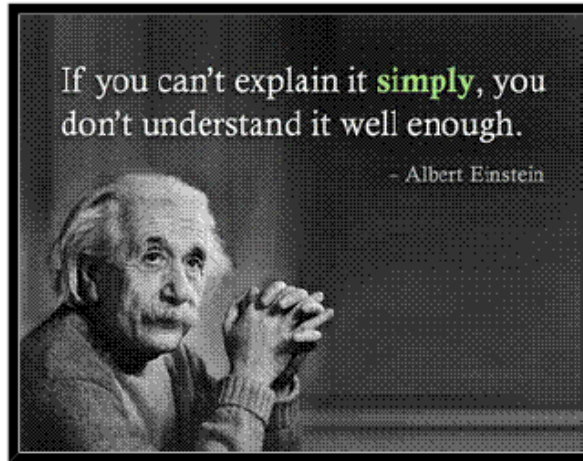


Physics 596 Course Introduction, Fall '19



Physics 596

Graduate Physics Orientation Fall 2019

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/fa2019/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: Charles Gammie, Nicolas Yunes

AMO/Quantum Information: Elizabeth Goldschmidt

Biological physics: Ido Golding, Martin Gruebele, Sangjin Kim, Zan Luthey-Schulten, Paul Selvin, Diwakar Shukla, Charles Sing

Condensed matter experiment: Alexey Bezryadin, Tai Chiang, Axel Hoffmann, Fahad Mahmood, Nadya Mason, Yingjie Zhang

Condensed matter computation/theory: Karin Dahmen, Elif Ertekin, Nancy Makri, Lucas Wagner

High Energy: Ben Hooberman, Yonatan Kahn, Jessie Shelton

Intermediate energy/Nuclear Physics: Jacquelyn Noronha-Hostler, Anne Sickles

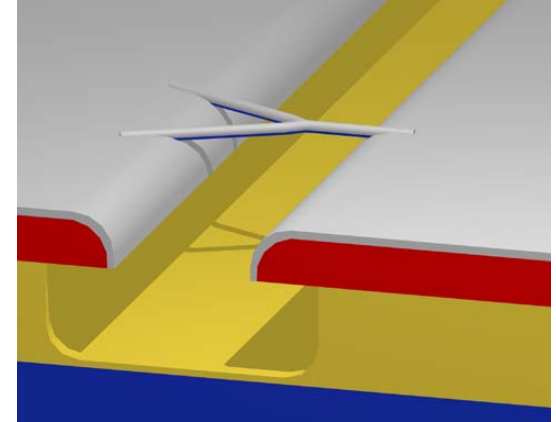
Elements of Phys 596

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

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. Experience with collaborations: working in teams

Team	Last Name	First Name
1	Alam	Md Faisal
	Arnold	Nathan
	Arya	Shreya
	Bielinski	Nina
2	Cao	Xuchen
	Cardenas-Avendano	Alejandro
	Carzon	Patrick
	Xu	Gonghan
3	Deich	Alexander
	Dhruv	Vedant
	Dore	Travis
	Goldman	Samuel
4	Goswami	Arjun
	Graham-Bailey	Robeson
	Gupta	Vaibhav
	Joshi	Abhishek
5	Kleiner	Kevin
	Lantz	Chad
	Li	Zheyu
	Liu	Ming-Wei

6	Maier	John
	Mezzasoma	Simone
	Moy	Benamin
	Tan	Hung
7	Nguyen	Rachel
	Owen	Caroline
	Perkins	Scott
	Qu	Kejian
8	Rangel	Jacob
	Santiago	Nicolas
	Schumacher	Kristen
	Murzabekova	Azel
9	Zhang	Chenghao
	Tian	Minyang
	Wagle	Pratik
	Wang	Zihan
10	Wild	Drew
	Williams	Garrett
	Woods	Danielle
	Xie	Yiqi
11	Chandramouli	Rohit
	Thibodeau	Matthew
	Zhang	Nan
	Zhao	JinChao

<https://courses.physics.illinois.edu/phys596/fa2019/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 2019

(Syllabus is subject to change!)

<https://courses.physics.illinois.edu/phys596/fa2019/syllabus.htm>

Week	Date	Topics	Lectures	Assignments	Reading
1	Aug 30	Introduction and course expectations How to find an advisor	slides slides	Major Group Assignment Create and present a group Journal Club PowerPoint talk + individual referee reports	
2	Sep 6	Research in General Relativity and Gravitation - Prof. Nicolas Yunes Creating/giving a journal club presentation How to read scientific papers	slides slides		

Our agenda (cont.)

3	Sep 13	<p>Research in Astrophysics, Gravitation, and Cosmology - <u>Prof. Charles Gammie</u></p> <p>Research in Biological Physics - <u>Prof. Martin Gruebele</u></p> <p>Research in Spin Transport and Magnetization Dynamics - <u>Prof. Axel Hoffmann</u></p>			
4	Sep 20	<p>Research in Experimental Condensed Matter Physics - <u>Prof. Tai Chiang</u></p> <p>Research in Biological Physics - <u>Prof. Ido Golding</u></p> <p>How to use on-line scientific resources</p> <p>On-line research with SCOPUS</p>	<p>slides</p> <p>slides</p>	<p><u>mini- Assignment #1</u></p> <p>On-line resource activities</p>	<p><u>Resource Activities</u></p> <p><u>Prof. Casey Miller's (RIT) advice on using scientific resources</u></p>
5	Sep 27	<p>Research in Theoretical High Energy Physics - <u>Prof. Yonatan Kahn</u></p> <p>Research in Experimental Nuclear Physics - <u>Prof. Anne Sickles</u></p> <p>Publication process; How to write a referee report</p>	<p>slides</p>		

Our agenda (cont.)

6	Oct 4	<p>Research in Theoretical Condensed Matter Physics - Prof. Karin Dahmen</p> <p>Research in Theoretical High Energy Physics - Prof. Jessie Shelton</p> <p>Research in Experimental Quantum Information Science - Prof. Elizabeth Goldschmidt</p>			
7	Oct 11	<p>Research in Experimental Condensed Matter Physics - Prof. Fahad Mahmood</p> <p>Research in Biological Physics - Prof. Sangjin Kim</p> <p>Research in Experimental Condensed Matter Physics - Prof. Nadya Mason</p> <p>How to write a scientific abstract</p>	slides	<p>mini-Assignment #2 Write an abstract for selected paper</p>	Abstract Papers
8	Oct 18	Ethics in research	slides		Ethics Case Studies
9	Oct 25	<p>Research in Quantum Electronic, Spintronic, and Energy Materials - Prof. Yingjie Zhang</p> <p>Research in Computational Condensed Matter Physics - Prof. Lucas Wagner</p> <p>Research in Biological Physics - Prof. Paul Selvin</p>			

Our agenda (cont.)

10	Nov 1	<p>Research in Theoretical Nuclear Physics - Prof. Jacquelyn Noronha-Hostler</p> <p>Research in Experimental Condensed Matter Physics - Prof. Alexey Bezrvadin</p> <p>Research in the Physics of Living Systems - Prof. Zan Luthey-Schulten</p>			
11	Nov 8	<p>Research in Theoretical and Computational Soft Condensed Matter and Biophysics - Prof. Charles Sing</p> <p>Research in Computational Biological Physics - Prof. Diwakar Shukla</p> <p>Template for a journal club presentation</p>			
12	Nov 15	<p>Research in Experimental High Energy Physics - Prof. Ben Hooberman</p> <p>Research in Theoretical and Computational Condensed Matter Physics - Prof. Nancy Makri</p> <p>Research in Computational Condensed Matter Physics - Prof. Elif Ertekin</p>	Scientific Poster Example/Template		

Our agenda (cont.)

13	Nov 22	Journal club presentations:			
	Nov 29	Thanksgiving Break			
14	Dec 6	Journal club presentations:			
