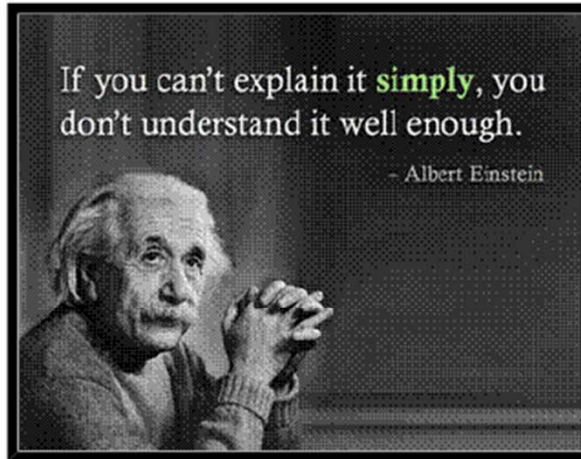
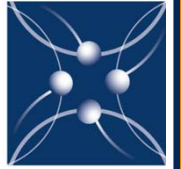


# Physics 596 Course Introduction, Fall '11



## Physics 596

### Graduate Physics Orientation Fall 2012

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

—Albert Einstein, *Physics and Reality*, 1936

Home

Course Info

Syllabus

Assignments

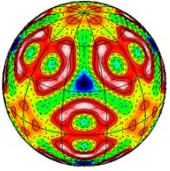
Resources

## Course Instructor:

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

## Course webpage:

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



# 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**

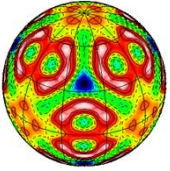
Researching existing literature is critical for planning future work, writing proposals, writing papers, etc.

**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.



# Elements of Phys 596



## 1. Help finding a research group

- Faculty research presentations throughout the semester

Scheduled so far:

**Astrophysics theory:** Telemachos Mouschovias

**Biological physics:** Aleksei Aksimentiev, Thomas Kuhlman, Klaus Schulten, Zan Schulten

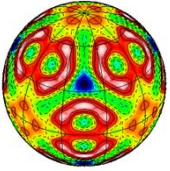
**Condensed matter experiment:** Steve Granick, Greg MacDougall

**Condensed matter theory:** David Ceperley/Lucas Wagner

**Cosmology experiment:** Jon Thaler

**High energy:** Tony Liss, Kevin Pitts

**Medium energy:** Liang Yang



# Elements of Phys 596

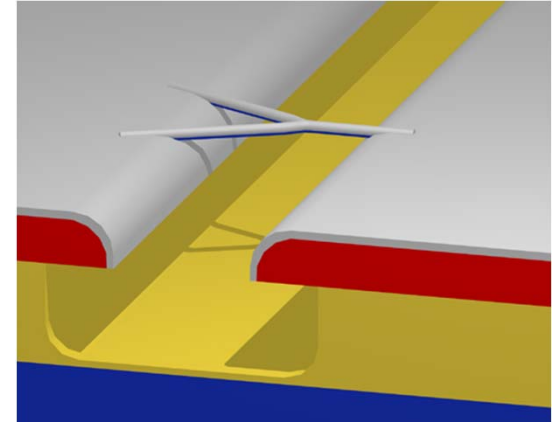


## 2. Skills essential to researchers

### 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

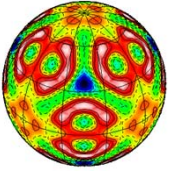
### Learning how to do what scientists do

Learning to write referee reports

Learning how the publication process works

### Scientific Ethics

Discuss real life case studies



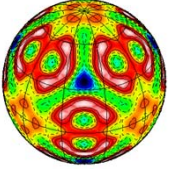
# Elements of Phys 596



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

- Create and present a journal club talk
  - You will also write a referee report on your paper
- Design a scientific poster
  - Present in virtual “poster session”





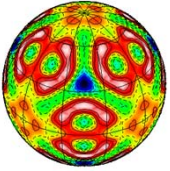
# Why is Persuasive Writing and Speaking Important in Science?



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**

Scientists in general, *but physicists in particular*, are naturally skeptical  $\Rightarrow$  **your results and ideas will not often be received without resistance**

**Persuasive writing and presentations should be logically structured and thoroughly supported with evidence**  
 $\Rightarrow$  **we'll discuss how to do this in this class**



# Elements of Phys 596

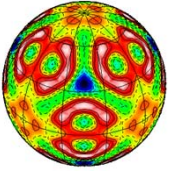


## 4. Practice in collaboration: learning to work in teams

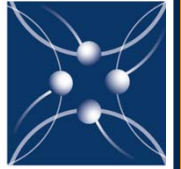
TEAM	Student
TEAM 1	Anastopoulos, Angelos Ascencio, Cesar Banerjee, Proгна Barragan, Angela
TEAM 2	Chen, Angela Chen, Li Coleman, John Decker, Karl
TEAM 3	Dove, Jason Fang, Xinyue Ferrante, Andrew Fliss, Jackson
TEAM 4	Gilbert, Ian Gloude-mans, James Hart, Gregory Hegde, Suraj
TEAM 5	Heitz, Robert Hill, Alexander Hu, Yichen Kuchibhotla, Adithya
TEAM 6	Lam, Kin Lapa, Matthew Limtragool, Kridsanaphong Mansbach, Rachael

TEAM 7	McFaul, Louis Meldgin, David Morong, William Park, Moon Jip
TEAM 8	Prasad, Shivangi Reig-i-Plessis, Dalmau Roeinpeikar, Seyed Mohammed Salazar-Lazaro, Carlos
TEAM 9	Shang, Ruo-yu Sherer, Nicholas Sun, Fei Thurston, Bryce
TEAM 10	Tsai, Pei-Wen Wolin, Brian Yeh, Tsung-Han Yu, Xiongjie
TEAM 11	Zakjevskii, Alexandre Zhou, Tianci Zhuang, Ye

<http://courses.physic.illinois.edu/phys596/courseinfo.html>



# Grading Policy



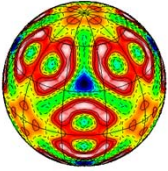
- Complete the assignments
- You'll critique each other's work. Your work won't be graded so much on content as on the fact that it has been completed *conscientiously!*
- Attendance is required!!

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 grades you get here!!





# Our agenda

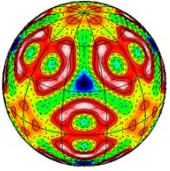


## Physics 596 - Course Syllabus - Fall 2012

(Syllabus is subject to change!)

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

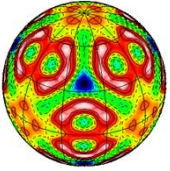
Week	Date	Topics	Lectures	Assignments	Reading
1	Aug 31	<b>Introduction and course expectations</b> <b>How to find an advisor</b> <b>Importance of persuasive writing and outlines</b> <b>Writing incrementally</b> <b>Fellowship info</b> <b>Fellowship links</b>	<a href="#">slides</a> <a href="#">slides</a> <a href="#">slides</a> <a href="#">slides</a> <a href="#">slides</a> <a href="#">slides</a>		
2	Sep 7	<b>Research in Experimental Biological Physics - Thomas Kuhlman</b> <b>Creating/giving a journal club presentation</b> <b>Publication process; How to write a referee report</b>	<a href="#">slides</a> <a href="#">slides</a>	<a href="#">Group Assignment #1</a> Create and present a group Journal Club PowerPoint talk + individual referee reports <a href="#">mini-Assignment #1</a> On-line resource activities (due...)	<a href="#">Resource Activities</a>



# Our agenda (cont.)



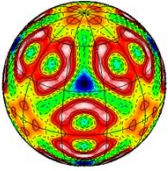
3	Sep 14	<p><b>Research in Theoretical Astrophysics - Telemachos Mouschovias</b></p> <p><b>How to use on-line scientific resources</b></p> <p><b>On-line research with SCOPUS</b></p> <p><b>How to write an abstract</b></p>	<p><a href="#">slides</a></p> <p><a href="#">slides</a></p> <p><a href="#">slides</a></p>	<p><a href="#">mini-Assignment #2</a></p> <p>Write an abstract for selected paper (due...)</p>	<p><a href="#">Abstract Papers</a></p>
4	Sep 21	<p><b>Research in High Energy Physics - Kevin Pitts</b></p> <p><b>Public Engagement and Outreach (Kevin Pitts)</b></p>			
5	Sep 28	<p><b>Research in Computational Biological Physics - Zaida Anne Luthey-Schulten</b></p> <p><b>Scientific Figures</b></p> <p><b>How to write a figure caption</b></p>	<p><a href="#">slides</a></p> <p><a href="#">slides</a></p>		



# Our agenda (cont.)



6	Oct 5	<b>Research in Experimental Cosmology - Jon Thaler</b>  <b>Giving an effective scientific presentation</b>	<a href="#">slides</a>		
7	Oct 12	<b>Ethics in research</b>  <b>Ethics case studies</b>	<a href="#">slides</a>  <a href="#">slides</a>		
8	Oct 19	<b>Research in High Energy Physics - Tony Liss</b>  <b>Research in Nuclear Physics - Liang Yang</b>			
9	Oct 26	<b>Research in Theoretical Biological Physics - Alek Aksimentiev</b>  <b>Research in Computational Condensed Matter - David Ceperley and Lucas Wagner</b>			



# Our agenda (cont.)



10	Nov 2	<p>Research in Experimental Condensed Matter Physics - Greg MacDougall</p> <p>Journal club presentations Teams xxxx</p>		<p><a href="#">Group Assignment #2</a> Develop a web- based research highlight <b>OR</b> a scientific poster for your research project</p>	
11	Nov 9	<p>Journal club presentations (cont.) Teams xxxx</p>			
12	Nov 16	<p>Research in Computational Biological Physics - Klaus Schulten</p> <p>Creating a scientific poster</p>	<p><a href="#">slides</a> <a href="#">Scientific Poster Example/Template</a></p>		
	Nov 23	<p>THANKSGIVING BREAK</p>			
13	Nov 30	<p>Research Talk - Research Talk - Research Talk -</p>			
14	Dec 7	<p>Scientific poster session</p>			