RIT
College of Science
School of Physics and Astronomy

Rochester Institute of Technology
School of Physics and Astronomy
College of Science
Rochester, NY 14623-5604
585-475-2421 Fax 585-475-4153

July 17, 2024

Dear Incoming Physics PhD Students,

First, let me welcome you to Rochester, to RIT and the School of Physics and Astronomy.

This letter contains some information on orientation events and Physics courses and procedures, which I hope you will find useful. Please read all of it carefully (yes, I know it is rather lengthy) and get back to me if you have any questions.

First a little background. The Physics graduate programs (http://www.rit.edu/cos/physics/) resides within the School of Physics and Astronomy (SoPA), in the College of Science. The programs include PhD and MS degrees in Physics and separately in Astronomy. As of Fall 2024, the Physics PhD Program includes 35 Graduate Program Faculty drawn from five departments with the majority from SoPA (17 faculty) as well as extended faculty from the School of Mathematical Sciences, the Center for Imaging Science, Chemical Engineering and Electrical and Microelectronic Engineering. We also have an open faculty position in atomic, molecular and optical physics that we expect to fill during the coming year. We are expecting an incoming class of 7 Physics PhD students and ~10 MS and BS/MS student. With your arrival, we anticipate that there will be over 75 graduate students enrolled in either the Physics or Astronomy PhD, MS or BS/MS programs in Fall 2024-25.

KEY CONTACTS

Physics Program Director:

Dr. Seth Hubbard
Engineering Hall (17), Room 2115
Phone: 585-475-4214
email: seth.hubbard@rit.edu

Physics Sr. Staff Assistant:

Cheryl Merrell
Office: Carlson Hall (76) 1260
Email: camsps@rit.edu
Tel: (585) 475-5302

KEY DATES

- International Student Orientation: mandatory online orientation, please see https://www.rit.edu/orientation/international
- RIT Graduate School Orientation: Thursday, August 22nd, 1PM – 3PM, Ingle Auditorium (there is also a virtual orientation, see https://www.rit.edu/orientation/graduate)
- Semester Kick-off Social, Thursday, August 22nd, 5PM – 6:30PM, SHED Atrium
- Physics departmental New Student Orientation Meeting (for MS and PhD): Wednesday, August 21st, 11 am – 12:30 pm, location TBD (Cheryl and I will announce by email).
- School of Physics & Astronomy Graduate Programs "mixer" lunch: Wednesday, August 21st, 12:30 – 2 pm, CAR-1275.
- Classes begin – Monday, August 26th, 2024.
- Last day of add/drop period – Tuesday, September 3rd, 2024.

The Institute Calendar for the 2023-24 academic year can be found here:

https://www.rit.edu/calendar/2425

ARRIVAL AND ORIENTATION

If you anticipate that you will be living in RIT accommodation, you should check your documentation for the move-in date.

Probably the first thing you should do when you arrive on campus is to visit the Registrar's office to complete the registration process and get your University ID card. Also, feel free to stop by my office in Engineering Hall (ENG; Building 17) room 2115. My office is in the section called the IT Collaboratory, down the hall from the cleanroom nanofabrication facility.

I am working to find desk space for any of you that need it. Typically, these would be in the first-year grad student office space Carlson Hall (CAR), although I realize some of you may already have space provided by your faculty mentor. ***If you anticipate needed desk space, can you please let me know as soon as possible?***

There will be a Physics New Student Orientation meeting on Wednesday August 21st at 11 am, followed by a joint lunch for all School of Physics and Astronomy graduate students (both Astronomy and Physics) and faculty in CAR-1275.

There will be an RIT Graduate School orientation meeting on Thursday, August 22nd, 1PM – 3PM in the Ingle Auditorium. This will introduce RIT and Graduate School resources. There is also a virtual orientation, which you are encouraged to complete. It can be accessed via this web page: https://www.rit.edu/orientation/graduate. In addition, the RIT Graduate School will hold a Kick-Off Social for all graduate students on Thursday, August 22nd, 5PM – 6:30PM in the SHED Atrium. Hors d'oeurvres will be provided at this networking event to meet representatives from graduate student groups and mingle with the RIT community.

The Graduate School will also be organizing Teaching Assistant Training courses at some point during the Fall Semester. More information about this will be circulated in due course, but you should plan to attend.

STIPENDS AND TA ASSIGNMENTS

If you are entering the PhD program, you will receive an RIT stipend during your first year, which in most cases will be in the form of a Graduate Teaching Assistantship (GTA) although some of you are receiving a Graduate Research Assistantship (GRA) directly from a faculty member.

For the GTA, this means that you are expected to work a minimum of 12 hours per week (including classroom time, preparation and grading) as a Teaching Assistant. Assignments will be made a week or so before the beginning of the Semester. Usually, you will be assisting a senior (Faculty) instructor in introductory undergraduate courses. Keep in mind that the process of allocating GTA/TA assignments sometimes spills over into the first week of classes, so don't be too concerned if you don't have your assignment by the end of Orientation Week.

PROGRAM REQUIREMENTS

To get a PhD in Physics, you will ultimately need to accumulate at least 60 semester credit hours, including a minimum of 24 course credits and 30 research credits.

You will need to complete the Graduate Seminar (a 2-semester sequence) and 4 of the 5 core courses: ***Mathematical Methods for Physics, Classical Electrodynamics I, Quantum Theory, Classical Mechanics and Statistical Physics***.

In addition to the core courses, you will choose a minimum of 4 (or more) elective courses. Your choice of courses will depend on your research interests and possibly also career aspirations and this is something you should discuss with your faculty mentor (see below).

Before you can advance to PhD candidacy, you will need to complete the PhD qualification process. All students must complete the four core courses with grades of B or better, as well as two semesters of graduate seminar. Core course grades below B must be remediated by taking and passing a comprehensive exam on the core course subject matter within 18 months of the initial course final exam.

Students must pass a qualifying examination, which consists of completing and defending a master's-level research project, prior to embarking on the dissertation research project. There is an option to write up and defend an MS thesis to earn an on-the-way Master's Degree, which also satisfies the qualifying requirements.

FACULTY MENTORS

You have been assigned to a Physics faculty mentor as indicated in your admission letter. The faculty mentor's task is to guide you through the first year in the program, or until such time as you team up with a research advisor. Your mentor (or mentors) will help you develop your plan of study, including course selection, choice of topic for your "master's level" research project etc.

It is important to note that your mentor does not necessarily have to become your eventual PhD research advisor (although this is certainly possible, and often happens). You are strongly encouraged to talk to as many different potential research advisors as possible, before deciding on a specific area for your research topic.

PEER MENTORS

In addition to your Faculty Mentor, you will be partnered with a more experienced student, who will generally be available to provide advice, inside knowledge, encouragement and moral support to help

you navigate the first year in the program. The idea is that you and your peer mentor will meet for an informal chat fairly regularly, maybe weekly, but how you arrange things is entirely up to you and your peer mentor.

FIRST-YEAR COURSES

A typical course load for each semester in year 1 consists of Graduate Seminar, two courses, including a core course and two credits of research, as listed below.

Fall:

PHYS-601 Graduate Physics Seminar I (1 credit)

Two of the following:

PHYS-610 Mathematical Methods for Physics (3 credit)

PHYS-611 Classical Electrodynamics I (3 credit)

PHYS-614 Quantum Theory (3 credit)

PHYS-790 Research & Thesis (2 credit)

Spring:

PHYS-602 Graduate Physics Seminar II (1 credit)

One of the following:

PHYS-630 Classical Mechanics (3 credit)

PHYS-640 Statistical Physics (3 credit)

Physics Elective (or closely related) (3 credit)

PHYS-790 Graduate Research & Thesis (2 credit)

If it makes sense in terms of your preparation and research plans, you may choose to replace the 2 research credits with an additional course. Any such adjustments must be agreed with your Faculty Mentor and the Program Director.

During the second year, you will take any remaining core and elective courses that have been mapped out in your Plan of Study (see below).

The planned course schedule for Fall should be available on the RIT Student Info System (see end of this letter for link).

In addition to the courses listed above you can also take as electives any relevant courses offered by other graduate programs at RIT, including Imaging Science, Engineering, Mathematics, Computer Science among others, that may be of interest to you.

COURSE REGISTRATION

We will automatically register you for Graduate Seminar I this Fall. In addition, you should choose two of your core courses from those that will be offered in Fall. Ideally, you will discuss this choice with your faculty mentor or me. Note that most 700-level courses have 600-level courses as co- or prerequisites. The 800-level courses are intended for year 2+ students and are not generally recommended for first years. If you wish to take a 700- or 800-level course, you should contact me to

request a waiver. **If you later change your mind about your course selection, you can change your enrolment at any time before the add/drop deadline (3 September)**.

From the Spring Semester 2025 onwards, you can register for courses online via the Student Information System (https://www.rit.edu/infocenter/), which you should be able to access using your RIT username and password. If you have trouble registering for any course, please contact Cheryl Merrell for assistance.

RESEARCH CREDIT

First-year students will normally take 2 research credits in each semester (PHYS-790). The purpose of this is to get you involved in a research project at an early stage. Your Faculty Mentor will usually supervise your project, but it is also possible to work with another faculty member, if that is appropriate. You should arrange to meet with your Faculty Mentor as soon as possible after arriving at RIT, in order to plan your research project.

Beyond the first year, students typically enroll in 2–4 research credits per semester, in order to satisfy the research credit requirement.

ESTABLISHING FULL TIME STATUS

You may need to fill out a Graduate Student Full Time equivalency form, to establish that you qualify as a full time student in that you have registered for at least 9 credit hours (course + research) for the semester. This is not usually necessary during years 1 and 2, when you are typically taking 2 classes, plus research credits, but it usually is necessary in years 3+, when you are taking only research credits.

If the total of course + research credits is less than 9, you may claim the balance as "Graduate Course Equivalent" credits if you are employed as a TA or RA. Note that these "equivalent credits" only count towards establishing full-time status, they do NOT count towards the MS or PhD requirements.

The form is available here: https://www.rit.edu/academicaffairs/registrar/forms.html

The Physics Staff Assistant, Cheryl Merrell will notify you when this form is due and will provide instructions for completing it.

TRANSFERRING CREDIT

If you have already taken graduate level courses in topics relevant to Physics, you may apply to transfer credit from those courses to Physics. If you have a Physics MS, it is likely that we will transfer some or all of the core course. You can also apply to count some of your MS courses toward your elective requirements. I will be sending you a separate individual email about your specific situation. If you believe you are eligible to transfer credits and you have not already discussed this with me, you should arrange to meet with me early during the Fall semester.

PLANS OF STUDY

During the Fall Semester of year 1, you will complete a Plan of Study, which maps out both the courses you will take and the semester-by-semester distribution of research credits, to meet the overall credit requirements for the degree. Your Plan of Study should be designed in consultation with your faculty mentor and submitted to me for approval. You will be asked to review and update your Plan annually.

COLLOQUIA, OTHER EVENTS

Participation in various events is an expectation for all students and for first years in particular.

- Physics Colloquia: Wednesday at 1:00 – 2:00 pm, location sent each week by email.

Attendance is required for Graduate Seminar students.

Other events (COS talks, social events, etc.) will be announced throughout the semester.

LAPTOPS

Most students prefer to use personal laptops, and when you get into research, any additional computing resources are generally provided by the student's research advisor.

PHYSICS STUDENT HANDBOOK AND OTHER PROGRAM INFORMATION

Much of the information contained in this letter, and more, can be found in the Physics Student Handbook. I am working to finalize this and should have it done before the semester starts or early in the Fall.

FURTHER INFORMATION

Here are some other links that may be useful.

- School of Physics and Astronomy: https://www.rit.edu/science/school-physics-and-astronomy
- RIT Student Info System: https://www.rit.edu/infocenter/
- College of Science: http://www.rit.edu/science/
- RIT Graduate School: https://www.rit.edu/graduateschool/
- International Student Services: http://www.rit.edu/studentaffairs/iss/
- RIT Policies & Procedures: http://www.rit.edu/academicaffairs/policiesmanual/

If you don't find what you are looking, feel free to ask me any questions.

We will do all we can to provide a safe, stimulating, supportive and friendly environment within which you can develop your skills as a research scientist.

Again, welcome – and good luck!

Dr. Seth Hubbard
Director RIT Physics PhD Program