Fall 2023 Illinois Physics Grad Student Orientation

Friday, August 11, 2023 (start time: 10 am Central Time)

- **Introductions and General Information** (~70 minutes) – 222/276 Loomis
  
  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
  
  Randy Owen.........Physics Grad Student Association
  
  Kevin Kleiner.........Illinois Physics Graduate Peer Mentoring
  
  Shubhang Goswami and Rohit Chandramouli....Graduate Employees Organization

- **Break** (15 minutes) – Refreshments in 204 Loomis (Interaction Room)

- **Grad Program Information** (~25 minutes) – 222/276 Loomis
  
  Lance Cooper....Overview of the Illinois Physics Grad Program

- **Lunch:** ~12:15 – Lunch in 204 Loomis (Interaction Room)
New Grad Student Checklist

☐ Things you should have done or need to do before Aug. 21:

☑ Completed your employment paperwork (I-9 form, New Hire form) if you’re a TA or RA
  -- Meet with Nicolette (227 Loomis) or Stephanie (290 K Loomis) to complete employment paperwork

☑ 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 (12 credit hours for fellowship students) ⇒ No Later than Sept. 1!

☑ Received and accepted your teaching/research assistantship offer

☑ Received your teaching assignment if you’re a TA
  -- Attend mandatory campus TA training (Aug. 17) and course meetings next week

If you haven’t completed some of these steps, contact me!
Bookmark the Grad Student Blog!
https://physics.illinois.edu/academics/graduates/blog/

Information consolidated in Physics Grad Student Handbook
Curriculum/Course Requirements
https://physics.illinois.edu/academics/graduates/degree-requirements

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 6 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 Biomolecular 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
  or 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 (MMB) 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

Pick 2!

- 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)
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. 19 and Sunday, Aug. 20, 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

- Qual will be held in 222/276 Loomis

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

- The August 2023 Qual Information Session can be viewed on-line here: https://mediaspace.illinois.edu/media/t/1_1vg4hxuz/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!

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<thead>
<tr>
<th>Area</th>
<th>Experimentalists</th>
<th>Theorists</th>
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<tbody>
<tr>
<td>Condensed Matter Physics</td>
<td>14</td>
<td>10</td>
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<tr>
<td>AMO/Quantum Information</td>
<td>6</td>
<td></td>
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<tr>
<td>Biological Physics</td>
<td>4</td>
<td>3</td>
</tr>
<tr>
<td>Astrophysics/Gravitation/Cosmology</td>
<td>2</td>
<td>7</td>
</tr>
<tr>
<td>Cross-Cutting Research</td>
<td>2</td>
<td></td>
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<tr>
<td>Physics Education Research</td>
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<tr>
<td>High Energy Physics</td>
<td>3</td>
<td>5</td>
</tr>
<tr>
<td>Medium Energy (Nuclear) Physics</td>
<td>4</td>
<td>2</td>
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### Agenda for Phys 596
(Friday, 10:00-11:50 am, Rm. 276/222 Loomis):

- 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/fa2023/**

Make sure you register for this course! It is required!
Research !!

- Interested in applying for a grad fellowship?
  - 1st year and (most) 2nd year grad students are eligible
  - Celia and I will hold an NSF Fellowship Workshop, 6-8 pm on Wednesday, Sept. 20
  - 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 2022-2023 Physics Grad Travel Award program will be divided into three time periods. Applications should be submitted by the following dates if possible:

- September 1, 2022, for September 1, 2022 – January 31, 2023 conference participation or supplementary funds
- February 1, 2023, for February 1 – May 31, 2023 conference participation or supplementary funds
- May 1, 2023, for June 1 – August 31, 2023 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).

Application Materials:
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
Years 2-N: Thesis and Defense

https://physics.illinois.edu/academics/graduates/thesis

- Thesis defense
  - Your own personal “book”: you’re the world’s expert!
  - Time to Ph.D. ~ 6.5 years on average (depends on field)
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 ~665 PhD alumni for the past 18 years.

- Industries (33%)
- US Research Universities (33%)
- US National Labs (12%)
- Foreign Research Institutions (12%)
- US non-Research Colleges (3.7%)
- Medical School (1.8%)
- Non-Profits (1.9%)
- Other (1.9%)
Physics Careers Seminars

https://physics.illinois.edu/calendar/careers

We invite 10-12 Illinois Physics PhD alumni to visit each year and describe their careers, recruit, give career advice, etc.

Spring 2023

<table>
<thead>
<tr>
<th>Physics Careers Seminar: &quot;Quantum (&amp; Space) Research at Los Alamos National Laboratory&quot;</th>
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<tbody>
<tr>
<td>Dr. Kristina Meier, Scientist, Los Alamos National Laboratory</td>
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<tr>
<td>Thursday, Jan 19, 2023  11:00 AM</td>
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<thead>
<tr>
<th>Physics Careers Seminar: &quot;Physics Career Opportunities at Lawrence Livermore National Laboratory&quot;</th>
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<tbody>
<tr>
<td>Dr. Philip Powell, Staff Physicist, Lawrence Livermore National Laboratory</td>
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<tr>
<td>Tuesday, Jan 31, 2023  4:00 PM</td>
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<tr>
<th>Physics Careers Seminar: &quot;Career Paths of Physics Degree Holders&quot;</th>
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<tbody>
<tr>
<td>Dr. Brendan Kiburg, Scientist, Fermilab</td>
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<tr>
<td>Friday, Mar 24, 2023  4:00 PM</td>
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<tr>
<th>Physics Careers Seminar</th>
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<tbody>
<tr>
<td>Dr. Rezvan Shahoei, Senior Scientist, Applications Science at Schrodinger, Inc.</td>
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<tr>
<td>Friday, Apr 7, 2023  12:00 PM</td>
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<tr>
<th>Physics Careers Seminar</th>
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<tr>
<td>Dr. Jackson Ang'ong'a, Postdoctoral Researcher, ETH Zurich</td>
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<td>Thursday, Apr 13, 2023  12:00 PM</td>
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A full slate of departmental seminars are available for you to attend during the week:

<table>
<thead>
<tr>
<th>Seminar</th>
<th>Day of Week</th>
<th>Time</th>
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<tbody>
<tr>
<td>Institute for Condensed Matter Theory Seminar</td>
<td>Mondays</td>
<td>12:00 p.m.</td>
</tr>
<tr>
<td>Medium &amp; High Energy Physics Seminar</td>
<td>Mondays</td>
<td>1:00 p.m.</td>
</tr>
<tr>
<td>Theoretical Biophysics Seminar</td>
<td>Mondays</td>
<td>3:00 p.m.</td>
</tr>
<tr>
<td>IQUIST Seminar</td>
<td>Tuesdays</td>
<td>11:00 a.m.</td>
</tr>
<tr>
<td>Astronomy Colloquium and Seminars</td>
<td>Tuesdays</td>
<td>3:45 p.m.</td>
</tr>
<tr>
<td>Astrophysics, Gravitation, and Cosmology Seminar</td>
<td>Wednesdays</td>
<td>12:00 p.m.</td>
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<tr>
<td>Physics Colloquium</td>
<td>Wednesdays</td>
<td>4:00 p.m.</td>
</tr>
<tr>
<td>Mathematical and Theoretical Physics Seminar</td>
<td>Thursdays</td>
<td>1:00 p.m.</td>
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<tr>
<td>High Energy Phenomenology Seminar</td>
<td>Fridays</td>
<td>12:00 p.m.</td>
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Advice: Get to know your interesting classmates!

Portrait of the Fall 2023 Illinois Physics Graduate Class:

- 60 students in the Fall 2023 grad class
- 44 Men, 14 Women, 2 gender non-conforming students
- 22 International students, 38 Domestic students
- Citizenship: US (38), India (9), China (7), Columbia, Iran, New Zealand, Serbia, South Korea, Thailand
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.
# 24-Hour Emergency Numbers

<table>
<thead>
<tr>
<th>Life-threatening fire, police, or medical emergency</th>
<th>9-11 (on-campus) or 911 (off-campus)</th>
</tr>
</thead>
<tbody>
<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>384-4300</td>
</tr>
<tr>
<td>Crisis Line (24-hour suicide prevention and crisis hotline)</td>
<td>244-7911 or 359-4141</td>
</tr>
<tr>
<td>Faculty/Staff Assistance Program</td>
<td>244-8312</td>
</tr>
<tr>
<td>National Capital Poison Center</td>
<td>1-(800)-222-1222</td>
</tr>
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# Non-Emergency Numbers

<table>
<thead>
<tr>
<th>Fire Departments</th>
<th>Police Departments</th>
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<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>
</tbody>
</table>

# Hospitals and Medical Services

| Carle Hospital Emergency Room | 383-3313 |
| Provena Covenant Medical Center Emergency Room | 337-2131 |
| McKinley Health Services | 333-7701 |

**Advice:** Know who to contact if you need help!

Contact me if you don’t know who to ask!
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. 16, 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!
Other Upcoming Events

**Wednesday, Aug 16:** Mandatory Microaggressions Workshop
In-person, 1-2:30 pm in Rm. 222/276 Loomis, required for all 1st-year physics grad students

**Thursday and Friday, Aug 17 and 18:** Grad Academy TA and Grader Training
Let me know if you’re a TA/grader but haven’t received information about these training sessions!

**Thursday and Friday, Aug 18, 19:** Intro Course Orientation Meetings
Elaine Schulte will send you information about the time and place of your respective course meetings

**Saturday and Sunday, Aug 19 and 20:** Qualifying Exam
Will be held in person, 12:30 – 5:00 pm in 222/276 Loomis. Make sure to register

**Monday, Aug 21:** Fall 2023 Classes Start

**Saturday, Sept. 9:** Departmental Picnic in Illini Grove – 4:00 – 7:00 pm
Final Piece of Advice

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