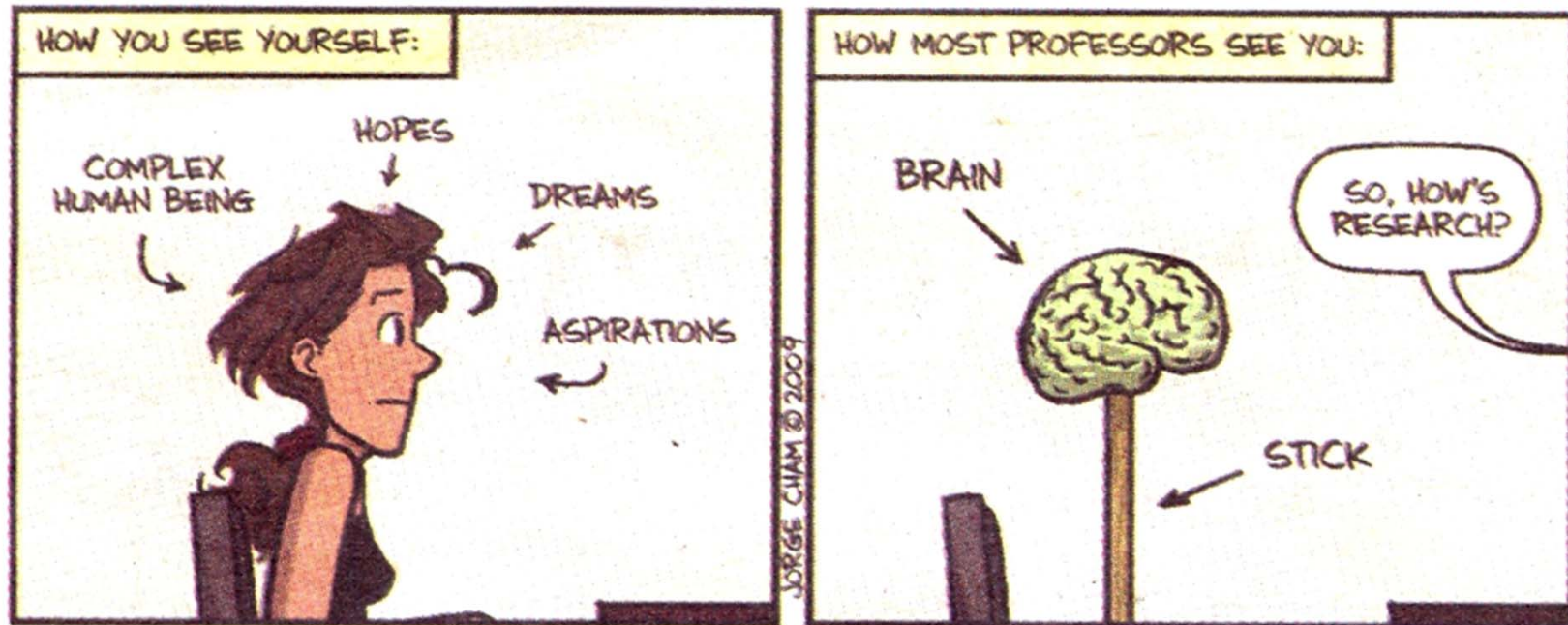
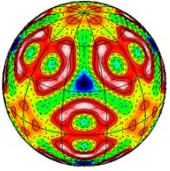


Tips for finding an advisor



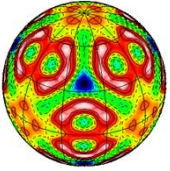


Finding an advisor



- **What does an advisor do?**
 - Guides your PhD research
 - Generally funds your research
 - Is the main editor of your PhD thesis
 - Helps you make contact with others in the scientific community
- **How many advisors are there at UIUC?**

Approx. 70-80 professors supervise students for physics PhD (not just in Physics!! ~10% of Physics grad students do research in other departments!)
- **How many students are there here?**
 - Approx. 270 students are seeking physics PhD (most advanced grad students already have advisors)



Key decisions you'll need to make



1. Do you want to be a theorist or an experimentalist?

To be happy and successful in a longish (~5-6 years) grad school career, you **MUST** get some enjoyment from the more mundane day-to-day activities associated with your research, **NOT** just the “big picture” goal of your research...

Theorists enjoy:

Analytical calculations

Mathematics

Developing models

Computers

Does a blackboard/notepad full of equations excite you?

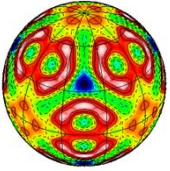
Experimentalists enjoy:

Equipment building and troubleshooting

Data Acquisition and Analysis

Computers

Does working with circuit boards, optical mounts, etc., excite you?



Key decisions you'll need to make



1. Do you want to be a theorist or an experimentalist?

Are you interested in elements of both experiment and theory?

“Computational” Physicists enjoy:

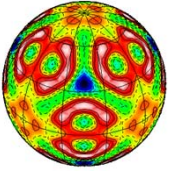
Mathematics

Developing and testing models

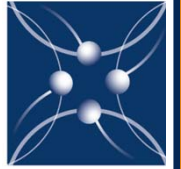
Programming and troubleshooting code

Computers

Does writing and troubleshooting code
excite you?

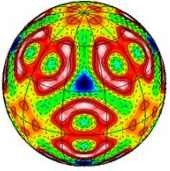


What Do Students Do at Illinois?



- About 35% of students do theory, 65% do experiment
- Of the students who change (theory to experiment) or (experiment to theory), most started in theory and change to experiment

If you want have elements of both theory and experiment in your research, generally speaking, it's probably a little easier to do theory as an experimentalist than to do experiments as a theorist (try computational physics if you like programming!).



Key decisions you'll need to make



2. What area of research interests you?

Astrophysics - Physical processes of planets, stars, galaxies,...

Atomic and Molecular Physics - Physics of atomic or molecular systems

Biophysics - Physical processes of biological molecules

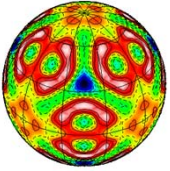
Condensed Matter - Physics of materials, solid phases of matter

Nuclear/Medium Energy Physics - Physics of atomic nucleus, muons, protons, neutrons, other particles

Particle/High Energy Physics - Study fundamental constituents of matter

Physics Education Research - Study how we learn science concepts

Quantum Information - Study/Exploitation of quantum 'weirdness'

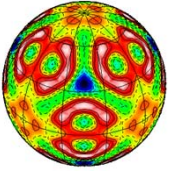


Key decisions you'll need to make



3. What *style* of research/advisor interests you?

- Large collaborative project vs. Small individual project
(high energy/nuclear vs. condensed matter/biophysics)
- Pure subfield vs Interdisciplinary research
- “Hands on” advisor vs. “Hands off” advisor
- New project/lab vs Established project/lab



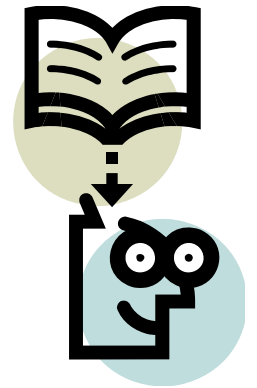
How can you tell what research you like?

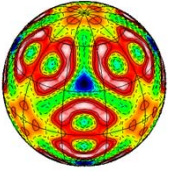


- You just know
- Based upon classes you liked best or did well in
- From undergraduate research projects you liked or didn't like
- By seminars you see that inspired you (or didn't!)

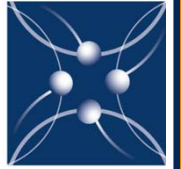
Take advantage of this first semester/year to identify research areas that interest you:

- Attend seminars/colloquia:
<http://physics.illinois.edu/events/seminar-listing.asp>
- Explore the research websites:
<http://physics.illinois.edu/research/>
- Talk with faculty: <http://physics.illinois.edu/people/>
- Look for grad blog research postings:
<http://physics.illinois.edu/grad/posts.asp>



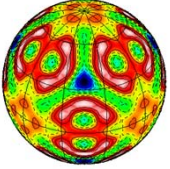


What advisors are looking for

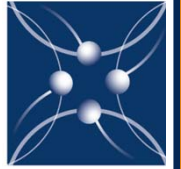


Experimental advisors:

- Most experimental advisors would like, but don't require, laboratory experience...i.e., they will generally train you
- Those building a new lab may want more experimental background in a new student
- Less grade conscious, in general
- Less concerned with which courses you've taken, e.g., the Biophysicists/Condensed Matter/AMO experimentalists will accept you in their groups even if you have no Biology/Condensed Matter/AMO experience
- Will generally start you in the group with intro projects

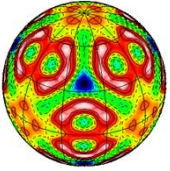


What advisors are looking for



Theory advisors:

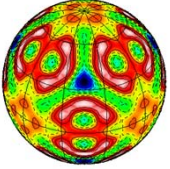
- Theory advisors are generally more grade-conscious, more likely to check qual results
- May want you to have more advanced courses (e.g., **quantum field theory**, etc.) before taking you as a student
- Generally want a strong math background
- Will generally evaluate you with “starter” problems before accepting you into the group



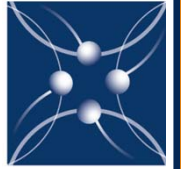
Some Tips



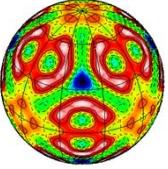
- Don't be too "calculating" about your decision: **research can be hard sometimes, so find something that excites/inspires you!!**
- Don't forget about opportunities outside the physics department (**Materials Science, Chemistry, Electrical Engineering, etc.**)
- Explore a little...don't assume you're sure you know what you want to do: **keep an open mind as you're watching the different research presentations in Phys 596**
- Don't assume a faculty member isn't looking for students if he/she doesn't give a 596 talk!
- Your quality of life has a definite impact on the quality of research you can do, so find an advisor and group environment you are comfortable with



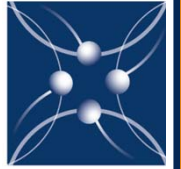
Goals and Time frames



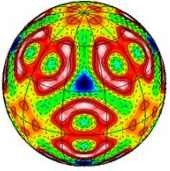
- **Goal:** start with an independent study with an advisor (Physics 597)
- **Time frames:**
 - Hang around the lab/group by Fall 2013 or Spring 2014
 - Try to start formally with a group by no later than Summer 2014



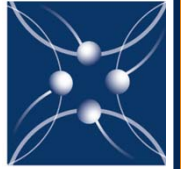
How to find an advisor



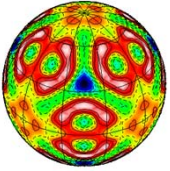
- Identify potential advisors
 - Look over their research pages on <http://physics.illinois.edu/research/>
 - Go to their seminars
 - Send them an e-mail to ask if you can meet to talk about their research
 - Talk with grad students of potential advisors to find out about style of research and group environment



Questions to ask a potential advisor



- Is he/she taking students? If “no”, then when will they take on students?
- Are the advisor’s research projects collaborative (multiple students), or does every student have his/her own project?
- Will you be expected to build a new apparatus (or write new code, perform a new calculation, etc.), or will you be jumping into the middle of a well-developed project that follows up another student’s research?
- Is it likely you’ll be constantly funded during your time with the group, or will you be expected to TA periodically?



How to find an advisor



- Once you've identified an advisor you're interested in, get your foot in the door
 - Ask about attending group meetings
 - Ask about getting involved with small projects, even if you're not funded
 - Start early (this semester, if possible, or next semester at the latest!)
 - There is no commitment (on either side) for you to stay with a group!

Research opportunities generally don't come to you...you need to be proactive and track down opportunities. Start early and get over any shyness!