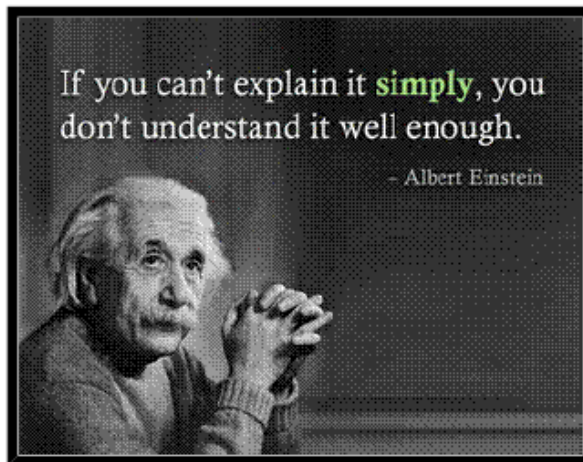


Physics 596 Course Introduction, Fall '14



Physics 596

Graduate Physics Orientation Fall 2014

The whole of science is nothing more than a refinement of everyday thinking.

—Albert Einstein, *Physics and Reality*, 1936

Home

Course Info

Syllabus

Assignments

Resources

Course Instructors:

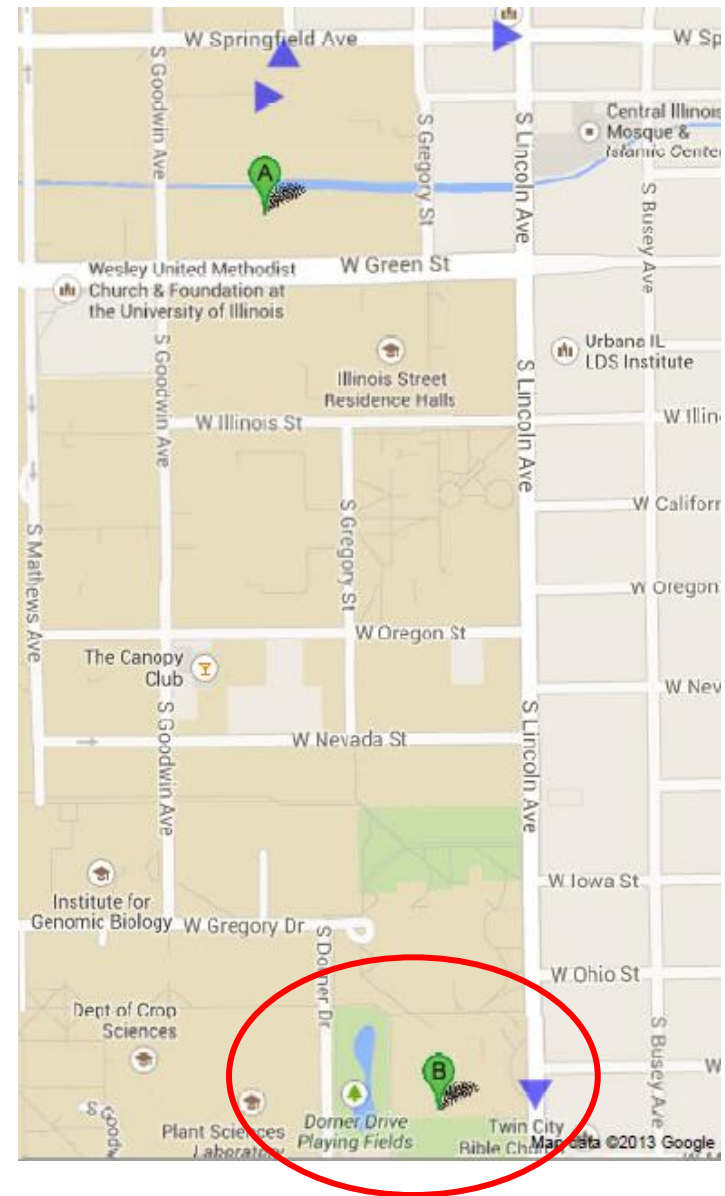
Lance Cooper: 218 MRL, 333-2589 (research)
227B Loomis, 333-8702 (departmental)

Celia Elliott: 218 MRL, 215 Loomis, 244-7725 (departmental)

Course Webpage: <http://courses.physics.illinois.edu/phys596/>

Upcoming Events

- Departmental Picnic
 - Saturday, September 6, 4-7 PM, Illini Grove



Our goals for you in Phys 596

Introduce you to research opportunities in Physics, etc.

Help you connect with a research advisor!

Help you learn methods to write and speak persuasively

The scientific community tends to be skeptical, so your scientific writing and presentations must be convincing!

Help you learn to navigate the scientific literature

Researching existing literature is critical for planning future work, writing proposals, writing papers, etc.

Help you learn to work in and lead a team

Collaboration is key in science

Provide insights into how the “world of science” works

e.g., how publication process works, what happens at scientific conferences, how to find advisors, how to write and research scientific papers/presentations, etc.

⇒ Help you transition from undergraduate to graduate ‘mindset’

Elements of Phys 596

1. Help finding a research group

- Faculty research presentations throughout the semester

Scheduled so far:

AMO/Quantum Information: **Bryce Gadway**

Astrophysics: Joaquin Vieira

Biological physics: Aleksei Aksimentiev, Tom Kuhlman, Ting Lu, Klaus Schulten, Paul Selvin, Jun Song

Condensed matter experiment: Peter Abbamonte, Laura Greene, Cecelia Leal, **Vidya Madhavan**

Condensed matter computation/theory: Tony Leggett, Lucas Wagner

Chemical physics theory: Alfred Hubler

High energy: **Ben Hooberman, Verena Martinez Outschoorn**, Kevin Pitts

Medium energy: Matthias Perdekamp, **Anne Sickles**, Liang Yang

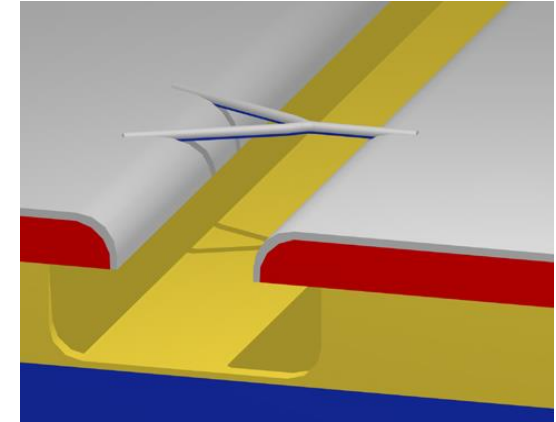
Elements of Phys 596

2. Skills essential to researchers

Writing/Presentation Skills

How to create and present journal club and research talks

How to write persuasive scientific papers



Scientific Scholarship

How to use on-line databases useful for research

Learning how to do what scientists do

Learning to write referee reports

Learning how the publication process works

*Scientific Ethics

Discuss real life case studies

*Required by OVCR & NSF

Elements of Phys 596

3. Instruction and practice giving scientific presentations and writing scientific papers

- Create and present a journal club talk
- Write a referee report on your journal club paper
- We'll talk about how to design a scientific poster
- Give effective scientific presentations
- Write effective scientific papers and abstracts

Why is Persuasive Writing and Speaking Important in Science?

It's not just all about good data/calculations: you will be judged as much for the quality of your thinking and presentation as for the quality of your results

It will be particularly important for you to communicate your results to non-experts

- prelims and dissertation defenses
- proposals
- colloquia
- public lectures

⇒ we'll emphasize this in this class

Elements of Phys 596

4. Practice in collaboration: working in teams

TEAM	Student
TEAM 1	An, Fangzhao
	Bai, Yang
	Balakrishnan, Srivatsan
TEAM 2	Birnbaum, Reuven
	Chen, Guannan
	Chen, Wei
TEAM 3	Claes, Jahan
	Finnegan, Alex
	Gill, Stephen
TEAM 4	Husain, Ali
	Iyer Anantha Krishnan, Ashwathi
	Kim, Ji Young
TEAM 5	Kononov, Alina
	Lee, Sangjun
	Lin, Mao

TEAM 6	Meier, Eric
	Nall, Duncan
	Osherson, Benjamin
TEAM 7	Padavic, Karmela
	Padhi, Bikash
	Puri, Akshat
TEAM 8	Song, Xiangyu
	Sun, Xiaolan
	Suresh, Babu, Soorya
TEAM 9	Victoria, Michelle
	Wadleigh, Laura
	Wang, Tong
	Yang, Yubo

<https://courses.physics.illinois.edu/phys596/fa2014/courseinfo.html>

Grading Policy

- Complete the assignments
- You'll critique each other's work. Your work won't be graded so much on content as on the fact that it has been completed conscientiously!
- Attendance is required!!

Don't worry about your grade in this class!!

⇒ You'll do well if you complete the assignments

⇒ The skills you develop will be far more important than the grade you get here!!

Our agenda

Physics 596 - Course Syllabus - Fall 2014

(Syllabus is subject to change!)

Week	Date	Topics	Lectures	Assignments	Reading
1	Aug 29	Introduction and course expectations How to find an advisor Creating/giving a journal club presentation	slides slides slides	Major Group Assignment Create and present a group Journal Club PowerPoint talk + individual referee reports	
2	Sep 5	Research in Experimental Intermediate Energy Physics - Prof. Anne Sickles Research in Computational Biological Physics - Prof. Alek Aksimentiev Tips for reading a scientific paper Publication process; How to write a referee report	slides slides		

<https://courses.physics.illinois.edu/phys596/fa2014/syllabus.htm>

Our agenda (cont.)

3	Sep 12	<p>Research in Experimental Biological Physics - Prof. Paul Selvin</p> <p>How to use on-line scientific resources</p> <p>On-line research with SCOPUS</p>	<p>slides</p> <p>slides</p>	<p>mini-Assignment #1</p> <p>On-line resource activities</p>	<p>Resource Activities</p> <p>Prof. Casey Miller's (U. South Florida) advice on using scientific resources</p>
4	Sep 19	<p>Research in Experimental Atomic, Molecular, and Optical Physics - Prof. Bryce Gadway</p> <p>Research in Experimental Condensed Matter Physics - Prof. Peter Abbamonte</p> <p>Research in Experimental Intermediate Energy Physics - Prof. Liang Yang</p>			
5	Sep 26	<p>Research in Experimental Condensed Matter Physics - Prof. Vidya Madhavan</p> <p>How to write a scientific abstract</p>	<p>slides</p>	<p>mini-Assignment #2</p> <p>Write an abstract for selected paper</p>	<p>Abstract Papers</p>

Our agenda (cont.)

6	Oct 3	<p>Research in Experimental High Energy Physics - Prof. Verena Martinez Outschoorn</p> <p>Research in Experimental High Energy Physics - Prof. Benjamin Hooberman</p> <p>Research in Experimental Condensed Matter Physics - Prof. Laura Greene</p>			
7	Oct 10	<p>Research in Computational Biological Physics - Prof. Jun Song</p> <p>Research in Observational Cosmology - Prof. Joaquin Vieira</p> <p>Research in Cross-Cutting Physics - Prof. Alfred Hubler</p>			
8	Oct 17	<p>Ethics in research</p>	<p>slides</p>		<p>Ethics Case Studies</p>
9	Oct 24	<p>Research in Computational Biological Physics - Prof. Klaus Schulten</p> <p>Research in Systems Biology - Prof. Thomas Kuhlman</p> <p>Giving effective scientific presentations</p>	<p>slides</p>		

Our agenda (cont.)

10	Oct. 31	<p>Research in Experimental High Energy Physics - Prof. Kevin Pitts</p> <p>Research in Computational Condensed Matter Physics - Prof. Lucas Wagner</p>			
11	Nov 7	<p>Research in Experimental Intermediate Energy Physics - Prof. Matthias Grosse Perdekamp</p> <p>Research in Experimental Condensed Matter Physics - Prof. Cecelia Leal</p>			
12	Nov 14	<p>Research in Theoretical Condensed Matter Physics - Prof. Tony Leggett</p> <p>Research in Biological Physics - Prof. Ting Lu (Bioengineering)</p> <p>Effective scientific posters</p>	slides		Scientific Poster Example/Template
13	Nov 21	Journal club presentations:			
	Nov 28	THANKSGIVING BREAK			
14	Dec 5	Journal club presentations:			