Introductions and General Information (~70 minutes)
Lance Cooper.....Welcome
Luke Prunkard..............Information on Facilities/Keys/Inventory
Rebecca Wiltfong.............Information on My Physics/Website
Elaine Schulte............Information for Graduate Teaching Assistants
Mary Schlembach.........Information on the Physics Library
Abhishek Joshi and Dmitry Manning-Coe........Physics Grad Student Association
Shubhang Goswami, Vaibhav Gupta, and Kai Shinbrough....GEO

Break (15 minutes)

Grad Program Information (~25 minutes)
Lance Cooper....Overview of the Illinois Physics Grad Program

TA Training Session: 2:00 – 5:00 p.m. CT (Elaine Schulte and others)
New Grad Student Checklist

- Things you should have done or need to do before Aug. 23:
  - Completed your employment paperwork (I-9 form, New Hire form) if you’re a TA or RA
  - Registered for classes on-line!
    -- You must maintain at least 9 credit hours each semester to be a full-time student and keep an assistantship ⇒ No Later than Sept. 3!
  - Received and accepted your teaching/research assistantship offer
  - Received your teaching assignment if you’re a TA
    -- Sign up for mandatory campus TA training next week! Watch TA training “bootcamp” this afternoon

If you’re having trouble getting any of these things done, please contact me!
Bookmark the Grad Student Blog!
https://physics.illinois.edu/academics/graduates/blog/

Information consolidated in Physics Graduate Student Handbook
Campus Building Access Requirements

https://covid19.illinois.edu/guides/students/

First, Download the Safer Illinois App:
https://covid19.illinois.edu/health-and-support/safer-illinois-app/

“Building Access Granted” Status Requires:

If you’re fully vaccinated: Upload your vaccination information to the McKinley Portal: https://mymckinley.illinois.edu/ (Access “Granted” status takes about 1-2 weeks)

If you’re not fully vaccinated: You will need to take a COVID-19 test and receive negative results twice per week: https://covid19.illinois.edu/health-and-support/on-campus-covid-19-testing/

Face Masks are Mandatory for Everyone in Campus Facilities (unless alone in a private space)!
https://covid19.illinois.edu/health-and-support/face-coverings/

To Request Loomis/MRL Building Keys: Use Key Request on MyPhysics:
https://my.physics.illinois.edu/keys/request/
COVID-19 Testing

https://covid19.illinois.edu/health-and-support/on-campus-covid-19-testing/

Requirements Due To COVID-19:

COVID-19 Testing Locations
Campus testing locations are listed here: https://covid19.illinois.edu/on-campus-testing-locations/

COVID-19 Resources here and in Section 18 of Grad Handbook
Other COVID-19 Resources

https://physics.illinois.edu/academics/graduates/covid-19

Various COVID-19 Related Information, Health, and Immigration Resources:

University COVID-19 Website
The University’s COVID-19 website with information and resources can be found here: https://covid19.illinois.edu/

Graduate College COVID-19 Updates
The Graduate College maintains a COVID-19 website with information and updates of particular interest to graduate students: https://grad.illinois.edu/covid-19/updates

International Student & Scholar Services (ISSS) COVID-19 Updates
International Student & Scholar Services (ISSS) maintains a COVID-19 website with information and updates of particular interest to international graduate students: https://isss.illinois.edu/updates/coronavirus.html

COVID-19 Health Support Resources
The campus maintains a list of virtual counseling and medical support resources available to students: https://studentaffairs.illinois.edu/node/11962
DEGREE REQUIREMENTS

COURSE REQUIREMENTS

The Graduate College requires 96 hours (formerly 24 units) of course work for the PhD, including research units in Physics 597 and Physics 599. Most physics students having half-time assistantships take 8 hours per semester plus 4 to 8 hours in the summer, so the total credit requirement may be fulfilled in approximately four years. Note that at least 8 hours of PHYS 599 Thesis Research is required; most students have many more.

AS A BREADTH REQUIREMENT, TWO OF THE FOLLOWING SEVEN COURSES ARE REQUIRED

- Physics 540 Theoretical Astrophysics
- Physics 550 Biophysical Physics
- Physics 560 Condensed Matter Physics I
- Physics 569 Emergent States of Matter
- Physics 570 Subatomic Physics
- Physics 513 Topics in Quantum Optics and Information
- Physics 514 Modern Atomic Physics

Suitable substitute breadth course(s) approved by the Associate Head for Graduate Programs.

Note that only one of either the Physics 560 or Physics 569 courses counts toward the breadth requirement and only one of either Physics 513 or Physics 514 counts toward the breadth requirement.

In addition, all students are urged to take Quantum Mechanics I and II (Physics 580 and 581), Mathematical Methods A and B (Physics 508 (MMA) and Physics 509 (MMB), Classical Electromagnetism (Physics 505), and Statistical Physics (Physics 504). Students will find a number of advanced courses on more specialized topics indispensable in their preparation for research.

The department has no formal language requirement. Graduate students may find it advantageous, however, to be proficient in reading articles in a foreign language. For this reason, graduate students are allowed to enroll in language courses offered in the various language departments at Illinois.
First Year Courses at UIUC

- There are few course requirements
  - Biophysics
  - Nuclear and Particle
  - Astrophysics
  - Quantum Optics & Information or Atomic Physics
  - Condensed Matter or Emergent States of Matter
  - Appropriate substitute course

- But it’s likely you will start with
  - Quantum Mechanics I and II (580, 581)
  - Mathematical Methods 1 and 2 (508, 509)
  - Electricity and Magnetism (505), Statistical Mechanics (504)
  - Undergraduate Quantum 2 (487), E&M 2 (436), Classical Mech 2 (326), Stat Mech (427)

- And everyone takes 596 (Physics Orientation)
First Few Semesters at UIUC

Advanced courses specialize

- Condensed Matter Physics II
- Quantum Field Theory I and II
- Particle Physics
- General Relativity
- Nonequilibrium Statistical Physics
- Special topics (Phys 598) courses – one benefit of a big department!!

After your first year or two, you will primarily take research credits:

Physics 597, Independent Study – Graded class, taken prior to prelim

Physics 599, Thesis Research – Taken once you pass your prelim

TAs and RAs should always register for at least 9 credit hours in the Fall and Spring terms to be full-time students! Fellowship students should register for 12 credit hours while on fellowship.
First Few Semesters at UIUC

- Teaching
  - This is important training, giving you an opportunity to make an impression on professors you might do research with, so take it seriously!
  - A chance to learn how to be a good teacher: we have many award-winning TAs! This looks good on your resume, especially if you’re applying for faculty positions!
The Qual:

- Qual exam is scheduled for Saturday, Aug. 21 and Sunday, Aug. 22, 12:30 (check in) – 5 pm. The exam starts at 1:00 pm both days. You can register via this link: https://my.physics.illinois.edu/grad/qual-signup

- Room assignments will be sent out early next week

- Qual FAQ and problems can be found here: http://physics.illinois.edu/academics/graduates/qual-faq

- The August 2021 Qual Information Session can be viewed on-line here: https://mediaspace.illinois.edu/media/t/1_b6mgqe20/179926551
Qual Exam Info on the Blog
https://physics.illinois.edu/academics/graduates/qualifying-examination

Qual exam information and problems can be accessed here
Research !!

- **Picking an advisor** (there are many available)
  - Physics 596 Research Talks in Fall
  - Research opening advertisements on Grad Student Blog
  - Make your own one-on-one arrangements!
  - Start looking early, attend seminars, talk to faculty!

### Research Areas

- **Condensed Matter Physics**
  - 14 experimentalists
  - 10 theorists

- **AMO/Quantum Information**
  - 6 experimentalists

- **Biological Physics**
  - 4 experimentalists
  - 3 theorists

- **High Energy Physics**
  - 3 experimentalists
  - 5 theorists

- **Medium Energy (Nuclear) Physics**
  - 4 experimentalists
  - 2 theorists

- **Astrophysics/Gravitation/Cosmology**
  - 2 experimentalists
  - 7 theorists

- **Cross-Cutting Research**
  - 2 experimentalists

- **Physics Education Research**
  - 3 researchers
• Research opportunities in the department, finding advisors, etc.

• Instruction/practice in scientific writing and presentation

• Scientific publishing process, using on-line resources, etc., etc.

https://courses.physics.illinois.edu/phys596/fa2021/

Make sure you register for this course! It is required!
Interested in applying for a grad fellowship?

- 1st year and (most) 2nd year grad students are eligible
- Celia and I will hold a virtual NSF Fellowship Workshop, 6-8 pm on Wednesday, Sept. 15
- We will hold an NSF Fellowship pre-competition in October
- Stay tuned to the grad blog for more details!
Years 2-N: Focus on Research

- You’ll join a group
  - By no later than the summer after your first year
  - Often supported by an RA but otherwise you can still be a TA
  - Trial research period, and you can still make changes

- Want to attend a conference/workshop not supported by your advisor or do you need supplemental funds for emergencies?
  - Physics Grad Travel Award program
Grad Travel Award Program

TRAVEL FUND APPLICATION

PURPOSE
The purpose of the Department of Physics Graduate Student Travel Award Fund is to provide opportunities for graduate students to participate (remotely or in person) in special conferences or workshops, to participate in professional development activities that are not funded by their advisors' research grants, or to supplement student funding for unanticipated medical, financial, or educational expenses. Awards will typically be limited to a maximum of $500, although higher award amounts are possible in exceptional circumstances.

APPLICATION SCHEDULE
The 2021-2022 Physics Grad Travel Award program will be divided into three time periods. Applications should be submitted by the following dates if possible:

- **September 1, 2021**, for September 1, 2021 – January 31, 2022 conference participation or supplementary funds
- **February 1, 2022**, for February 1 – May 31, 2022 conference participation or supplementary funds
- **May 1, 2022**, for June 1 – August 31, 2022 conference participation or supplementary funds

Applications may be accepted for reimbursements, and it is preferred that applications be received at least 30 days before funds are needed. Questions about deadlines and submissions should be directed to Professor Lance Cooper (lcooper@illinois.edu), associate head for graduate programs.

APPLICATION EVALUATION PROCESS
Applications will be reviewed by the associate head for graduate programs, and final decisions will be made by the associate head for graduate programs. Applicants will be informed of the final decisions. All decisions of the associate head are final.

APPLICATION REVIEW CRITERIA
Review criteria include:

1. An assessment of how the proposed conference participation will contribute to the student’s professional development or a brief explanation describing why supplementary funds are needed.
2. The student’s past history of travel support by the department (for conference participation awards).
3. Time remaining to PhD degree (for conference participation awards).
The Prelim

- 15 page paper, oral presentation
- “Proposal” for your thesis research
- Typically in 3rd or 4th year

https://physics.illinois.edu/academics/graduates/preliminary-examination
Thesis defense

- Your own personal “book”: you’re the world’s expert!
- Time to Ph.D. ~ 6.5 years on average (depends on field)

https://physics.illinois.edu/academics/graduates/thesis
Life After UIUC Grad School

- Universities (post docs and faculty)
- Government Research Laboratories
  - Argonne, Fermilab, Jefferson Lab, NISTs, LANL, Livermore, LBL, Sandia, NRL, …
- Industry
  - Intel, IBM, AT&T, HP, Microsoft, AMD, Shell, Kodak, and hosts of high-tech start-ups
- Computing (hardware and software)
- Wall Street
- Management consulting
- Science policy
- Science writing and publishing
We maintain a database of our past ~561 PhD alumni for the past 16 years.
Physics Careers Seminars will be a mix of virtual and in-person seminars through Fall 2021. I’ll circulate a Zoom link to the grad students prior to the seminar. Current schedule (in progress):

<table>
<thead>
<tr>
<th>EVENT TITLE</th>
<th>SPEAKER</th>
<th>DATE/TIME</th>
<th>LOCATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physics Careers Seminar</td>
<td>Dr. Michelle Victoria, Software Engineer, RightHand Robotics, Inc.</td>
<td>9/9/2021 12 p.m.</td>
<td>Via ZOOM - see description for link</td>
</tr>
<tr>
<td>Physics Careers Seminar</td>
<td>Dr. Srinidhi Ramamurthy, Chief Data Officer, Uplift Inc.</td>
<td>9/16/2021 12 p.m.</td>
<td>TBD</td>
</tr>
<tr>
<td>Physics Careers Seminar</td>
<td>Dr. Erik Huemiller, Researcher, General Motors Research &amp; Development</td>
<td>9/23/2021 12 p.m.</td>
<td>Via ZOOM - see description for link</td>
</tr>
<tr>
<td>Physics Careers Seminar</td>
<td>Dr. Brianne Gutmann, AAAS Fellow, National Science Foundation</td>
<td>10/22/2021 12 p.m.</td>
<td>TBD</td>
</tr>
</tbody>
</table>
Departmental seminars will be a mix of virtual + in-person seminars in Fall 2021.

### PHYSCS SEMINARS

<table>
<thead>
<tr>
<th>MONDAYS</th>
<th>TIME</th>
<th>SCHEDULE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Institute for Condensed Matter Theory Seminar</td>
<td>12:00 p.m.</td>
<td>Schedule</td>
</tr>
<tr>
<td>Medium &amp; High Energy Physics Seminar</td>
<td>1:00 p.m.</td>
<td>Schedule</td>
</tr>
<tr>
<td>Theoretical Biophysics Seminar</td>
<td>3:00 p.m.</td>
<td>Schedule</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>TUESDAYS</th>
<th>TIME</th>
<th>SCHEDULE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Astronomy Colloquium and Seminars</td>
<td>3:45 p.m.</td>
<td>Schedule</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>WEDNESDAYS</th>
<th>TIME</th>
<th>SCHEDULE</th>
</tr>
</thead>
<tbody>
<tr>
<td>QUIST Seminar</td>
<td>1:00 p.m.</td>
<td>Schedule</td>
</tr>
<tr>
<td>Astrophysics, Gravitation, and Cosmology Seminar</td>
<td>12:00 p.m.</td>
<td>Schedule</td>
</tr>
<tr>
<td>Physics Colloquium</td>
<td>4:00 p.m.</td>
<td>Schedule</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>THURSDAYS</th>
<th>TIME</th>
<th>SCHEDULE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mathematical and Theoretical Physics Seminar</td>
<td>1:00 p.m.</td>
<td>Schedule</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>FRIDAYS</th>
<th>TIME</th>
<th>SCHEDULE</th>
</tr>
</thead>
<tbody>
<tr>
<td>High Energy Phenomenology Seminar</td>
<td>12:00 p.m.</td>
<td>Schedule</td>
</tr>
<tr>
<td>Condensed Matter Physics Seminar</td>
<td>1:00 p.m.</td>
<td>Schedule</td>
</tr>
<tr>
<td>Biological Physics Seminar</td>
<td>2:00 p.m.</td>
<td>Schedule</td>
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</tbody>
</table>

https://physics.illinois.edu/calendar/seminar
Advice: Get to know your interesting classmates!

Portrait of the diverse Fall 2021 Illinois Physics Graduate Class:

- 36 students in the Fall 2021 grad class enrolling this fall (2 more deferring until Spring or Fall 2022)
- 23 Male, 13 Female
- 16 International Students, 20 Domestic Students
- Citizenship: US (20), China (5), India (3), Brazil, Columbia, Kuwait, Mauritius, Pakistan, Singapore, Taiwan, Vietnam
- 34 on campus, 2 off campus outside US (at least temporarily)
Advice: Keep socially active!

Getting involved with grad social groups helps relieve the stress of grad school. Many of these groups will continue meeting virtually.

- Physics Grad Student Association
- Illinois-GPS: Grad/undergrad mentoring group
- Women in Physics & Astro
- Grad Peer Mentoring: Grad mentoring of 1st-year grad students
- Diversity Committee
Advice: Stay safe!

Our campus and community is reasonably safe, but it’s important to be aware of your surroundings, particularly at night.
Advice: Know who to contact if you need help!

Contact me if you don’t know who to ask!

### 24-Hour Emergency Numbers

<table>
<thead>
<tr>
<th>Service</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Life-threatening fire, police, or medical emergency</td>
<td>9-9-11 (on-campus) or 911 (off-campus)</td>
</tr>
<tr>
<td>Emergency Dean (available 24/7 to assist students or their families in crisis)</td>
<td>333-0050</td>
</tr>
<tr>
<td>Domestic Violence Hotline (A Woman’s Place)</td>
<td>304-4390</td>
</tr>
<tr>
<td>Crisis Line (24-hour suicide prevention and crisis hotline)</td>
<td>244-7611 or 350-1141</td>
</tr>
<tr>
<td>Faculty/Staff Assistance Program</td>
<td>244-5312</td>
</tr>
<tr>
<td>National Capital Poison Center</td>
<td>1-(800)-222-1222</td>
</tr>
</tbody>
</table>

### Non-Emergency Numbers

<table>
<thead>
<tr>
<th>Fire Departments</th>
<th>Police Departments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Champaign</td>
<td>University of Illinois</td>
</tr>
<tr>
<td>Urbana</td>
<td>Champaign</td>
</tr>
<tr>
<td>Savoy</td>
<td>Urbana</td>
</tr>
<tr>
<td>Champaign County Sheriff</td>
<td>Savoy</td>
</tr>
<tr>
<td>403-7200</td>
<td>333-1210</td>
</tr>
<tr>
<td>384-2420</td>
<td>351-8911</td>
</tr>
<tr>
<td>359-5814</td>
<td>384-2320</td>
</tr>
<tr>
<td>333-8911</td>
<td>333-8911</td>
</tr>
</tbody>
</table>

### Hospitals and Medical Services

<table>
<thead>
<tr>
<th>Hospital</th>
<th>Phone</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carle Hospital Emergency Room</td>
<td>383-3313</td>
</tr>
<tr>
<td>Provena Covenant Medical Center Emergency Room</td>
<td>337-2131</td>
</tr>
<tr>
<td>McKinley Health Center</td>
<td>222-7701</td>
</tr>
</tbody>
</table>

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Current Grad Info

- Physics Grad Student Handbook
- Curriculum Requirements
- Prelim Exam info
- Thesis Info
- MS Degree Requirements
- CSE Graduate Concentration
- Useful Non-Physics Courses
- PHYS 596
- POSA
- Illinois GPS
- Qual Exam Info
- New Student Info
- Ethics Resources
- Responsible Conduct of Research
- Research Safety Training/Info
- Grad Expertise Database
- Grad Travel Award
- Grad Student Evaluations
- Grad College Calendar
- COE Grad Handbook
- Graduate Student Mentoring Guidelines
- International Student Resources
- Physics Information Resources
- Useful Forms
- Health/Safety Resources
  - Counseling/Mental Health Resources
  - MRT Study Sessions
  - Important Physics Dates
  - Diversity Resources
  - Important Phone Numbers
  - COVID-19 Resources
Advice: Get to know and enjoy the community!

Many parks, restaurants, and facilities are open, but stay safe and socially distanced!

Krannert Center for the Performing Arts

Virginia Theater

Westside and other parks

Downtown Champaign
Cool places in the surrounding area

Lake of the Woods (~15 min)

Turkey Run (Indiana, ~1 hr)

Kickapoo State Park (~30 min)

Allerton Park (~20 min)
Cool places in the surrounding area

St. Louis (~3 hrs)

Indianapolis (~1.5 hrs)

Chicago (~2.5 hrs)
Upcoming Departmental Events

- Annual Micro-aggression Workshop
  - Wednesday, Aug. 18, 1:00 – 2:30 pm
  - Rm. 222/276 Loomis

**Title:** Creating an Equitable and Inclusive Cohort

**Abstract:** Join Ross Wantland, Director of Curriculum Development and Education in the Office of the Vice Chancellor for Diversity, Equity, & Inclusion, for a conversation about strategies for confronting bias and promoting inclusion as Physics graduate students. This program is designed to be as interactive as Zoom allows, so please plan accordingly (i.e., cameras on, able to type into chat, etc.).

**Required workshop for 1st-year physics grad students!**

The workshop will be recorded for those not on campus.
Orientation Events Next Week

**Monday and Tuesday, Aug 16, 17:** Mandatory Campus TA and Grader Training
Let me know if you’re a TA/grader but haven’t received information about these training sessions!

**Wednesday, Aug 18:** Mandatory Microaggressions Workshop
In-person in Rm. 222/276 Loomis, required for all 1st-year physics grad students

**Thursday and Friday, Aug 19, 20:** Intro Course Orientation Meetings
Elaine Schulte will send you information about the time and place of your respective course meetings

**Saturday and Sunday, Aug 21, 22:** Qualifying Exam
Will be held in person, 12:30 – 5:00 pm in Loomis. Make sure to register, I’ll send room assignments early next week.

**Monday, Aug 23:** Fall 2021 Classes Start
Final Piece of Advice

- And always feel free to e-mail or meet with me if you have problems or questions!