#### Planning for Graduate School

#### Graduate Programs

- Master of Science (MS, MSc, MSci, ...)
  - Typically, 1-2 years
  - Combination of taught classes and research
  - Culminates in thesis
- Doctor of Philosophy (PhD)
  - Typically, 5-6 years (shorter if already have MS)
  - Initially taught classes, then mostly research
  - Culminates in thesis + defense

# Why get a MS/PhD?

- Pre-requisite for some future career paths
  - essential for further progress in academia
  - often a strong preference for research/technical jobs
- Stimulating and rewarding
  - get involved in research that's never been done before
  - use world-class research facilities (e.g., telescopes, satellites)
- But perhaps not, if...
  - …it's just the default option
  - …it's what your friends are doing
  - ...you don't like long hours and high stress

#### Academic Career Paths



#### **Typical PhD Experience: UW-Madison**

- Years 1-2: settling in
  - Graduate-level classes (physics/astronomy/computing/stats/...)
  - Small research projects
  - Prelim exams (written/oral)
- Years 3-4: starting your research
  - Choose thesis topic(s)
  - Present thesis proposal
  - ▶ 1-2 papers published
- Years 5-6: completing your research
  - ► 1-2 more papers
  - Write thesis
  - Defend thesis

# Funding in Grad School

#### Teaching Assistant (TA)

- Work with faculty on undergraduate classes
- Lead discussion sessions, grading, labs
- Looks good on CV
- But can distract from research
- Research Assistant (RA)
  - Working on one or more research projects
  - Projects may or may not overlap with thesis topic
- Graduate Fellow
  - Awarded by university or national agency (NASA, NSF)
  - Usually very competitive
  - Looks good on CV

# Applying to Grad School

- Academic transcript
  - Overall GPA
  - Grades in "important" subjects (astro/physics/math)
  - ► GRE scores (esp. verbal)
- Personal statement
  - Your background (brief)
  - Why grad school?
  - Why ACME University?
- Letters of Reference (3+)
  - Your academic abilities
  - Your aptitude for research

## Gaining Research Experience

- NSF's Research Experiences for Undergraduates (REU) program
  - undergraduates spend summer weeks/months at another school
  - work on research projects with faculty/grad students
  - REU advisors often provide letters of reference
  - open to US citizens
- Departmental opportunities
  - research groups often looking for undergraduate help
  - can lead to published research, trips to meetings, etc.

# Choosing Schools

- Do their research interests align with mine?
- Do they have the right resources (telescopes, computers, etc.)?
- Do I want to spend 5-6 years living here?
- Do I like the people (e.g., from AAS meeting experiences)?

#### Planning Your Personal Statement

Tailor to each school/department you're applying to

- Name specific research areas
- Name specific professors
- Mention resources you might use (e.g., telescopes)
- Explain your motivation
  - What got you interested in astronomy (but not too trite)?
  - Why do you want to do research?
  - How does a PhD from ACME University fit into your life goals?
- ▶ Talk about your research experiences so far (e.g., REU)
- Explain any anomalies in your transcript/GRE

## Choosing Letter Writers

#### Look for

- writers who know you personally
- writers who are known at ACME University
- writers who can talk about your research experience(s)
- writers who can provide a <u>strong</u> letter
- Give the writers
  - a copy of your personal statement
  - deadline dates (3+ days before actual deadline)
  - names, addresses
  - stamped, addressed envelopes (for hard-copy letters)
  - reminders as the deadline approaches

#### Timeline

- November:
  - Select schools
  - Choose letter writers
  - Draft statements
- December
  - Submit applications
- January
  - Attend winter AAS meeting
  - Receive offers
- Feb April
  - Visit schools
- April 15<sup>th</sup>
  - decision deadline
  - new offers