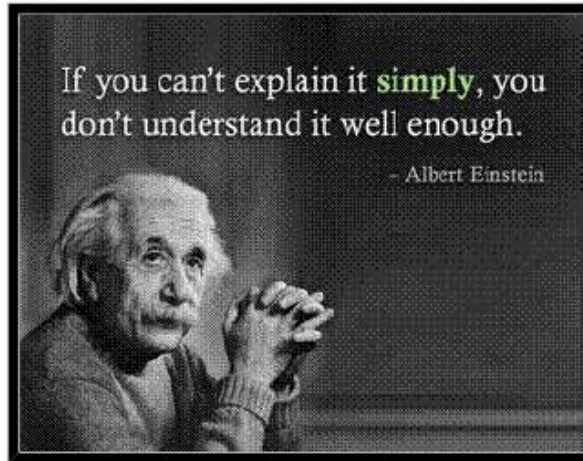


# Physics 596 Course Introduction, Fall '24

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## Physics 596

Graduate Physics Orientation

Fall 2024

*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: 227B Loomis, 333-2589

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

Course Webpage: <https://courses.physics.illinois.edu/phys596/fa2024/index.html>

# Our goals for you in Phys 596

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**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: Help Finding a Research Group

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## 25 Faculty talks scheduled so far:

AMO/Quantum Information: Jake Covey, Wolfgang Pfaff

Astrophysics/Gravitation/Cosmology: Charles Gammie, Hector Silva, Antonios Tsokaros

Biological physics computation and experiment: Alek Aksimentiev, Yann Chemla, Ido Golding, Sangjin Kim, Jun Song, Zan Schulten

Condensed matter experiment: Alexey Bezryadin, Lu Chen, Vidya Madhavan, Fahad Mahmood, Pengjie Wang, Yingjie Zhang, Peter Zhou

Condensed matter computation/theory: David Ceperley, Karin Dahmen, Rafael Fernandes, Taylor Hughes, Nancy Makri, Smitha Vishveshwara

High Energy Physics: Ben Hooberman

Intermediate Energy/Nuclear Physics:

# Elements of Phys 596: Refine Research Skills

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## 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

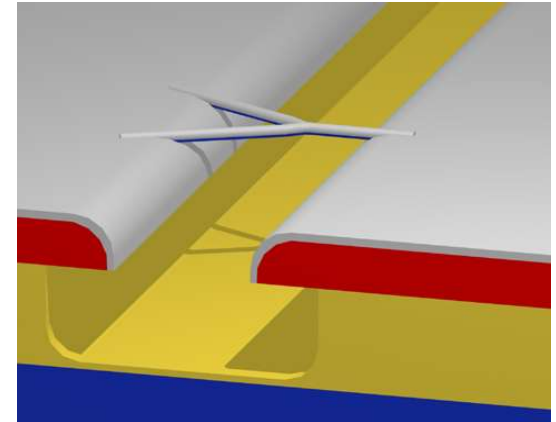
## Learning how to do what scientists do

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?

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It's not just all about good data/calculations: you will be judged as much for the quality and accessibility of your logical 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: Practice Collaboration

<https://courses.physics.illinois.edu/phys596/fa2024/courseinfo.html>

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	Souza Ramos	Vitor	vitores2@illinois.edu

# Grading Policy

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- 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

Lectures will be videotaped and posted on “Phys 596 Fall 2024” Channel on Media Space

<https://courses.physics.illinois.edu/phys596/fa2024/syllabus.htm>

[Physics 596 Fall 2024 Channel on Media Space](#)

Week	Date	Topics	Lectures	Assignments	Reading	Zoom/Video
1	Aug 30	<p>Introduction and course expectations</p> <p>Finding an advisor and tips for succeeding in grad school</p> <p>Discussion with Physics Grad Student Leadership of the Graduate Peer Mentoring (GPM) program</p>	<p><a href="#">slides</a></p> <p><a href="#">slides</a></p>	<p><a href="#">Major Group Assignment</a> Create and present a group Journal Club PowerPoint talk + individual referee reports</p>		<p><a href="#">Zoom Link</a></p> <p><a href="#">Video Recording</a></p>
2	Sep 6	<p>Research in Theoretical Condensed Matter Physics and Grad School Advice - Prof. Taylor Hughes</p> <p>Creating/giving a journal club presentation</p> <p>How to read scientific papers</p>	<p><a href="#">slides</a></p> <p><a href="#">slides</a></p>			<p><a href="#">Zoom Link</a></p> <p><a href="#">Video Recording</a></p>
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# Physics 596 Fall 2024 Media Space Channel

[Phys 596 Fall 2024 Media Space Channel](#)

media space  
Illinois

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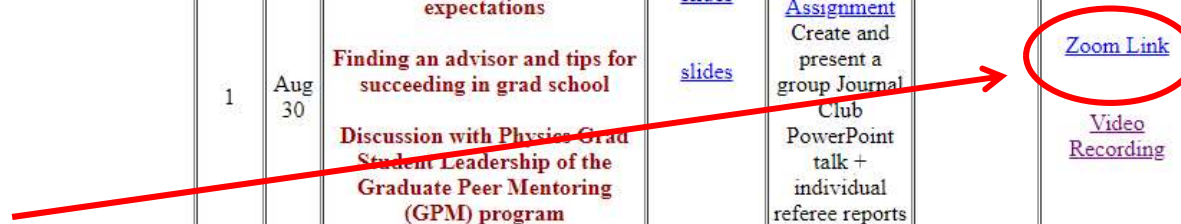
Bookmark and  
subscribe to get  
posting  
notifications

# Our agenda

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Zoom links to the lectures can be found here for students attending remotely

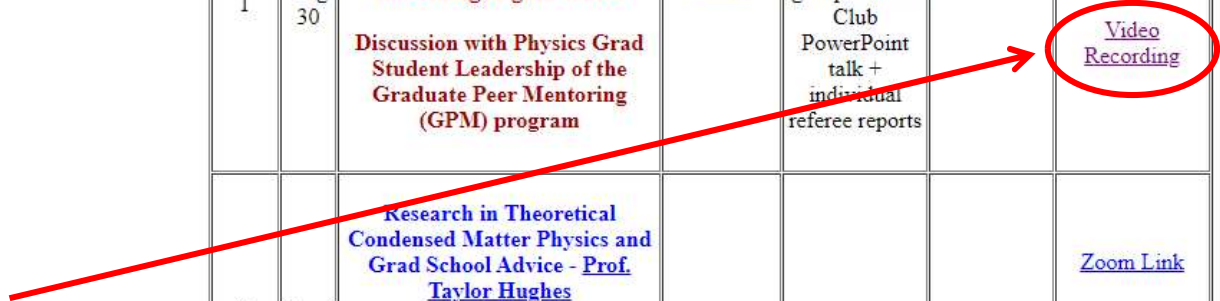


# Our agenda

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Links to lecture videotapes on the Phys 596 Media Space channel can be accessed here



# Our agenda

## Physics 596 Fall 2024 Channel on Media Space

<https://courses.physics.illinois.edu/phys596/fa2024/syllabus.htm>

Research lectures  
by faculty looking  
for students  
(in blue)

Week	Date	Topics	Lectures	Assignments	Reading	Zoom/Video
1	Aug 30	<p>Introduction and course expectations</p> <p>Finding an advisor and tips for succeeding in grad school</p> <p>Discussion with Physics Grad Student Leadership of the Graduate Peer Mentoring (GPM) program</p>	<p><a href="#">slides</a></p> <p><a href="#">slides</a></p>	<p><a href="#">Major Group Assignment</a></p> <p>Create and present a group Journal Club</p> <p>PowerPoint talk + individual referee reports</p>		<p><a href="#">Zoom Link</a></p> <p><a href="#">Video Recording</a></p>
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# Our agenda

## Physics 596 Fall 2024 Channel on Media Space

<https://courses.physics.illinois.edu/phys596/fa2023/syllabus.htm>

Professional development activities and lectures (in brown)

Week	Date	Topics	Lectures	Assignments	Reading	Zoom/Video
1	Aug 30	<p>Introduction and course expectations</p> <p>Finding an advisor and tips for succeeding in grad school</p> <p>Discussion with Physics Grad Student Leadership of the Graduate Peer Mentoring (GPM) program</p>	<p><a href="#">slides</a></p> <p><a href="#">slides</a></p>	<p><a href="#">Major Group Assignment</a></p> <p>Create and present a group Journal Club</p> <p>PowerPoint talk + individual referee reports</p>		<p><a href="#">Zoom Link</a></p> <p><a href="#">Video Recording</a></p>
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# Our agenda (cont.)

<https://courses.physics.illinois.edu/phys596/fa2024/syllabus.htm>

4	Sep 20	<p>Research in Experimental Condensed Matter Physics - <a href="#">Prof. Pengjie Wang</a></p> <p>Research in Experimental High Energy Physics - <a href="#">Prof. Ben Hooberman</a></p> <p>Research in the Quantum Dynamics of Condensed Phases - <a href="#">Prof. Nancy Makri</a></p> <p>How to use on-line scientific resources</p>	<a href="#">slides</a>			<p><a href="#">Zoom Link</a></p> <p><a href="#">Video Recording</a></p>
5	Sep 27	<p>Research in Theoretical Astrophysics - <a href="#">Prof. Charles Gammie</a></p> <p>Research in Experimental Biophysics - <a href="#">Prof. Ido Golding</a></p> <p>Research in Experimental Biological Physics - <a href="#">Prof. Yann Chemla</a></p>				<p><a href="#">Zoom Link</a></p> <p><a href="#">Video Recording</a></p>
6	Oct 4	<p>Research in Computational Condensed Matter Physics - <a href="#">Prof. David Ceperley</a></p> <p>Research Theoretical Condensed Matter Physics - <a href="#">Prof. Smitha Vishveshwara</a></p> <p>Research in Experimental Condensed Matter Physics - <a href="#">Prof. Alexey Bezryadin</a></p>				<p><a href="#">Zoom Link</a></p> <p><a href="#">Video Recording</a></p>

# Our agenda (cont.)

7	Oct 11	<p>Research in Experimental Biological Physics - <a href="#">Prof. Sangjin Kim</a></p> <p>Research in Theoretical Condensed Matter Physics - <a href="#">Prof. Karin Dahmen</a></p> <p>How to write a scientific abstract</p>	<a href="#">slides</a>	<p><a href="#">mini-Assignment #2</a> Write an abstract for selected paper</p>	<a href="#">Abstract Papers</a>	<p><a href="#">Zoom Link</a></p> <p><a href="#">Video Recording</a></p>
8	Oct 18	<p><b>Ethics in research</b></p>	<a href="#">slides</a>		<a href="#">Ethics Case Studies</a>	<p><a href="#">Zoom Link</a></p> <p><a href="#">Video Recording</a></p>
9	Oct 25	<p>Research in Experimental Materials Science - <a href="#">Prof. Peter Zhou</a></p> <p>Research in Experimental AMO/Quantum Information - <a href="#">Prof. Jake Covey</a></p> <p>Research in Experimental Condensed Matter Physics - <a href="#">Prof. Vidya Madhavan</a></p>				<p><a href="#">Zoom Link</a></p> <p><a href="#">Video Recording</a></p>
10	Nov 1	<p>Research in Experimental Quantum Information - <a href="#">Prof. Wolfgang Pfaff</a></p> <p>Research in Theoretical/Computational Astrophysics - <a href="#">Prof. Antonios Tsokaros</a></p> <p>Research in Experimental Condensed Matter and Materials Physics - <a href="#">Dr. Yingjie Zhang</a></p>		<p>Solve Fermi problems as a team (problems will be distributed before class)</p>	<a href="#">Fermi Problems</a>	<p><a href="#">Zoom Link</a></p> <p><a href="#">Video Recording</a></p>

Scientific ethics training required by OVCR Office



# Our agenda (cont.)

Team journal club presentations



11	Nov 8	<b>Research in Theoretical Astrophysics - Prof. Hector Silva</b> <b>Research Talk -</b> <b>Tips for Effective Scientific Communication</b>	<a href="#">slides</a>			<a href="#">Zoom Link</a>  <a href="#">Video Recording</a>
12	Nov 15	<b>Research in Experimental Condensed Matter Physics - Prof. Lu Chen</b> <b>Research in Experimental Condensed Matter Physics - Prof. Fahad Mahmood</b> <b>Research Talk -</b>				<a href="#">Zoom Link</a>  <a href="#">Video Recording</a>
13	Nov 22	<b>Journal club presentations:</b>	<a href="#">Oral Presentation Evaluation Form</a>			<a href="#">Zoom Link</a>  <a href="#">Video Recording</a>
	Nov 29	<b>Thanksgiving Break</b>				
14	Dec 6	<b>Journal club presentations:</b>	<a href="#">Oral Presentation Evaluation Form</a>			<a href="#">Zoom Link</a>  <a href="#">Video Recording</a>