CCUWiP Workshop:
Becoming a Grad Student

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STOP:

Do you really want/need to go to grad school?

Choosing a Grad School that Fits You

Program type

Masters or direct-entry PhD

→ American vs. Canadian vs. European

Combined Departments

→ e.g. Physics + Astronomy

→ Might have to take courses outside of area of interest

→ Be aware of different qualifying exams (e.g. Physics GRE)

Research

Theory or experimentation?

What sub-field are you interested in?

→ Read up on professors' interests

→ Also useful to read up on postdocs and their interests

Not sure?

→ Look for schools that specialize in many fields

Identify 2-3 faculty you could work with

Things to look out for

How intense is the program?

→ Is the master's program course-based or research-based?

→ How many courses are required?

→ Do you need to find a supervisor before you begin?

How long does it take to graduate?

→ Most are 5+ years

→ In Europe, a PhD takes about 3 years

Funding

Some websites provide stipend estimates based on previous year

→ Part is awarded for research

→ Part is income from TA work

Does the stipend match the cost of living?

→ Rent, utilities, food, transportation, etc.

→ Be mindful of any student loans you have

The majority of schools should pay for you to attend graduate school

Location

You will spend at least 3 years there!

North America or abroad?

Big city or small college town?

Warm place or cold place?

Political climate...

How many schools to consider

It's expensive to apply to grad school

→ Costs about $100 per application

Top- ranking schools may not be the best choice for your interests

Try applying to schools in a 2:3:2 ratio:

→ Safe schools

→ Moderate schools

→ Reach schools

APPLYING INTERNATIONALLY VS. DOMESTICALLY

You are most competitive when applying domestically

→ Many schools (especially public) are mandated / endorsed to support domestic students

→ International students have higher tuitions and reduced funding opportunities

Generic Differences Between Country Models

PhD Model	Canadian	American	European (+Many others)
Degree Requirements	Undergraduate	Undergraduate	Masters / Honours Undergraduate + Research Experience
Requires GRE	Less common	More common	No
Time to Completion	5-6 years	5-6 years	< 4 years
Normal Degrees Awarded	Masters & PhD	PhD	PhD
Coursework	1-2 years moderate coursework	1-2 years moderate coursework	Limited / no coursework
Teaching Responsibilities	Often part of funding package	Often part of funding package	Occasional / optional
Thesis Topic Choice	After 1-2 years	After 1-2 years	Immediate
Exams	Thesis and often general exam	Thesis and often general exam	Thesis exam

Applying to Grad School

Applying to Grad School

When?

→ Fall/Winter before you hope to attend

- Most applications are due December - January

Where?

→ Online, through the school's website

How?

→ ...

What goes into your application?

Application Fee

→ ~ $100 for North American schools, free for some European schools

Transcript

→ Most recent unofficial transcript

CV

→ Up-to-date record of your academic accomplishments

- Education, research + teaching experience, publications, conferences, scholarships, awards, volunteer experience. You're applying to a science-based graduate program, keep it relevant and concise!

What goes into your application?

Personal Statement

→ Conveys everything your CV couldn't -- in 1 page or less

- Let them know who you are, what you're interested in, why they're perfect for you, and why you're perfect for them

Letters of Recommendation

→ 2-3 letters written by academics of your choice

- Research supervisors, professors you've been a TA for, professors who know you well from a course

Read the application instructions!

Applying to International Schools

GRE Scores

→ General GRE and Physics Subject GRE are required for most American schools

- Will cost a few hundred dollars to take and send out scores
- https://docs.google.com/spreadsheets/u/1/d/19UhYToXOPZkZ3CM469ru3Uwk4584CmzZyAVVwQJJcyc/htmlview

TOEFL / IELTS Scores

→ Required if you're from a non-English speaking country

- Will cost a few hundred dollars to take and send out scores

Pro Tips

Contact Professors

→ Send an email to potential supervisors asking about possible research with them

- Might help them remember you if they're on the admissions committee

Make a Spreadsheet

→ Keep track of deadlines and your progress on each application

- You can share this with your letter writers, too

Ask current graduate students! We're happy to share our experiences

Hearing Back from Grad Schools

What will they say?

- → Rejected
  - It happens! Send a polite email thanking them for taking the time to read your application.
- → Interview
  - Schedule a Skype interview to ask you more questions (and allow you to ask questions, too)
- → Waitlisted
  - If other applicants decline their offers, you'll be offered a spot next
- → Accepted
  - Congratulations!

Deciding on a Grad School

Visiting Grad Schools

When?

→ February - early April

Why?

→ You'll get a better sense of the department, program, environment, etc., and be able to make a much more informed decision

- Also, IT'S FREE

Which ones?

→ All of the ones you're seriously considering attending, as long as you have time for it

Typical Visit Outline

Day 1

- → Introduction + program overview
- → Faculty research presentations
- → Lunch with people from department
- → One-on-one meetings with faculty
- → Campus tour
- → Dinner with people from department

Day 2

- → Grad student research presentations
- → One-on-one meetings with faculty
- → Lunch with people from department
- → Instrumentation lab tours
- → Opportunity to chat with grad students
- → Dinner + drinks with people from department

Asking Questions About the Program

→ Do you need to find a supervisor right away?

→ How many classes are required?

→ What is the qualifying exam like?

→ Is being a TA required?

→ What will your stipend be?

→ How long do most students take to graduate?

→ What do most graduates go into afterward?

Asking Questions of Potential Supervisors

→ What projects do they have in mind for new students?

→ What is their supervising style like?

→ How many students do they currently have?

→ Do they encourage their students to attend conferences, collaboration meetings, or professional development events?

→ You can also ask for their opinions of the program, department, university, and city.

Asking Questions of Grad Students -- Part I

→ Are they happy there?

→ What's the one thing they wish they had known before attending?

→ Is there a sense of community among the grad students/department in general?

→ What are the courses like?

→ What is their TA work like?

→ What is the qualifying exam like?

→ Are they happy with their supervisors?

Asking Questions of Grad Students -- Part II

→ What are their offices like?

→ Is their stipend sufficient given the cost of living?

→ What sort of housing options are available nearby and within their budget?

→ What sort of health coverage do they receive?

→ What sort of outreach are they involved in?

→ What is the climate in the department like?

→ Is the city nice to live in?

Deciding on a Grad School

Did you like the **program**?

→ Courses, qualifying exam, TA requirements, research expectations, etc.

Did you like the **professors**?

→ Multiple people you could see yourself working with

Did you like the **school**?

→ Stipend, healthcare, location, housing options, weather, activities

Did you like the **grad students**?

→ Happiness, friendliness, involvement, helpfulness, etc.

Skills to Have for Grad School

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Technical Skills

- → Programming
  - Python, IDL, C++, Fortran, LaTeX, etc.
- → Academic Skills
  - Reading papers, scientific writing, presentations, note-taking, emails, etc.

Social Skills

- → Communicating ideas
  - Voicing thoughts, asking questions, being engaged in discussions, teaching others
- → Networking
  - Chatting with people outside of your research bubble, involvement in outreach

Skills to Have for Grad School

Personal Skills

- → Self motivation
  - Keeping yourself on track, continual effort/desire to make progress
- → Time management
  - Scheduling, spending time wisely, identifying and preventing unproductive periods

Teaching Skills

- → Engaging the class
  - Keeping students interested and motivated, awareness of learning styles and levels of understanding
- → Marking efficiently
  - Marking quickly but fairly and consistently, noting common problem areas

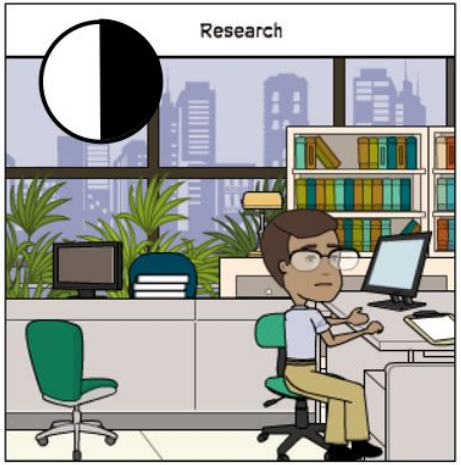
Life of a Grad Student

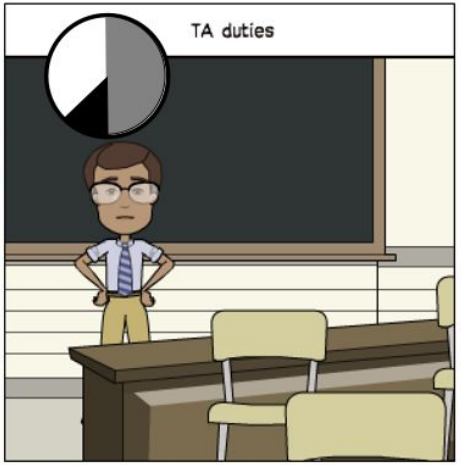
What to expect?

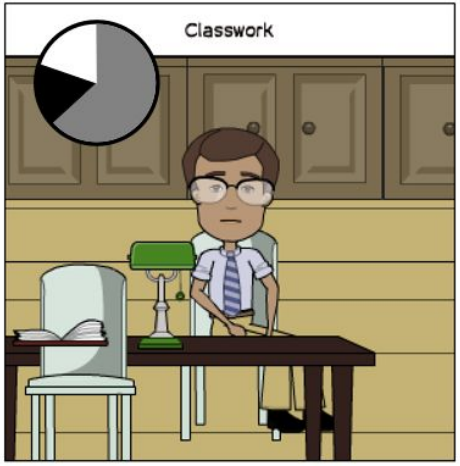
Be prepared to:

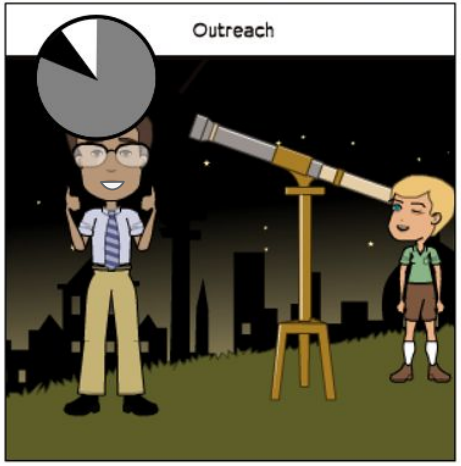
- → Attend lots of meetings
- → Work at weird hours
- → Debug code
- → Wait for code to finish running
- → Sudden deadlines
- → Juggling research, courses, and teaching

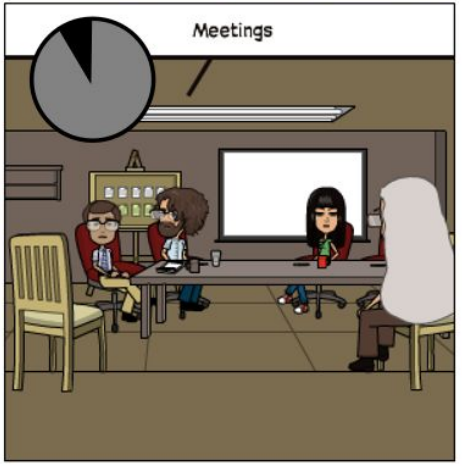
Day in the Life
of a
Grad Student



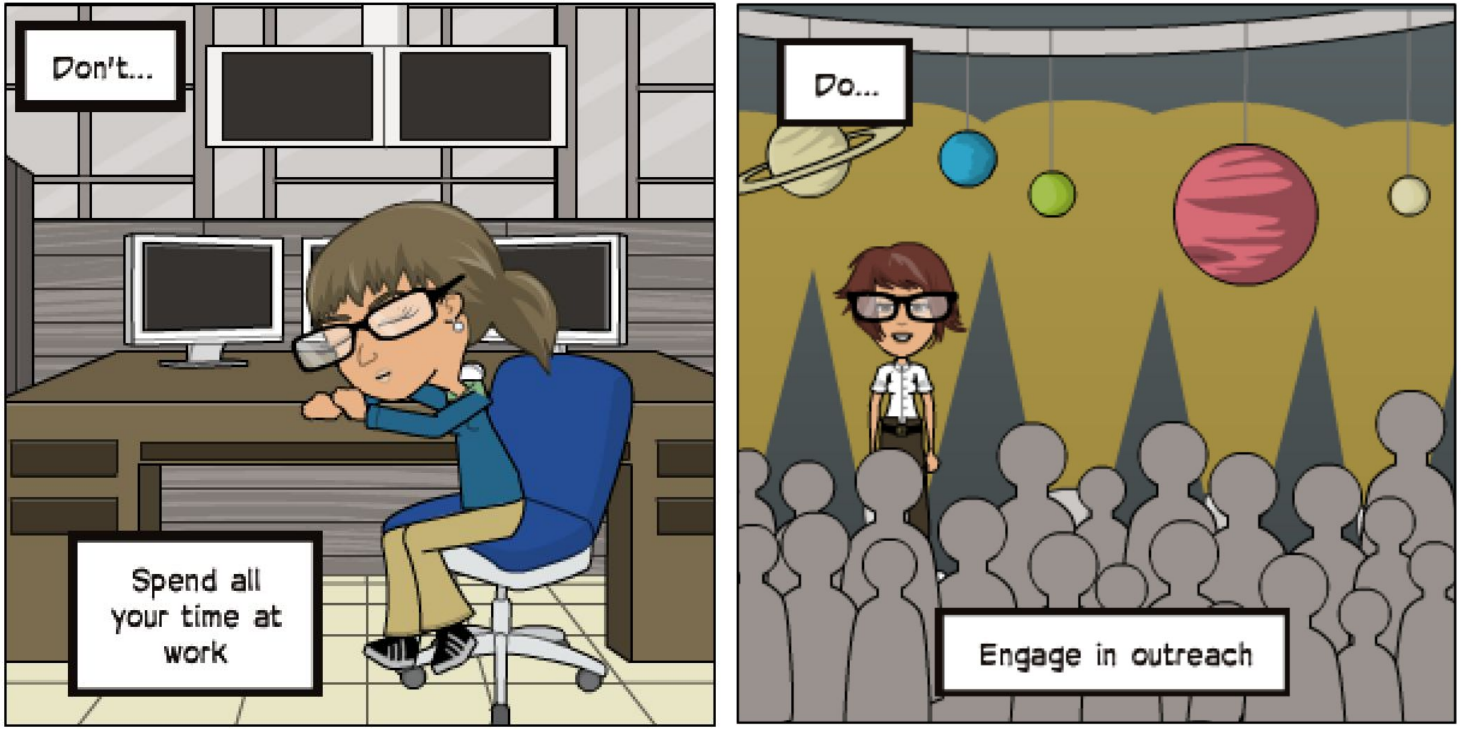








What to do?



What to do?


Don't...
Spend all your time at work
Do...
Socialize with your peers

Mental & Physical Health

Do stuff outside of astronomy!

- → Stay active
- → Get involved
- → Explore the city
- → Be aware of what resources are available to you

What can you do with a PhD in Astronomy or Physics?

Job Prospects

- Postdoc → professor
- Data analyst
- Jobs in machine learning
- Teacher
- Astronaut
- Outreach
- Software engineer
- Science communication
- Science Policy

Figure out what's best for you.

Grad School isn't the Only Option!


GRADUATE PROGRAMS
PERIMETER SCHOLARS INTERNATIONAL
perimeterscholars.org
McMaster University
Physics & Astronomy Graduate Program
Hamilton, Ontario
Come do research in:
ASTRONOMY
ASTROPHYSICS
ATOMIC PHYSICS
BIOPHYSICS
CONDENSED MATTER
COSMOLOGY
NUCLEAR PHYSICS
PARTICLE PHYSICS
QUANTUM OPTICS
SOFT MATTER
International Master Astronomy
Kapteyn Astronomical Institute
Groningen, The Netherlands
Astronomy at Steward Observatory
Graduate Studies in Physics and Astronomy
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Research Opportunities for Honours, Masters and PhD students
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Theoretical Astrophysics Santa Cruz
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UCSC DEPARTMENT OF ASTRONOMY & ASTROPHYSICS
Graduate Studies in Physics, Engineering Physics and Astronomy
www.physics.queensu.ca
Graduate Studies in Astrophysics at the University of Calgary
UNIVERSITY OF CALGARY
PhD in Astrophysics
Application due date is Nov. 15th
We form one of the largest centers of astrophysical research in the world
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University of Michigan Astronomy Graduate Program
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