu/resources/for-students/departmental-resources-for-graduate-students/
[16] The grade P has no point value but confers credit. The grade R has no point value and confers no credit.
[17] https://physicalsciences.uchicago.edu/current-students/policies/grading/

Pre-Candidacy Schedule

Core courses should be taken in the order indicated in the table.

	Autumn	Winter	Spring	Summer
Year 1	ASTR 30100 Stars	ASTR 31000 Cosmology I	ASTR 30400 Galaxies	ASTR 37100 Pre-Candidacy Research (300 units)
	ASTR 35000 Order-of-Magnitude Astrophysics	ASTR 49910 Graduate Seminar: Colloquium	ASTR 49920 Graduate Seminar: Fellowship and Proposal Writing*	
	ASTR 37100 Pre-Candidacy Research	ASTR 37100 Pre-Candidacy Research	ASTR 37100 Pre-Candidacy Research	
Total	300 units	300 units	300 units	300 units
Year 2	ASTR 30350 Exoplanets	ASTR 31100 High Energy Astrophysics	ASTR 30600 Detection of Radiation	ASTR 37100 Pre-Candidacy Research (300 units)
	Elective	ASTR 34000 Statistical Methods in Astrophysics*	ASTR 49930 Graduate Seminar: Candidacy Preparation*	
	ASTR 37100 Pre-Candidacy Research	ASTR 37100 Pre-Candidacy Research	ASTR 37100 Pre-Candidacy Research	
Total	300 units	300 units	300 units	300 units

* May be substituted with an approved elective.

MILESTONE 2: Pre-Candidacy Research

In the first two years of the program, students undertake research projects in the course ASTR 37100 Pre-Candidacy Research. The course aims to facilitate opportunities for students to gain broad exposure to, and engage in, faculty research activities. While this results in work that is presented at the Candidacy Exams, pre-candidacy research projects are not expected to develop into thesis research.

Students may contact a faculty member directly to arrange for a research project as part of ASTR 37100, or they may consult with their faculty mentor or the Deputy Chair for Academic Affairs for guidance in

identifying a research supervisor. Students must have arrangements with their research supervisors in place before enrolling in this course.

MILESTONE 3: *Teaching Practicum*

All students must fulfill a teaching practicum for a minimum of two quarters; Research Assistantships for a single quarter or multiple quarters are provided by faculty members.

Pedagogical training is part of the professional development and academic requirements of graduate students. Teaching assignments primarily include independently teaching lab sections for non-science majors, and sometimes, collaborative teaching with the faculty instructor of lecture courses in the Major in Astrophysics program. When assigned as a Teaching Assistant (TA) in undergraduate lab courses, the TA is responsible for the lab instruction and will work in consultation with the course instructor and the Teaching Support Manager to prepare for and carry out this work. The Chicago Center for Teaching and Learning[18] offers professional development to TAs through its programs and online resources.

The teaching practicum is typically completed in the first year of graduate studies but need not be accomplished in consecutive quarters. Students who matriculate with external funding, such as a National Science Foundation Graduate Fellowship, should consult with the Student Affairs Administrator regarding completion of the teaching practicum requirement.

Teaching Assignments

Courses with first-year Teaching Assistants are:

ASTR 12600 Matter, Energy, Space and Time - Autumn
ASTR 12610 Black Holes - Winter
ASTR 12620 Big Bang - Spring
ASTR 12700 Stars - Autumn
ASTR 12710 Galaxies - Winter
ASTR 12720 Exoplanets - Spring

The courses numbered 126XX are the more "theoretical" courses and those numbered 127XX are more "observational." Incoming students are assigned based on their stated research interests. Exact lab section assignments are determined by the TAs in consultation with the Teaching Support Manager. Subsequent assignments for first-year students typically remain within the sequence (12600-12610-12620 or 12700-12710-12720).

[18] https://teaching.uchicago.edu/

Second-year+ ("advanced") TAs assignments are typically allocated to courses in the Astrophysics Major, including but not limited to ASTR 13300 Introduction to Astrophysics (Spring) and ASTR 24100 Physics of Stars (Winter).

Process and Timeline for Making TA Assignments

- In the first week of a new quarter, the department submits a schedule of classes for the *next* quarter to the Registrar (e.g., in the first week of Autumn Quarter, the Winter Quarter schedule is submitted).

- The schedule includes the day/time for the lecture and all lab sections. These are scheduled to avoid conflicts with other courses in departmental programs (e.g., no conflicts with graduate courses or other courses taken by students in the College).

- The schedule includes the estimated size of the class (the number of seats). The number of seats is based on historical enrollment data and the number of expected TAs for the quarter (informed by and GRA forms). The estimated ratio is 24 undergraduates per one TA.

- Because the GRA form is used to project how many students will need a teaching assistant position every quarter, it must be updated regularly to make sure the ratio of undergraduates to TAs is accurate when the schedules are made. Changes to the GRA form need to be submitted to the Student Affairs Administrator **no later than week 5** of the current quarter for the next quarter.

- Early in week 9 of the quarter the enrollment estimates are provided by the Registrar. This information is used to ensure the correct number of TAs are available support all classes and assignments can be made.

Changing Assignments

When a student wants to change the course sequence to which they are assigned (126xx or 127xx), it may be possible to do so depending on the following considerations:

- The number of TAs needed for a particular course
- Continuation in a sequence as a more advanced peer to help first-year TAs
- Faculty member request for a specific student

Advanced students can make course preferences known in advance to the Teaching Support Manager so that these can be taken into consideration.

Candidacy Examinations

MILESTONE 4: Successful completion of a two-part Candidacy Exam

Advancement to candidacy involves an examination given in two parts prior to the start of the Autumn Quarter. These are taken by students as they begin their second and third years of graduate study. The general format of the exam is a presentation by the student on a short-duration project completed in ASTR 37100 Pre-Candidacy Research, followed by an oral exam exploring the student's research and its connection to broader astrophysical topics. The purpose of the exams is to assess the student's development as a researcher and their deepening conceptual understanding of astronomy and astrophysics at the midpoint and the end of their formal academic program. Generally, students should be able to demonstrate increasing competence in the following areas during the Candidacy Exams:

- Skill at the analysis of a research problem and presentation of that analysis in oral and written presentations.
- A broad general knowledge of astronomy and astrophysics.
- A maturing, deeper technical knowledge of one or more subfields of astronomy and astrophysics, as reflected in insightful responses to questions at the oral exam.
- Progressive ability to complete a full research project.

To maintain timely academic progress, students are expected to participate in the exams when they are scheduled. Only in exceptional circumstances unrelated to academic matters may an exam be rescheduled at the student's request. In such circumstances, the student should contact the Deputy Chair for Academic Affairs. Students may be prevented from taking candidacy exams if they are not making satisfactory academic progress by completing the Core courses.

Part One of the Exam

Candidacy I takes place at the beginning of the second year of graduate study two weeks prior to the start of the Autumn Quarter (approximately mid-September). Students should practice their presentation with their research advisor in advance of the exam. Students are required to provide their presentation materials to the Chair of the Candidacy Committee three days in advance of the exam so that Committee members can familiarize themselves with the material and references to devise appropriate questions. (Sample questions from past exams can be found here.[19]) The exam is attended by the Committee members and student's research advisor(s). The student's faculty mentor may also be invited to attend.

[19] https://docs.google.com/document/d/11hdSgT9kQu5h6FtrMhvX_vVe7AeLPKYgXEMXeYHcNaM/edit?usp=sharing

Exam Format – Part One

At the exam, the student makes an oral presentation, 20 minutes in length, on a short-duration project (1-2 quarters of research) completed in the ASTR 37100 course. Questions are held until the presentation is over. In the remaining time (approximately 40 minutes), the student will respond to questions from the Candidacy Committee. The research presented will drive the questions posed by the committee. These will likely begin with "big picture" questions related to the presented research (scientific motivation and framing), moving on to questions probing connected aspects of the references in the presentation, and connections between the presented work and academic courses taken previously. Specific Core course content is not typically probed in detail; however, it may be in cases where a student received a low grade or if the student does not demonstrate an understanding of the broader connection of their research to Core course content.

Outcomes of Part One

Students will receive a report from the Chair of the Candidacy Committee generally one to two weeks following the examination. The report considers the student's exam performance and input gathered from the student's research advisor and other engaged faculty and provides feedback on the student's progress and any relevant suggestions for changes in focus or effort that the committee sees as helpful in progressing to a successful completion of the second part of the Candidacy Exam. If the committee identifies substantive issues during the exam, the report will provide explicit guidance on areas that must be improved. Demonstrating improvement on the areas identified by the committee is a condition for passing part two of the exam. Students will meet individually with the Deputy Chair to review the Committee's report on their examination and to discuss next steps.

Part Two of the Exam

Candidacy II takes place at the beginning of the third year of graduate study <u>two weeks</u> prior to the start of the Autumn Quarter (approximately mid-September). Students should practice their presentation with their research advisor in advance of the exam. Students are required to provide their written report to the Chair of the Candidacy Committee one week in advance of the examination so that Committee members can familiarize themselves with the material and references to devise appropriate questions.[20] Failure to present the written report may result in the committee not examining candidate, thus impeding satisfactory academic progress. The exam is attended by the Committee members and student's research advisor(s). The student's faculty mentor may also be invited to attend.

[20] Sample questions from past exams can be found at https://docs.google.com/document/d/11hdSgT9kQu5h6FtrMhvX_vVe7AeLPKYgXEMXeYHcNaM/edit?usp=sharing

Exam Format – Part Two

At the exam, the student makes an oral presentation on a longer duration project (3-4 quarters of research) completed in ASTR 37100, accompanied by written report. The presentation need not be about the same subject as the written report (i.e., students may submit a written report on a longer duration project but present on a new research direction). The presentation should be given in the style of a standard research seminar lasting approximately 45 minutes, followed by questions about the research and the broader context for it. Candidacy II may last up to 90 minutes.

Requirements for the Written Report

- The report must be primarily written by the student. (Attestation for this will be made by the research advisor.)
- The content of the report should be of scientific relevance and meet the standards for publication in an international scientific journal.
- The report should be submitted for publication in a relevant journal in the student's field by the time of the examination.[21]
- If the report has not been submitted for publication by the time of the exam, the advisor must provide written attestation that the report is written by the student and is of a style, length, and quality of articles in the student's field, and should be allowed to satisfy the written requirement of the exam.

Outcomes of Part Two

In determining a recommendation for advancement to candidacy, the Candidacy Committee considers the student's presentations and exam performance, input from the student's research advisors (instructors of ASTR 37100), and grades and comments from instructors of the Core courses. A recommendation for advancement is made by the Candidacy Committee to the Deputy Chair for Academic Affairs: pass, provisional pass, or not pass. In all cases, students will meet individually with the Deputy Chair to review the Committee's report on their examination.

Pass

Advancement to candidacy is recommended when a student has successfully demonstrated proficiency in the candidacy competencies.[22]

[21] A student may not defer candidacy if the report has not yet been submitted.

[22] Skill at the analysis of a research problem and presentation of that analysis in oral and written presentations; a broad general knowledge of astronomy and astrophysics; a maturing, deeper technical knowledge of one or more subfields of astronomy and astrophysics, as reflected in insightful responses (e.g., understanding and applying knowledge) to questions at the oral exam.at the oral exam; and progressive ability to complete a full research project.

Provisional Pass

A student will be awarded a provisional pass if they demonstrate some of the candidacy competencies but not others and will be permitted to retake the Candidacy II exam.

1. They will be given feedback on which competencies were satisfactorily demonstrated, and which remain to be demonstrated, with specific guidance from the committee on areas in which they need to improve and resulting expectations.
2. Students may be asked to demonstrate that they have addressed the concerns raised by the committee with a revised written report, additional oral presentation, answers to questions about their research context or astrophysics in general, or some combination thereof, depending on the committee's recommendation.
3. They will be asked to return in 3-6 months to demonstrate the remaining competencies.

Students who do not pass the return exam will be awarded a Master's degree, and their graduate student status will be terminated at the end of the quarter following the quarter in which they take their return exam (e.g., if the student does not pass the return exam in Winter Quarter, their status will be terminated in Spring Quarter). Administrative questions regarding this transition in status should be directed to the Student Affairs Administrator.

Not Pass

Students who do not pass Candidacy II will be granted a Master's Degree. Their graduate student status will be terminated at the end of the quarter in which they take their exam (e.g., if the student does not pass the exam before the start of Autumn Quarter, their status will be terminated at the end of Autumn Quarter). Administrative questions regarding this transition in status should be directed to the Student Affairs Administrator.

Petitioning Candidacy Exam Outcomes [23]

In exceptional cases, students who receive a Not Pass on the second part of the Candidacy Exam may petition to retake it 3-6 months later. Such petitions must be filed within one month of the student

[23] A student who receives a Provisional Pass and does not pass the return exam is not eligible to petition a Not Pass.

being informed of their Candidacy result. In such cases, the Department Chair or Deputy Chair for Academic Affairs will set up an *ad hoc* faculty committee to consider the petition and make a recommendation to the Chair or Deputy Chair. The committee will consider the student's petition as well as input from the student's research advisor, faculty mentor, the student's graduate Core course instructors, and the Academic Affairs coordinator. The *ad hoc* committee will make a recommendation, and the department will decide on the petition within one month of its filing. The decision of the committee is final: A student who does not pass the return exam is not eligible for further petitions, and their status will be terminated in the quarter in which the committee makes their decision. The Petition to Retake Candidacy II Form is available from the Academic Affairs Administrator.

Advancing to Candidacy

MILESTONE 5: Identification of a Thesis Advisor and Topic

Following successful completion of the second Candidacy Exam, the student formally chooses a Thesis Advisor and thesis topic and forms a Thesis Committee. The primary charge of the Thesis Committee is to evaluate the scientific progress of the student and to suggest directions in research that will culminate in a successful thesis. The Thesis Advisor serves as the chair of the Thesis Committee and plays the primary role in ensuring that the committee meets all its responsibilities. The advisor will help guide the student in the selection of appropriate committee members to ensure broad representation from among the faculty. For example, if the thesis is of a theoretical nature, it is appropriate to include an experimentalist/observer on the committee. Likewise, if the thesis is of an experimental/observational nature, one committee member should be a theoretician. **The proposed thesis title and committee members are submitted to the Deputy Chair for Academic Affairs for approval no later than the end of the Autumn Quarter[24] following successful completion of Candidacy II.**

- The Thesis Advisor must be a member of the teaching faculty at the University of Chicago, or a member of the research faculty in the Department of Astronomy and Astrophysics.
- The student and Thesis Advisor determine a thesis topic and generate a proposed thesis title.
- This Milestone must be completed no later than the end of the quarter following successful completion of the second Candidacy Exam.

MILESTONE 6: Formation of a Thesis Committee

There are four members in a committee: the Thesis Advisor and three others. The student consults with the Thesis Advisor to identify committee members:

a) At least two members must be on the teaching faculty in the Department of Astronomy and Astrophysics.
b) Remaining committee members may be selected from the faculty in the Physical Sciences Division and scientists with appointments at Argonne or Fermilab.
c) External members (individuals not affiliated with the University of Chicago, Argonne or Fermilab scientists) are permitted to join a Thesis Committee.
d) It is possible to have more than four members serve on a Thesis Committee.
e) If the Thesis Advisor is a member of the research faculty, a committee member from the teaching faculty must be identified as *pro forma* advisor to serve as nominal chair of the thesis committee and as faculty of record when the student registers for ASTR 49400 Post-

[24] If candidacy is delayed, the Thesis Committee should be completed by the end of the quarter immediately following advancement to candidacy.

Candidacy Research. The department will rely on that member of the teaching faculty to help ensure that the student is making appropriate progress toward the Ph.D. degree

To obtain approval of the Committee

a) The student submits in writing (e.g. email) the proposed Thesis Committee and thesis title to the Deputy Chair for Academic Affairs and the Thesis Advisor.
b) The Deputy Chair will approve the proposed committee or recommend alterative members within one week of receiving the written communication from the student.

At this point the student is eligible to apply for admission to Candidacy for the Ph.D. degree, a process governed by regulations of the Division of the Physical Sciences and administered by the PSD Dean of Students. The student completes Part 1 of the Admission to Candidacy form (available from the Student Affairs Administrator and the Student Resources[25] webpage) selecting Doctor of Philosophy. After the completed form is submitted to the Student Affairs Administrator, the student is free to contact the full Thesis Committee to schedule a first meeting.

Changes to the Thesis Committee

Once established, changes to the Thesis Committee require special approval from the Deputy Chair for Academic Affairs and/or the Department Chair. A student seeking a change in the committee composition must submit a written justification (e.g., email) for the request to the Deputy Chair for Academic Affairs. Depending on the nature of the justification, the Deputy Chair may engage the Thesis Advisor or other committee members to determine an appropriate resolution within one month of the student's written request.

In extenuating circumstances (e.g., death or sudden leave), the Thesis Committee, Deputy Chair and/or Chair, and the student will collectively determine an appropriate replacement member for the committee.

[25] https://astrophysics.uchicago.edu/resources/for-students/departmental-resources-for-graduate-students/

Thesis Presentation

MILESTONE 7: Thesis Research and Preparation

After admission to candidacy is established, the student enrolls in ASTR 49400 Post-Candidacy Research, and may also take electives of advanced coursework, for a minimum of 300 units per quarter (including Summer Quarter). Until the Thesis Committee is in place, students continue to enroll in ASTR 37100 Pre-Candidacy Research. Students may also enroll in courses following advancement to candidacy, including courses offered outside of the Physical Sciences Division.

Once a Thesis Committee is formed, **the group is expected to meet at least twice per year to review progress on the thesis project**. The student is responsible for arranging the meetings. Prior to each meeting, the student must obtain a Bi-Annual Report Form from the Student Affairs Administrator for completion by the student and Thesis Advisor. The completed form must be returned to the Student Affairs Administrator.

Academic Progress

Independent research is the hallmark of advanced study. An important responsibility of doctoral candidates is to communicate progress or problems in their research to the Thesis Advisor and committee. Students should contact the Student Affairs Administrator, the Deputy Chair for Academic Affairs, or PSD Dean of Students should they encounter issues that prevent them from making academic progress. For students matriculating into graduate programs in the Physical Sciences Division beginning in Summer 2017, the registration limit is seven years. Students who exceed these limits will be administratively withdrawn from their degree programs. For more information on registration limits, please contact the Dean of Students in the Physical Sciences Division.

Thesis Format

A thesis is accepted as satisfying the requirements of the Department of Astronomy and Astrophysics for the Ph.D. when it is approved by the Thesis Committee and has been, or will be, submitted for publication in a recognized scientific journal. (A paper that is deemed by the Thesis Committee to be in a state that can be submitted to a journal, or that is in review at the time of the oral defense, is sufficient to meet this requirement.) Each published paper that is submitted as (part of) a thesis must carry a notation, preferably on the first page, as follows:

> *Presented as (part of) a thesis to the Department of Astronomy and Astrophysics, The University of Chicago, in partial fulfillment of the requirements for the Ph.D. degree.*

The published thesis must also contain acknowledgements to fellowships or traineeships held during the research period as well as to research grants and other sources of support.[26]

In the case of a single-author paper, the thesis is the manuscript submitted for publication, plus any supplementary appendices augmenting the presentation that might not be appropriate in a published paper. In the case of a multiple-author paper or papers (which also must fulfill the requirement of submission for publication), the thesis must be an extended version, written solely by the student and describing in detail his or her contributions to the published work. In both cases, the student's Thesis Committee should approve the planned work at least three quarters before the Final Examination. Both types of theses (single-author paper or extended single-author version of the multiple-author paper) must be submitted in the required University-standard format. Information on formatting requirements and deadlines are available from The University of Chicago Dissertation Office.[27] Students are strongly encouraged to contact the Dissertation Office to confirm deadlines[28] and requirements at least one quarter before they intend to hold their final examination. The student is responsible for ensuring that the thesis complies with the submission and acceptance guidelines of the Dissertation Office before the Ph.D. degree can be awarded.

MILESTONE 8: Final Examination

The Final Examination, or oral defense, marks the candidate's professional entry into scholarship. The thesis forms the basis of the examination, which is conducted by the Thesis Committee. The defense is a public event at which the candidate will present their research to the Thesis Committee, engage in dialogue and debate with the committee, and receive constructive criticism from them. Students are encouraged to practice their thesis presentations in advance with a variety of audiences, including the Thesis Advisor, postdoctoral scholars, and other graduate students. Prior to the defense, the student must obtain the Report of Final Examination for the Degree of Doctor of Philosophy form from the Student Affairs Administrator, to be completed at the end of the Final Examination.

Scheduling the Examination

It is the responsibility of the student to arrange the date and time of the Final Examination. The date chosen should be coordinated with the Thesis Advisor and Committee, keeping in mind quarterly academic calendar deadlines[29] for the submission of the thesis and degree conferral.

- Final examinations may be held in any quarter.
- Final theses are due to the Registrar the 7th week of the quarter in which the degree is to be conferred. Consider scheduling the final examination no later than 5th week of the quarter to allow time for the Dissertation Office to review your final submission.

[26] See also https://studentmanual.uchicago.edu/academic-policies/dissertation-requirements/
[27] https://www.lib.uchicago.edu/research/scholar/phd/
[28] https://www.lib.uchicago.edu/research/scholar/phd/students/dissertation-deadlines/
[29] https://registrar.uchicago.edu/calendars/quarterly-conferral-annual-convocation/

- **If the date of the final examination is scheduled during the Summer Quarter and the student and Thesis Advisor want to continue research past the last day of the quarter, they must agree on an employment plan, and the Student Affairs Administrator must be notified of the plan.**
- International students are eligible to apply for STEM Optional Practical Training (OPT).[30] Students must apply for this before degree conferral. Contact the Office of International Affairs[31] for important deadlines and procedures.

Preparing for the Final Examination

1. A complete copy of the thesis must be submitted to the committee four weeks before the examination. This is *not* meant to be a draft but the version that the student and their Thesis Advisor consider to be complete.

2. The committee shall transmit to the student in writing major comments and concerns regarding the substance and presentation of the thesis at least 2 weeks before the examination, highlighting any *major* revisions needed in advance of the defense. [The committee may request minor edits (e.g., stylistic, grammatical, etc.) to be completed either before or after the defense.]

3. If the committee feels that there are *substantive* issues with the thesis that would likely take longer than one week for the student to resolve, the chair of the committee can move to delay the thesis defense until such time as they can be resolved.

4. If it is the consensus of the committee that the thesis (even with recommended revisions) will not meet the requirements of the Ph.D., the chair of the committee will communicate this to the Deputy Chair for Academic Affairs. In this case, progress toward the examination will be paused, and the committee (or committee chair) will confer with the Deputy Chair and the student on possible paths forward.

5. Assuming that committee comments can be satisfactorily addressed without delay, the student shall deliver a revised version of thesis that includes any changes/revisions requested by the committee no later than one week before the examination. (If the requested edits are minor, this step can be skipped, see item 2 above.) If the committee raised substantive issues previously, and those issues are not addressed in the revised version, then the committee chair may move to delay the examination until such time as they can be resolved. Such a decision should be taken and communicated to the student no less than 5 days prior to the scheduled exam.

[30] https://internationalaffairs.uchicago.edu/students/current-students/stem-opt-extension
[31] https://internationalaffairs.uchicago.edu/about-us

Exam Format

The presentation should be given in the style of a standard research seminar lasting approximately 45 minutes, followed by questions about the research and the broader context for it. The Final Examination may last up to 75 minutes.

Outcomes of the Final Examination

Following the oral defense, the committee will confer privately to decide whether to accept or reject the defense of the dissertation or accept the thesis with qualifications.

Accept

The committee accepts the thesis and signs the Final Examination for the Degree of Doctor of Philosophy form, which recommends the candidate for the degree of Ph.D. This form is submitted to the Student Affairs Administrator. The committee may request minor edits (before or) after the exam and request that the student deliver a final, further revised thesis to the committee prior to degree conferral.

Reject

The committee deems the thesis unacceptable, and the candidate is not recommended for the degree of Ph.D. Rejection is an exceptional event.

Accept with Qualifications

The committee accepts the thesis with qualifications, specifying what further work will need to be done. In this case, the committee's request for further work will be communicated in written form no later than 2 days after the examination and the chair will discuss a specified timetable for the requested work with the student. The committee will determine and communicate whether receipt of and sign-off on the further revised thesis is sufficient or whether a follow-up meeting of the student with the committee is required.

Submission to a Journal

The Department requires that at least one major single- or multiple-authored paper based on the thesis be submitted to appropriate refereed journal.

Preparing for Graduation

Students planning to graduate Apply to Graduate in their My.UChicago[32] portal. The application must be submitted by the Friday of the 1st week of the start of the quarter in which a student expects to graduate. The application is valid only for the quarter for which it is made. If the degree is not granted at the end of the quarter in which it was expected, the student must reapply before the deadline of the next quarter. Students should consult the Academic Calendar[33] for registration dates and deadlines and the Registrar's webpage for graduation procedures.[34]

Students who expect to receive a degree must have fulfilled all financial obligations to the University by the end of the 9th week of the quarter in which they expect to receive a degree (8th week in Summer Quarter). Students who fail to meet this obligation will be removed from the list of degree candidates and must re-apply for a degree after settling their accounts. Students who have questions or wish to make special arrangements for payment should make an appointment with the Office of the Bursar[35] well in advance of the deadline for fulfilled the financial obligations.

[32] https://my.uchicago.edu/
[33] http://www.uchicago.edu/academics/calendar/
[34] https://registrar.uchicago.edu/graduation/application-to-graduate/
[35] https://bursar.uchicago.edu/

Notes