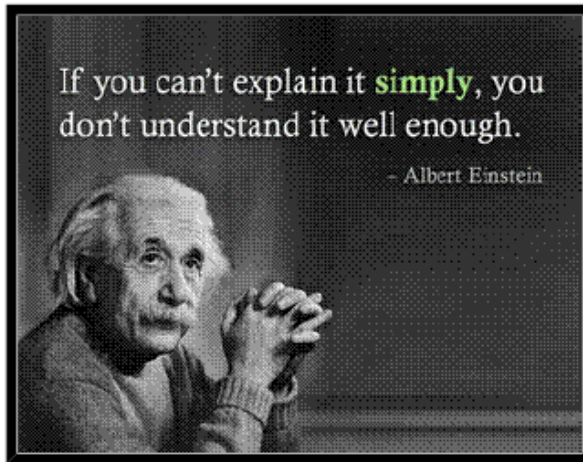


# Physics 596 Course Introduction, Fall '17

---



## Physics 596

### Graduate Physics Orientation Fall 2017

*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:** 215 Loomis, 244-7725 (departmental)

**Course Webpage:** <https://courses.physics.illinois.edu/phys596/fa2017/index.html>

# Our goals for you in Phys 596

---

Introduce you to research opportunities in Physics, etc.

Help you connect with a research advisor (about 70% of course)

Help you improve your abilities in scientific communication

Methods for making your scientific writing and presentations more persuasive

Teach you how to navigate the scientific literature

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

Gain practice working in and leading a team

Collaboration is key in science

Provide details 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:** Jeff Filippini, Charles Gammie, Joaquin Vieira

**AMO/Quantum Information:** Bryce Gadway

**Biological physics:** Aleksei Aksimentiev, Yann Chemla, Gabriel Juarez, Ting Lu, Jun Song

**Condensed matter experiment:** Tai Chiang, Nadya Mason, Renske van der Veen

**Condensed matter computation/theory:** Taylor Hughes

**High energy:** Aida El Khadra, Kevin Pitts, Jessie Shelton

**Intermediate energy:** Liang Yang

# Elements of Phys 596

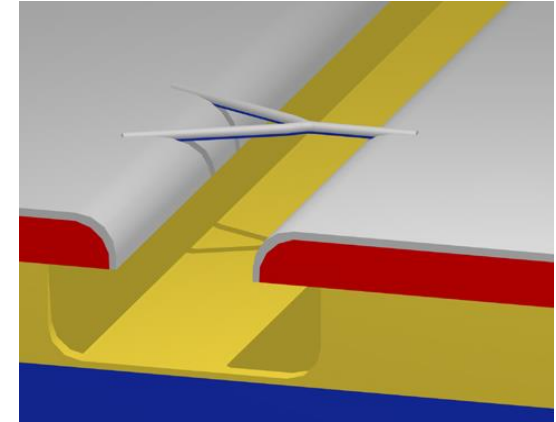
---

## 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

\*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
- 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
1	Abboud, Nicholas Aishwarya, Anuva Allen, James Buncher, Brandon Wang, Yunkai
2	Chaffee, Dalton Chen, Jin Chen, Yidong De Jesus Astacio, Luis
3	Ding, Yu Echevers, Jonathan Engblom, Samuel Fan, Cunwei
4	Gupta, Udit Hamilton, Gregory Hickl, Vincent Highman, Michael Zhang, Yujie
5	Hirsbrunner, Mark Jia, Weizhen Johnson, Spencer Khan, Syed Abid
6	Kim, Somang Krongchon, Kittithat Lahert, Shaun Leistico, Jacob Zhao, Mengdi

7	Lennox, Amber Li, Pin-Yi Li, Yao Lualdi, Colin
8	Ly, Kevin Ma, Yutao May-Mann, Julian Nie, Rong
9	Oolman, Kathleen Pai, Pin-Chun Paladugu, Sai Naga Manoj Ralegankar, Pranjal Romero Hernandez, Anabel
10	Rao, Pranav Robbins, Marc Rosales, Marcus Rosofsky, Shawn Zhu, Minhui
11	Sainers, Tyler Sarkar, Preetha Shafer, Devyn Shen, Jiayu
12	Shimek, Taylor Shinbrough, Kai Strekha, Benjamin Wang, Xueying Zhu, Penghao

[https://courses.physic  
s.illinois.edu/phys596/f  
a2017/courseinfo.html](https://courses.physic.s.illinois.edu/phys596/fa2017/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 2017

(Syllabus is subject to change!)

Week	Date	Topics	Lectures	Assignments	Reading
1	Sep 1	<b>Introduction and course expectations</b>  <b>How to find an advisor</b>	<a href="#">slides</a>  <a href="#">slides</a>	<a href="#">Major Group Assignment</a> Create and present a group Journal Club PowerPoint talk + individual referee reports	
2	Sep 8	<b>Research in Computational/Theoretical Biological Physics - <a href="#">Prof. Jun Song</a></b>  <b>Creating/giving a journal club presentation</b>	<a href="#">slides</a>		

<https://courses.physics.illinois.edu/phys596/fa2017/syllabus.htm>

# Our agenda (cont.)

3	Sep 15	<p><b>Research in Theoretical Condensed Matter Physics - <a href="#">Prof. Taylor Hughes</a></b></p> <p><b>How to use on-line scientific resources</b></p> <p><b>On-line research with SCOPUS</b></p>	<p><a href="#">slides</a></p> <p><a href="#">slides</a></p>	<p><a href="#">mini-Assignment #1</a></p> <p>On-line resource activities</p>	<p><a href="#">Resource Activities</a></p> <p><a href="#">Prof. Casey Miller's (U. South Florida) advice on using scientific resources</a></p>
4	Sep 22	<p><b>Research in Experimental Condensed Matter Physics - <a href="#">Prof. Nadya Mason</a></b></p> <p><b>Research in Experimental AMO and Quantum Physics - <a href="#">Prof. Bryce Gadway</a></b></p> <p><b>Publication process; How to write a referee report</b></p>	<p><a href="#">slides</a></p>		
5	Sep 29	<p><b>Research in Observational Cosmology - <a href="#">Prof. Jeff Filippini</a></b></p> <p><b>Research in Computational Biophysics - <a href="#">Prof. Aleksei Aksimentiev</a></b></p> <p><b>How to write a scientific abstract</b></p>	<p><a href="#">slides</a></p>	<p><a href="#">mini-Assignment #2</a></p> <p>Write an abstract for selected paper</p>	<p><a href="#">Abstract Papers</a></p>

# Our agenda (cont.)

6	Oct 6	<p>Research in Ultrafast Spectroscopy and Microscopy of Materials - <a href="#">Prof. Renske van der Veen</a></p> <p>Research in Theoretical High Energy Physics - <a href="#">Prof. Aida El Khadra</a></p> <p>Research in Theoretical High Energy Physics - <a href="#">Prof. Jessie Shelton</a></p>			
7	Oct 13	<p>Research in Experimental Condensed Matter Physics - <a href="#">Prof. Tai Chiang</a></p> <p>Research in Observational Cosmology - <a href="#">Prof. Joaquin Vieira</a></p> <p><b>Template for a journal club presentation</b></p>	<a href="#">slides</a>		
8	Oct 20	<b>Ethics in research</b>	<a href="#">slides</a>		<a href="#">Ethics Case Studies</a>
9	Oct 27	<p>Research in Theoretical Astrophysics - <a href="#">Prof. Charles Gammie</a></p> <p>Research in Neutrino Physics - <a href="#">Prof. Liang Yang</a></p>			

# Our agenda (cont.)

10	Nov 3	<a href="#">Research in Biological Physics at the Center for the Physics of Living Cells</a> - <a href="#">Prof. Yann Chemla</a>  <a href="#">Research in Experimental Biological Physics</a> - <a href="#">Prof. Gabriel Juarez</a>			
11	Nov 10	Research Talk -  Research Talk -			
12	Nov 17	<a href="#">Research in Computational Biological Physics</a> - <a href="#">Prof. Ting Lu</a>  <a href="#">Research in Experimental High Energy Physics</a> - <a href="#">Prof. Kevin Pitts</a>	<a href="#">Scientific Poster Example/Template</a>		
	Nov 24	<b>Thanksgiving Break</b>			
13	Dec 1	<b>Journal club presentations:</b>			
14	Dec 8	<b>Journal club presentations:</b>			