

# The Grad Student Handbook

by Various Authors

August 24, 2009

Several people have contributed to this document including Jeff Crane, Peter Frinchaboy, Jeff Carlin, Joshua Kempner, Chris Palma, and Paul Ries. All contents, including errors, inaccuracies, and omissions, are the sole property and responsibility of the authors and the University of Virginia Department of Astronomy.

*Another Fine Work by It's a Shame About Ray Productions  
©2009 University of Virginia Department of Astronomy*

This handbook is meant to provide an informal introduction to grad student life in the Astronomy Department at UVa, as well as to provide information which is of interest to all grad students but which is omitted from the handbook that the department chair publishes. Keeping with an informal style, we've mixed together both important facts and personal tips based on the collective experience of the authors. The occasional grad student might disagree slightly with some of our tips, but in general most grads have successfully lived by these rules of thumb. Most of it should be discussed at the grad meeting at the beginning of each academic year.

## 1 Grad Responsibilities

The following is an attempt to summarize the basic requirements and rules of thumb that you should observe in order to be successful in this grad program. Through all of this, keep in mind that you are only admitted to the Master's program in Astronomy when you first come to UVa. In order to be granted admission to the Ph.D. program, you have to jump through a series of hoops, the most significant of which is taking the qualifying exams. In everything you do for your first two years, keep in mind the impression you are making on those who hold your fate in their hands. When the faculty meet to discuss grad student progress after the qualifying exams are complete, they will decide whether each student has been doing sufficiently well to continue in the program. Your mission in life during your first 2 years should be to make sure that you look impressive in all areas when that meeting comes around.

### 1.1 Course Work

The information here is intended for those students who are entering the program with no transfer credit for graduate course work. If you are entering UVa with a Master's degree or transfer credit of some kind, the details may differ for your case.

You will be taking classes for your first two years. During a typical semester, two 3-credit astronomy courses are offered as well as the 1-credit Current Topics course, ASTR 8500. You should register for these three courses, one 3-hour physics (or related field) course, and 3 credits of ASTR 9995, which gives you regular course credit for doing research. Occasionally 3 astronomy classes will be offered instead of 2. In these semesters, if you take a third astronomy class it should be in place of the physics class. You should *always* take at least 3 credit hours of research.

	Year A		Year B	
Units	Fall	Spring	Fall	Spring
3	High Energy	ISM	Stellar I: Interiors	Stellar II: Atm.
3	Radio Astronomy	Galactic Ast.	Ast. Techniques	Extragalactic Ast.
3	Phys/Other	Astro/Phys	Phys/Other	Astro/Phys
1	Astro 8500	Astro 8500	Astro 8500	Astro 8500
3-4	Astro 9995	Astro 9995	Astro 9995	Astro 9995

NOTE: This is the standard schedule. Sabbaticals, etc may change this.

One of the requirements for the Ph.D. is 54 credit hours other than “non-topical research” (ASTR 8999, 9999). The standard course load in the first 2 years is 3 classes at 3 credits each, 3 hours of directed research (ASTR 9995), and ASTR 8500, for a total of 13 hours. *With this standard load, you will end up 2 credit hours short after 2 years!* There’s a very simple remedy for this: you should either take 4 hours of 9995 each semester in your second year, or take 5 hours of 9995 in your 4th semester.<sup>1</sup> **During the summers you should register for ASTR 8999 or ASTR 9999 rather than 9995 to avoid paying exorbitant tuition and fees.**

After your second year, assuming you pass all your classes, your formal course work will be complete. Each semester thereafter, you should register for 12 credits of non-topical research (ASTR 9999). During the summers, you will also want to register for 6 hours of ASTR 9999.

The best advice to be given here is: **PASS YOUR CLASSES!** This is important. Anything above and including a B– is considered passing. Failing a class means that the grad advisor has to write a letter to the dean explaining why you should not be kicked out of the University. This makes you look bad when it comes time for the faculty to evaluate your progress.

For your physics courses, you are generally encouraged to include Quantum Mechanics and E&M, but this isn’t a strict requirement. Use your judgment and ask senior grads. Physics courses at UVa aren’t known for being consistently excellent (read: several of us have had some pretty awful classes). Ask around for recommendations/cautions about instructors before signing up for a class. In recent history, however, there have been very few opportunities to take courses outside the department....

If you are in your third year or above, you are required to attend Journal club, which is on Mondays at noon presently.

---

<sup>1</sup>This system is currently under attack by the GSAS offices. They tried to restrict all grad students to no more than 12 credits in fall 2009, but pretty much every department filed strong objections. So just beware that this information is subject to change in the near future.

## 1.2 Teaching

Most grads are teaching assistants during their first two years. Everyone has a slightly different set of responsibilities. Make sure you keep up with them! This is your job; it's how you're getting paid. The Head TA will discuss the details about TA work. In particular, we'll emphasize here that you should endeavor to always be on time to your appointed duties — especially office hours and night lab-type work. It's an unfortunate fact that the faculty will often only notice the average TA's work if it is done poorly.

Except for ASTR 1230 TAs and the ASTR 2110/2120 TA, grading is not included in the TA duties. Graderships are done on a volunteer basis, and are paid hourly with a maximum number of hours per semester, usually around 40. The current rate is \$10.50 per hour, although that is expected to increase periodically. It's a relatively painless and mindless way to earn a few extra bucks. Someone will be in charge of organizing graders each semester and should make all grads aware of the opportunities. NOTE: Due to visa restrictions, international graduates students will need to see Barbara to find out *if* they can be graders.

*Useful Reminder:* If you are a TA, you get a discount 10% on textbooks at the University bookstore. Be sure to mention that you are a TA before your books get scanned at the checkout register.

## 1.3 Research

You should choose a research advisor by the end of the third week of classes, though it is common to start work earlier. You can go door-to-door if you want and ask each of them what they do. The faculty are generally pretty friendly and are more than happy to tell you about their work. If you want the inside scoop on what it's like to work with a particular person, ask one of their current research assistants about it. If the person you're considering has no current advisees, ask one of the more senior grads who might be able to relate stories of the experience of others.

Your research is important. Presumably, it's the main reason why you're here. Work hard on it, but not at the total expense of course work. The faculty will not be impressed if you do great research but fail your classes. In general, it should take you 1–2 years to finish a Master's level project. To get your M.S., you will need to either publish a paper on your work or write a good executive summary of what you've done. Either will be accepted by the grad advisor for the completion of your M.S. The sooner you finish this and move on to your dissertation research, the better.

When you're getting close to finishing your Master's project, start to think about what you might want to do for a Ph.D. Specifically, think about *who* you would want to work with. It's fairly common to switch advisors between the M.S and the Ph.D. If you think this will be best for you,

don't worry about it — most faculty accept this as routine and will not take it personally. As far as choosing a project goes, it's great if you can come up with a thesis of your own, but frequently your advisor will be able to suggest possible topics.

## 1.4 The (dreaded) Qualifier

In order to pass from the Master's program into the Ph.D program, all grads must first pass two qualifying exams: the Master's exam and the Ph.D exam. These exams are administered during one weekend each January. Most people find it necessary to study for an absolute minimum of two weeks prior to the exam, and frequently for longer. There's often a correlation between how long people spend studying for the exams and how well they do. You should think about starting to study around Christmas time. The exams are written and have a 4-hour time limit. All topics in astronomy are fair game, but in general, at least the Master's-level exam has traditionally been weighted toward topics covered in the astronomy courses from the previous semester. The Ph.D.-level exam is pretty much wide open.

After your first semester, you must take the Master's-level exam and may optionally take the Ph.D exam. You are expected to pass the Master's exam, but in reality it is unlikely that anyone will be asked to leave the program after this first try unless performance is *extremely* poor. Still, take it very, very seriously. Regardless of whether or not you pass the exam(s) your first year, you will have to take both exams again after your third semester. This time you are expected to pass both and to show improvement on your Master's-level exam. Scores of 70 and above are generally considered passing. Scores below 70 are considered by the faculty on a case-by-case basis to decide whether they are passing.

## 1.5 Miscellaneous

There are a few other responsibilities that all grads share which don't fit nicely into the four categories above. They are listed below, in random order.

- Colloquium “Privilege”: The department runs a weekly colloquium in the conference room on Mondays. At the beginning of each year, the grad rep (see Section 3) will make up a randomly ordered list of all the grads and post it on the grad bulletin board. This is the Colloquium “Privilege” list. Colloquium duty involves:<sup>2</sup>
  - Tidying up the conference room to make sure it is ready for the talk, including arranging the chairs nicely, pulling the screen down, turning on/off appropriate lights, erasing the chalkboard, and making sure the pointer is available.

---

<sup>2</sup>Colloquium is now held exclusively at NRAO, so this duty is deprecated....

- Seek out the speaker for the day to determine whether they have any special media needs (e.g. slide projector or connection for a PowerPoint presentation).
  - Make sure the audio system is ready and help the speaker with the microphone.
  - After the talk, make sure all media items are put away and secured.
- **Colloquia:** Between NRAO and UVa, there are usually two Astronomy colloquia every week in Charlottesville. In addition, there are less formal TUNA talks at NRAO. Grad students are expected to attend the majority of the colloquia. You should at least attend all of the UVa colloquia that you can, and as many NRAO colloquia as possible. The faculty will notice if attendance is consistently poor at colloquia, and have been known to put questions taken directly from colloquia on the qualifiers if attendance is bad. TUNA talks are viewed as more optional, but still very useful. At first, you will probably have a hard time following these various talks. This is normal. Don't get discouraged. Keep going, and over time, you will absorb more and more of the material covered.
  - **Public Night:** The first and third Friday of each month, there is a Public Night at McCormick Observatory, plus one Friday in October and one in April when the Fan Mountain Observatory is open to the public. In general, each grad student will have to work at one public night each semester. A schedule is created at the beginning of each semester, and you will be given the opportunity to request specific dates. The details about how public night works will be discussed elsewhere, probably in a meeting with Ed Murphy sometime early in the semester.
  - All grads are required to submit progress reports at the end of each semester. These should detail your research progress, committee work, conferences attended, papers published, and anything else of note. Copies should go to the Chair, Grad advisor, your research adviser, your mentor adviser (first- and second-years), and each member of your committee (third-years and beyond). Also, give one copy to Jackie so she can put it in your department file. The grad rep should remind people about these as each semester comes to a close. As an example, take a look at a senior grad's progress report from a previous semester.

## 2 Other Recommendations

There are numerous heretofore undocumented responsibilities, privileges, and nuggets of truth which have been passed down from grad student to grad student over the years. Unfortunately, some of it gets lost over time, sometimes with unpleasant consequences. This section is primarily a list of these things, in random order.

- It's a good idea to apply for outside funding. Even if your adviser has lots of grant money, it gives you some independence and looks great on your résumé if you've won grants of your own. Some examples of these are NSF fellowships (primarily for first- or second-year

grads, minorities or women), Sigma Xi Grants-in-Aid of Research (deadlines March 15 and October 15), NASA Graduate Student Research Program fellowships, and Virginia Space Grant Consortium grants. The grad rep should remind people of the deadlines for these.

- All grad students should have some practice giving talks beyond the safety of ASTR 8500. TUNA talks and the UVa Astro Symposium talks are good venues since they're still relatively small and familiar crowds and aren't full 1-hour colloquia. The UVa Astro Symposium is held at some time in February, while TUNA talks are held weekly.
- The first- and second-year students are responsible for organizing the spring and fall Fan Mountain picnics. They're usually held around the time of Fan Public Night, but the timing may vary based on weather. Organization of these should start in mid September for the fall picnic and in mid March for the spring picnic. The Head TA should be in charge, so talk to last year's Head TA about what needs to be done (beer, food, invitations, money, sports equipment, etc).
- We (the grad students) run a part of the web site called AQuA, for **A**stronomy **Q**uestion and **A**nswer. People can email questions about astronomy to us. It's run on a rotating basis, so it typically results in about 1 question per person every couple weeks. Of course, the more people who sign up, the less frequent the questions are for each person. We don't do people's homework for them, and submitters are warned that it may take a week or two to get an answer, so the pressure on you is somewhat lessened. AQuA service is not mandatory, but certainly appreciated. If you're willing to help out, contact the webmaster (currently ????).
- **Summer funding is not guaranteed.** Your adviser may be able to pay you, but it's also not a bad idea to teach at some point, particularly since most TAs don't get a chance to teach in a classroom setting. In March or April, Tolbert will distribute forms asking for volunteers to teach the summer classes. The classes taught are ASTR 1210, 1220, 3340, and 3480. If you're not going to teach, you should talk to your advisor at that point about your funding situation.
- Once the faculty have graded the qualifier exams, they have a big meeting to discuss the progress of every graduate student. Exam scores are discussed as well as performance in TA responsibilities, course work, and research. Because we've never been to one of these (obviously closed) meetings, it's not clear whether anything else is discussed. However, the prevailing feeling among many grads over the years has been that this is the critical meeting during which you want the faculty to think fondly about you. Basically, whether or not they are impressed with your work, it's going to be harder for them to dismiss you from the grad program if they have interacted with you on a personal level. It is therefore the advice of the authors that you make an attempt to participate in at least a few departmental social events. Most people really enjoy these events, so it's not at all a hardship to go. Still, even if you're not into the Astronomy social scene, consider attending some or all of the following events where you will be able to interact with the faculty informally:

- Department Social Events

1. Halloween party: There is a Halloween party at the end of October each year. The last couple of years, it's been held at the McCormick Observatory.
2. Holiday party: There is a holiday party at the end of the Fall semester each year. The last few years, the location has alternated between one of the Pavilions on the Lawn and the Boar's Head Inn, depending on whether NRAO or UVa is hosting.
3. Kovalenko dinner: This is a semi-formal dinner held each February in the Rotunda, paid for by the department.
4. Department picnics: Each Fall and Spring, we have a department picnic at Fan Mountain. People usually play softball, volleyball or throw a frisbee, and the weather is typically pretty nice. A designated grad student, affectionately known as the "picnic goat" gets to plan the event.

### 3 The Graduate Representative (Grad Rep)

A grad student should be elected/appointed/coerced each year to be the representative both of the department to the Graduate Student Council and the formal representative of the grad students to the faculty within the department. In the event that no person is willing to perform both of these functions simultaneously, the job can be split up to have one person be the Grad Student Council representative and one person be the department-only rep. Grad Student Council meetings are once a month. The current GSC president should be contacted when the rep changes. His or her name and email address should be on the GSC website at <http://www.student.virginia.edu/~gsasc/>.

Within the department, the grad rep should be a contact with faculty for non-TA related stuff, for example: buying furniture or anything else grads need, mediating disputes, etc. Students are of course free to take personal concerns directly to the faculty themselves, but the grad rep is available as a liaison if desired. For issues which concern the grads as a complete group, it is preferable to have one person represent everyone. It's probably best for this person to be someone in their third year or beyond — someone who has been around long enough to know how most things work in the department and with whom the faculty are already familiar.

In general, the grad rep should try to keep things running smoothly and make sure that his/her fellow students are aware of their responsibilities. Among other things, the grad rep should do the following:

- Coordinate with the graduate advisor and head TA to organize fall orientation schedule.
- Hold a meeting for all grads at the beginning of the Fall semester. This is primarily for the benefit of first-year students, so that they can be introduced and given an introduction to graduate life. Meeting topics typically include issues of seniority, traditions, administrative duties, and any other info for the common good.
- If needed, orchestrate office switching/furniture acquisition during the summer. Inform Jackie of any switching so she can update the department directory.
- Create and post the colloquium duty list. Possibly remind people when it's their turn, and instruct first-year students about the procedure.<sup>3</sup>
- Plan the Department Halloween party at McCormick Observatory.
- Coordinate with the graduate advisor and organize the UVa Astronomy Symposium at the beginning of the spring semester (1–2 weeks after the qualifier).
- Remind grads to write progress reports at the end of each semester.

---

<sup>3</sup>Deprecated. Will be removed in next edition most likely

- Keep track of funding opportunities and remind all grads when relevant deadlines approach (e.g. Sigma Xi grants).