Fall 2018 Illinois Physics Grad Student Orientation

- **Introductions and General Information (~70 minutes)**
  - Matthias Grosse Perdekamp/Lance Cooper.....Welcome
  - Jerry Cook..................Information on Facilities/Keys/Inventory
  - Rebecca Wiltfong.............Information on My Physics/Website
  - Elaine Schulte...............Information for Graduate Teaching Assistants
  - Celia Elliott...........Information on Graduate Fellowships
  - Mary Schlembach.........Information on Library
  - John Bowers and Anabel Romero Hernandez.........Physics Grad Student Assoc.
  - Luis de Jesus Astacio....Grad Peer Mentoring Program
  - Roshni Bano/Brianne Gutmann/Ryan Levy....Graduate Employees Organization

- **Break** (15 minutes)

- **Grad Program Information (~20 minutes)**
  - Lance Cooper....Overview of the Illinois Physics Grad Program

- **Welcome Luncheon:** ~12:00 noon, Interaction Room, Loomis Lab

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

☐ By now, you should have done the following:

☑ Filled out your paperwork with Wendy Wimmer

☑ Met with me for course and teaching assistantship advising

☑ Registered for classes on-line!
  -- You must maintain at least 8 credit hours each semester to be a full-time student and keep an assistantship ⇒ No Later than Sept. 10!

☑ Registered for the qualifying exam (if applicable)
  [Link](https://my.physics.illinois.edu/grad/qual-signup)

☑ Received and accepted your teaching/research assistantship
  -- Sign up for mandatory campus TA training next week! Go to TA training “bootcamp” this afternoon

If you haven’t done this yet, please see me as soon as possible!
 Bookmark the Grad Student Blog!

**GRADUATE STUDENT BLOG**

8/12/2018
Grad Travel Award Application Deadline for Fall 2018 Travel is Sept. 1
**September 1, 2018** is the deadline for Illinois Physics Grad Travel Award applications for September 2018 - January 2019 conference travel.

8/12/2018
Lance Cooper
Prof. Gaurav Bahl has Multiple Research Openings for PhD Students
Students interested in these positions should contact Prof. Bahl with a complete CV, accompanied by a short paragraph highlighting relevant practical experience and coursework.

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Lance Cooper
Prof. Harley Johnson has Research Opening in Theory/Computation of 2D Materials
Prof. Harley Johnson in Mechanical Science & Engineering and the MRL has an opening for a PhD student in theory/computation applied to 2D materials.

**Current Grad Info**
- Curriculum Requirements
- Prelim Exam Info
- Thesis Info
- MS Degree Requirements
- CSE Certificate Program
- Useful Non-Physics Courses
- PHYS 596
- PGSA
- Illinois GPS
- Qual Exam Info
- New Student Info
- Ethics Training/Info
- Responsible Conduct of Research
- Research Safety Training/Info
- Grad Research Openings
- Grad Expertise Database
- Grad Travel Award
- Grad Student Evaluations
- Grad College Calendar
- COE Grad Handbook
- International Student Resources
- Physics Information Resources
Physics Curriculum/Course 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
- Physics 514 Modern Atomic Physics.

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)), Electricity and Magnetism (Physics 505), and Classical and Quantum Mechanical Systems (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 UIUC.

To receive an appointment as a teaching assistant, an international graduate student is required to demonstrate proficiency in spoken English. This proficiency can be demonstrated in one of four ways: By having a score of 24 or above on the speaking sub-section of the Internet Based TOEFL, By having a score of 8 or above on the speaking sub-section of the IELTS academic exam, By having a score of 50 or above on the TSE, or By having a score of 50 or above on the locally-administered UIUC Speak Test. A number of “English as a Second Language” (ESL) courses and helpful tips for English language improvement are provided by the University.
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

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)
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

You will always need to register for at least 8 credit hours in the Fall and Spring terms to be full-time students!
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:**
  - Aug. 27 and 28 this year. FAQ and problems: [http://physics.illinois.edu/academics/graduates/qual-faq](http://physics.illinois.edu/academics/graduates/qual-faq)
  - Make sure to register if you’re taking free-shot: [https://my.physics.illinois.edu/grad/qual-signup](https://my.physics.illinois.edu/grad/qual-signup)
Qual Exam Info on Blog

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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!

- Condensed Matter Physics
  - 12 experimentalists
  - 10 theorists

- High Energy Physics
  - 6 experimentalists
  - 5 theorists

- Atomic-Molecular-Optical Physics
  - 4 experimentalists

- Medium Energy (Nuclear) Physics
  - 5 experimentalists

- Biological Physics
  - 5 experimentalists
  - 5 theorists

- Astrophysics/Cosmology
  - 2 experimentalists
  - 4 theorists

- Cross-Cutting Research
  - 3 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.**

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**Agenda for Phys 596**

(Friday, 11:00-12:50, Rm. 144):

1. **Make sure you register for this course! It is required!**

[Online course materials:](https://courses.physics.illinois.edu/phys596/fa2018/)

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<table>
<thead>
<tr>
<th>Week</th>
<th>Date</th>
<th>Topics</th>
<th>Lectures</th>
<th>Assignments</th>
<th>Reading</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Aug 31</td>
<td>Introduction and course expectations&lt;br&gt;How to find an advisor</td>
<td>slides</td>
<td>Major Group Assignment&lt;br&gt;Create and present a group Journal Club&lt;br&gt;PowerPoint talk + individual referee reports</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Sep 7</td>
<td>Research in Experimental Condensed Matter Physics - Prof. Yingjie Zhang&lt;br&gt;Creating/giving a journal club presentation</td>
<td>slides</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Sep 14</td>
<td>Research in Theoretical Condensed Matter Physics - Prof. Taylor Hughes&lt;br&gt;How to use on-line scientific resources&lt;br&gt;On-line research with SCOPUS</td>
<td>slides</td>
<td>mini-Assignment #1&lt;br&gt;On-line resource activities</td>
<td>Resource Activities&lt;br&gt;Prof. Casey Miller's (U. South Florida) advice on using scientific resources</td>
</tr>
<tr>
<td>4</td>
<td>Sep 21</td>
<td>Research in Theoretical Astrophysics, Gravitation, and Cosmology - Prof. Gil Holder&lt;br&gt;Research in Theoretical Condensed Matter Physics - Prof. Barry Bradlyn&lt;br&gt;Presentation process; How to write a referee report</td>
<td>slides</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
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 Sept. 19
  - 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?
  - Physics 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 attend special conferences or workshops or to participate in professional development activities that are not funded by their advisers’ research grants. Travel Awards will typically be limited to a maximum of $600.

**APPLICATION SCHEDULE**

The 2018-2019 Physics Grad Travel Award program will be divided into three time periods, and we anticipate making 5-8 awards during each period, pending the availability of funds. Applications must be submitted by the following dates:

- September 1, 2018, for September 1, 2018 - January 31, 2019 conference travel
- February 1, 2019, for February 1 – May 31, 2019 conference travel
- May 1, 2019, for June 1 – August 31, 2019 conference travel

Applications will not be accepted for post-travel reimbursement, and the application must be received at least 30 days before the requested travel commences. 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 a graduate student committee appointed 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 travel will contribute to the student’s professional development.
2. The student’s past history of travel support by the department.
3. Time remaining to PhD degree.
Years 2-N: Preliminary Exam

- The Prelim
  - 15 page paper, oral presentation
  - “Proposal” for your thesis research
  - Typically in 3rd or 4th year
Years 2-N: Thesis and Defense

- 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
Job placement

- We maintain a database of our past ~478 PhD alumni for the past 13 years

<table>
<thead>
<tr>
<th># UIUC Physics Grads Placed at Graduation, 2005 - 2018</th>
<th>478</th>
</tr>
</thead>
<tbody>
<tr>
<td>Postdoc</td>
<td>260 (57%)</td>
</tr>
<tr>
<td>US Research Universities</td>
<td>164 (36%)</td>
</tr>
<tr>
<td>Industry</td>
<td>134 (29%)</td>
</tr>
<tr>
<td>US National Laboratories</td>
<td>59 (13%)</td>
</tr>
<tr>
<td>Non-Research Universities or Colleges</td>
<td>16 (3.5%)</td>
</tr>
<tr>
<td>Medical Schools</td>
<td>11 (2.4%)</td>
</tr>
<tr>
<td>Non-Profits</td>
<td>9 (2%)</td>
</tr>
<tr>
<td>Other</td>
<td>9 (2%)</td>
</tr>
<tr>
<td>Unknown</td>
<td>9 (2%)</td>
</tr>
<tr>
<td>Searching (recent graduates)</td>
<td>9 (2%)</td>
</tr>
</tbody>
</table>
# Physics Careers Seminars

## Physics Careers Seminar Schedule, Fall 2018

<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: &quot;Quantitative and Developmental Roles in Finance: Using a Physics Degree at FinTech Companies&quot;</td>
<td>Dr. Ponnuraj Krishnakumar, Akuna Capital</td>
<td>9/13/2018 11 a.m.</td>
<td>204 Loomis (Interaction Room)</td>
</tr>
<tr>
<td>Physics Careers Seminar: &quot;Roundtable Discussion With Sandia National Lab Recruiters&quot;</td>
<td>Sandia National Lab Recruiters: Drs. Nic Argibay, Mike Chandross, and Andrew Kustas</td>
<td>9/21/2018 11 a.m.</td>
<td>204 Loomis (Interaction Room)</td>
</tr>
<tr>
<td>Physics Careers Seminar: &quot;Job Opportunities at Intel&quot;</td>
<td>Panel of Intel Recruiters</td>
<td>9/27/2018 11 a.m.</td>
<td>204 Loomis (Interaction Room)</td>
</tr>
<tr>
<td>Physics Careers Seminar: &quot;The Art of Networking&quot;</td>
<td>Kristina Wright, Associate Director, Engineering Career Services, UIUC</td>
<td>10/4/2018 11 a.m.</td>
<td>204 Loomis (Interaction Room)</td>
</tr>
</tbody>
</table>
Advice: Get to know your interesting classmates!

Portrait of the diverse Fall 2018 Illinois Physics Graduate Class:

- 41 students in the Fall 2018 grad class
- 27 Men, 14 Women
- 18 International Students, 23 Domestic Students
- Citizenship: US (23), China (9), India (3), Canada, Hong Kong, Iran, Nepal, South Korea, Taiwan
- Schools: UIUC (3), UCLA (2), Chicago (2), Zhejiang (2), Berkeley, Brandeis, Cal Tech, Chinese U Hong Kong, Colby, Fudan, Greenville, Hong Kong Baptist, Korea, Maryland, Missouri Sci Tech, North Carolina, Nat Institute of Science, Nat Taiwan, North Florida, Ohio State, Rice, Rochester, Rochester Inst Tech, Rutgers, Sun Yat Sen, Shanghai Jiao Tong, Sharif, Texas, Toronto, UCSD, West Virginia, Wheaton
Advice: Keep socially active!

Getting involved with grad social groups helps relieve the stress of grad school

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

## 24-Hour Emergency Numbers

<table>
<thead>
<tr>
<th>Service Description</th>
<th>Contact Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>Life-threatening fire, police, or medical emergency</td>
<td>9-111 (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>364-4390</td>
</tr>
<tr>
<td>Crisis Line (24-hour suicide prevention and crisis hotline)</td>
<td>244-7611 or 350-1111</td>
</tr>
<tr>
<td>Faculty/Staff Assistance Program</td>
<td>244-0312</td>
</tr>
<tr>
<td>National Capital Poison Center</td>
<td>1-(800)-222-1222</td>
</tr>
</tbody>
</table>

## Non-Emergency Numbers

**Fire Departments**
- Champaign: 403-7200
- Urbana: 384-2420
- Savoy: 359-5814
- Champaign County Sheriff: 333-8911

**Police Departments**
- University of Illinois: 333-1210
- Champaign: 351-8911
- Urbana: 384-2320
- Savoy: 333-8911

## Hospitals and Medical Services

<table>
<thead>
<tr>
<th>Hospital/Service</th>
<th>Phone Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carle Hospital Emergency Room</td>
<td>383-3313</td>
</tr>
<tr>
<td>Provista Covenant Medical Center Emergency Room</td>
<td>337-2131</td>
</tr>
<tr>
<td>Maclean Health System</td>
<td>222-7701</td>
</tr>
</tbody>
</table>

*Contact me and/or Wendy if you don’t know who to ask!*
Advice: Get to know and enjoy the community!

Krannert Center for the Performing Arts

Virginia Theater

Westside and other parks

Downtown Champaign
Advice: Be aware of upcoming community events!

Upcoming Events:

- Taste of Champaign, Aug. 17-18, Westside Park
- Urbana Sweetcorn Festival, Aug. 24-25, Downtown Urbana
- Departmental Picnic, Sept. 15, Illini Grove
- Krannert Opening Night Party Sept. 7
Upcoming Departmental Events

Required workshop for 1st-year physics grad students!

- Micro-aggression Workshop
  - Tuesday, Aug. 21, 2:00 – 3:30 pm
  - Organized by Physics Grad Student Diversity Committee
Upcoming Departmental Events

- Departmental Picnic
  - Saturday, September 15, 4-7 PM, Illini Grove
Final Pieces of Advice

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