

# Welcome

to the Graduate Program of the Department of Physics and Astronomy at:

The University of Texas at San Antonio!

The Department of Physics and Astronomy of the University of Texas at San Antonio provides opportunities for advanced studies and world-class research leading to the Master of Science degree in Physics.

The M.S. degree in Physics is awarded, by the University of Texas at San Antonio, to candidates who have 1) displayed an in-depth understanding of the subject matter and 2) demonstrated the ability to make a significant independent and original contribution to research in their field of specialty. This document describes the Policies and Procedures for the M.S. in Physics.

We hope that it provides you with helpful information. Much of the information included here can be found in the Graduate Catalog or the Physics & Astronomy website.

Please be sure to check with the Graduate Advisor regarding information about program-specific policies and procedures.

We hope that you have a rewarding experience and wish you success! Please keep checking the [Physics and Astronomy Department](#) website often. There you will find useful information, such as, forms, guidelines, contacts you will need throughout your academic career with our department at UTSA.

*On Behalf of the Faculty and Staff of Department of Physics and Astronomy!*

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## I. GRADUATE FACULTY IN THE PHYSICS M.S. PROGRAM

The Core Faculty members of the Physics M.S. program are divided into two campuses:

*The Department of Physics & Astronomy at the University of Texas at San Antonio*

Arturo Ayon, PhD	Katherine Mayer, PhD
Lorenzo Brancaleon, PhD	Kelly Nash, PhD
Andrey Chabanov, PhD	Christopher Packham, PhD
Chonglin Chen, PhD	Arturo Ponce Pedraza, PhD
Liao Y. Chen, PhD	Dhiraj Sardar, PhD
Zlatko Koinov, PhD	Eric Schlegel, PhD
Nicolas Large, PhD	David Silva, PhD
Xochitl Lopez-Lozano, PhD	Elizabeth Sooby-Wood, PhD
Marcelo Marucho, PhD	Angela Speck, PhD

*Southwest Research Institute, Division of Space Science and Engineering*

Frederic Allegrini, PhD  
Maher Dayeh, PhD  
Mihir Desai, PhD  
Robert Ebert, PhD  
Heather Elliot, PhD  
Stephen Fuselier, PhD  
George Gladstone, PhD  
Jerry Goldstein, PhD

Jörg-Micha Jahn, PhD  
Mark Libardoni, PhD  
Stefano Livi, PhD  
Ujjwal Raut, PhD  
Kurt Retherford, PhD  
Peter Roming, PhD  
Benjamin Teolis, PhD  
Jack H. Waite, PhD

*Affiliated Research Faculty*

Necip Guven, PhD (Texas Tech)  
Larry Tankersley, PhD

## II. ORGANIZATION & ADMINISTRATION OF MASTER'S PROGRAM

The Physics master's program is administered through the Graduate Studies Committee (GSC). The GSC is comprised of five core faculty members. The GSC elects its own chairperson, who is then appointed by the Department Chair to be the Graduate Advisor of Record (GAR) for the Physics M.S. program. The GSC reviews and recommends the academic policies and the degree requirements to the Graduate faculty.

The Graduate Advisor of Record (GAR) for the Physics M.S. program advises all master's students, supervises the maintenance of records, and represents the Physics and Astronomy Department as well as the Space Science and Engineering Division at SwRI in most matters relating to Physics master's students. Questions about degree requirements and academic policies should be directed to the Graduate Advisor of Record. Final authority for the Physics M.S. program rests with the Office of the Provost and Vice President for Academic Affairs.

## III. PHYSICS DEGREE REQUIREMENTS

### A. REGISTRATION

Rules recommended by the GSC and approved by the core faculty, the Department Chair, the Graduate Council and the Office of the Provost and Vice President for Academic Affairs govern the registration of the master's students. Students register for available classes through the [ASAP online](#) system. However, some courses require departmental approval. Students should register early enough in order to allow enough time to process the requests for those courses that require Departmental approval. Students should discuss selection of lecture courses with the Graduate Advisor of Record (GAR) or their Graduate Advisor, once this faculty member is selected. First year students are strongly encouraged to register for two of the core classes in the Fall semester and the remaining two core classes in the Spring semester.

**The Graduate Advisor of Record and the Graduate Advisor (once appointed) must approve the Program of Study (POS). Students are therefore encouraged to review the POS with their advisor and their comprehensive examination committee (CEC), periodically.**

## IV. COURSE REQUIREMENTS

### A. NON THESIS OPTION IN PHYSICS

#### **Degree Requirements**

This program requires the successful completion of a minimum of 30 semester credit hours. The coursework in the Program of Study includes a Core Curriculum (12 hours) and advanced electives (9 hours) which could include graduate courses taken in another program (e.g., chemistry, electrical engineering, etc.) upon approval of the CEC and/or the Graduate Advisor, or up to 6 hours of credit of undergraduate courses if the courses are appropriate for the student's program of study, if they were not taken as an undergraduate, and if they are approved by the Graduate Advisor of Record. Research hours include Research Seminar (3 hours), Directed Research\* (minimum of 6 hours). The choice of classes beyond the 12 hours of Core courses must be coordinated with the graduate advisor or the GAR.

### B. THESIS OPTION IN PHYSICS

#### **Degree Requirements**

The master's degree requires a minimum of 30 semester credit hours beyond the Baccalaureate Degree. The coursework in the Program of Study includes a Core Curriculum (12 hours) and advanced electives (6 hours) which could include graduate courses taken in another program (e.g., chemistry, electrical engineering, etc.) upon approval of the CEC and/or the Graduate Advisor, or up to 6 hours of credit of undergraduate courses if the courses are appropriate for the student's program of study, if they were not taken as an undergraduate, and if they are approved by the Graduate Advisor of Record. Research hours include Research Seminar (3 hours), Directed Research\* (minimum of 3 hours), and Master's Thesis (6 hours). Students must enroll in Master's Thesis each semester that they receive advice and assistance in writing the thesis until final approval of the completed thesis has been given and the thesis has been filed with the

Dean of the Graduate School. However, no more than 6 hours will count toward the M.S. degree. The choice of classes beyond the 12 hours of Core courses must be coordinated with the graduate advisor or the GAR.

## V. PROGRAM OF STUDY

The typical program of study for MS students is presented below.

Category	Semester Credit Hours
Non-Thesis option	Non-Thesis
Core courses (4)	12
Physics electives ( 3 )	9
Directed Research ( 2 )	6
Research Seminars	3

Category	Semester Credit Hours
Thesis option	Thesis
Core courses (4)	12
Physics electives ( 2 )	6
Master Thesis (2)	6
Directed Research	3
Research Seminar	3

## A. COURSES FOR MASTER'S PROGRAM

Core courses	12 SCH required
PHY 5103 – Classical Mechanics I	3 SCH
PHY 5203 – Electrodynamics I	3 SCH
PHY 5303 – Statistical Mechanics	3 SCH
PHY 5403 – Quantum Mechanics I	3 SCH

General Physics Electives	9 SCH required
PHY 6103 – Classical Mechanics II	3 SCH
PHY 6113 – Fluid Mechanics	3 SCH
PHY 6123 – Plasma Physics and Magnetohydrodynamics	3 SCH
PHY 6203 – Electrodynamics II	3 SCH
PHY 6303 – Quantum Mechanics II	3 SCH
PHY 6313 – Solid State Physics	3 SCH
PHY 6323 – Non-linear Optics and Lasers	3 SCH
PHY 6403 – Fundamentals of Space Physics	3 SCH
PHY 6413 – Fundamentals of Astronomy	3 SCH
PHY 6503 – Mathematical Physics I	3 SCH
PHY 6513 – Mathematical Physics II	3 SCH
PHY 6523 – Computational Physics	3 SCH
PHY 6613 – Methods of Experimental Physics	3 SCH
PHY 6623 - Space Physics Laboratory	3 SCH
PHY 7403 – Topics in Biophysics and Biomedical Physics	3 SCH – can be repeated for total of 6 SCH
PHY 7703 – Topics in Space Physics	3 SCH – can be repeated for total of 6 SCH

PHY 7803 – Topics in Theoretical Physics	3 SCH – can be repeated for total of 6 SCH
PHY 7973 – Special Topics in Physics	3 SCH – can be repeated for total of 6 SCH

<b>Research</b>	
PHY 7003 – Directed Research	3 SCH
PHY 6983 – Master’s Thesis	3 SCH
PHY 6961 - Comprehensive Examination	1 SCH (only if enrolled in no other classes)

## VI. RECOMMENDED SEQUENCE OF EVENTS FOR COMPLETION OF M.S.

### A. TYPICAL 2-YEAR PROGRAM OF STUDY FOR FULL-TIME STUDENTS – NON-THESIS MS

Year	Term	Program of Study
1	Fall	2 Core Courses + Research Seminars. (9 hrs)
	Spring	2 Core Course + 1 General Electives. (9 hrs)
2	Fall	2 General + 1 Directed Research (or Master’s Thesis) (9 hrs)
	Spring	1 Comprehensive Examination (3 hrs)

The final Program of Study must be approved by the student’s, Graduate Advisor, and submitted via the Department Chair to the Dean of the Graduate School. Students should periodically (at least once a year) review the POS with their advisor and, once it is formed, with their comprehensive examination committee.

The satisfactory progress of each student is followed by the advisor and the comprehensive examination committee, but also by the Chair of the Doctoral Studies Committee through annual audits that are requested by the annual progress report each August. If a student fails to make good progress, the student’s advisor as well as the student will be required to meet with the chair of the GSC and/or the Chair of the Department.

## VII. SEMINAR

### A. SEMINAR REQUIREMENTS

In order to promote general awareness of research activities and to share ideas between members of the Physics program, all students and faculty are expected to regularly attend Physics graduate program functions. Annual attendance is required at the following:

1. Physics Orientation.
2. Physics Seminar Series – every seminar given.

Since the level of students’ M.S. activity is mostly based on their research proficiency, all students are expected to attend as many seminars as possible beyond the required Research Seminar class that is taken for credits.

### B. SEMINAR CREDIT REQUIREMENTS

The Research Seminar course (PHY 7013) is a 3-hour course and the credit hours are earned in the semester when the student officially enrolls for the class. However, in order to receive full credit a student must attend at least three semesters of PHY 7013. For example, a student could sign up in semester one, but is required to attend the seminars for at least two consecutive semesters after that. Failure to do so will result in an “incomplete” grade or an “F” grade which would prevent graduation of the student or cause dismissal from the program, respectively.

## VIII. INDEPENDENT STUDY

Up to six hours of independent study are allowed and can be used in place of Advanced Elective courses. However, the recommendation is to limit the number of coursework taken as independent study to a minimum. Students based at UT Brownsville cannot use this mechanism to avoid the minimum number of credit hours required to be taken from courses taught by UTSA core faculty.

## IX. SELECTING A GRADUATE ADVISOR

This is the most important decision taken by any student in the program. During the first semester of residence, students have the opportunity to attend an introductory orientation to learn about research opportunities in individual faculty groups. In addition, students are urged to meet with individual faculty to discuss research interests as early as the first semester. By the end of the first summer in the program or at the very latest by December of the second year, every student should have identified a faculty member who is willing to advise the student and to supervise research for the dissertation. In order to make appropriate progress toward completion of the M.S., it is important that the student initiates directed research as soon as possible, no later than the middle of the second year.

A student must submit to the Graduate Advisor of Record the [MS1 form](#) selecting a Graduate Advisor with the signed consent of that faculty member. **All students are expected to have selected the advisor and formed the Examination committee before the end of the first year.** If extenuating circumstances have prevented a student from arranging a Graduate Advisor by that time, the student can petition the GSC for up to a maximum of one semester additional time. **A student who is not awarded additional time, or who has not been approved for a Graduate Advisor following completion of the additional time will not be allowed to continue in the M.S. program.**

## X. ATTENDANCE REQUIREMENT

Students must attend classes as required. If a student cannot attend classes or fulfill research commitments and does not notify the Chair of the GSC, then their stipend may be suspended, and procedures will begin to ascertain whether or not the student should be dismissed from the MS Program.

### A. LEAVE OF ABSENCE:

Continuous registration as a doctoral student is required unless a formal leave of absence is granted by the Dean of the college in which the student's program is administered. A leave of absence may be granted for military duty or medical reasons. A leave of absence may be granted for other reasons if additional approval is obtained by the Vice Provost and Dean of the Graduate School. No degree examinations may be taken while a student is on a leave of absence. If the student has not yet advanced to candidacy for the doctoral degree, this request must be approved in advance of the leave by the graduate advisor. If the student has advanced to candidacy, the application must be approved in advance by the graduate advisor and the graduate associate dean of the college and dean of the graduate school. A leave of absence is required for Fall and Spring semesters (and/or Summer if doctoral program mandates Summer enrollment). Under no circumstances may a leave of absence be applied retroactively.

**A leave of absence will prevent the student from receiving student funding from their program and may affect ability to receive financial aid or loans and/or to defer payments on loans.** Students should contact the Office of Financial Aid with questions regarding financial aid or loan status.

A student returning from a leave of absence must enroll for the following Fall or Spring semester or provide a written request for an extension of the leave of absence (a leave of absence may not exceed one year throughout the student's degree program). A student without an approved leave of absence who fails to register each semester will be considered to have withdrawn from candidacy for the degree. Approval of a Petition for Reinstatement will be required for reinstatement. For more information, visit the [graduate school website](#).

## **B. ENROLLMENT:**

Students who receive support as Teaching Assistants or through most other forms of grants and support MUST be enrolled full-time. To fulfill this requirement a student must be enrolled for a minimum of 9 credit hours in each long semester and a minimum of 3 credit hours in the summer semester.

International students must be enrolled full-time throughout the course of study in order to maintain eligibility for their student visa status.

Students have a one-time option to petition to remain full time students at a reduced course load. This can be applied only once and for only one semester.

Students who do not receive financial support, typically, are not required to remain enrolled as full-time students.

## **XI. GENERAL ACADEMIC REGULATIONS**

Rules concerning registration, late registration, adding classes, dropping classes, and auditing classes are all found in the schedule of classes. Academic standing, cancellation of enrollment, withdrawal procedures, reinstatement in the University and student classification are also addressed in the Graduate catalog.

### **A. GRADE POINT AVERAGE**

To remain in good academic standing a minimum grade point average of 3.0 (on a 4.0 scale) must be maintained in each of the following:

1. all coursework completed at UTSA
2. graduate courses in the student's major
3. graduate courses in the student's support field.

In computing grade point averages, grades from other institutions are not used.

### **B. ACADEMIC PROBATION AND DISMISSAL**

#### ***Academic Probation***

Academic probation describes the standing of a student at the graduate level who is in one of the following categories:

1. A student who fails to achieve a grade point average in any term at UTSA of 3.0 or higher, irrespective of level of courses taken.
2. A student who received a grade of "D" in any course in a term.
3. A student who does not meet all requirements for unconditional or regular admission and who, by special action, is admitted on academic probation.
4. A student who has been reinstated following academic dismissal.
5. To graduate, all graduate students must have a grade point average of at least a 3.0 (on a 4.0 scale).

Academic probation is cleared only when none of the above criteria apply and when the student achieves an overall grade point average of 3.0 as a graduate student at UTSA. Students on academic probation are encouraged to discuss their status with their academic advisors.

**Important!! A student on academic probation cannot be supported as a Teaching Assistant or as a Graduate Research Assistant.**

#### ***Academic Dismissal***

Academic dismissal occurs:

1. when a student at the graduate level earns a grade point average of less than 2.0 in any term
2. when a student at the graduate level earns a grade of "F" in any course
3. when a student at the graduate level is admitted on probation with conditions and fails to meet a condition
4. when a student at the graduate level who is on academic probation during a term would again be placed on academic probation under the provisions of academic probation set forth above in the subsequent term. If, however, the student's UTSA grade point average for the term is at least 3.0, the student will continue on academic probation.

**Important!! A student on academic dismissal cannot be supported as a Teaching Assistant or as a Graduate Research Assistant.**

## **XII. ORGANIZATION & ADMINISTRATION OF MASTERS PROGRAM**

**RECOMMENDED SEQUENCE OF EVENTS FOR COMPLETION OF THE M.S. DEGREE REQUIREMENTS.** The following sequence summarizes some of the landmarks of progress that should be followed as closely as possible.

### **SEMESTER 1**

1. Arrival at UTSA- Meet with graduate program Advisor (i.e. GAR)
2. Prepare and submit a Preliminary Program of Study with the GAR
3. Complete requirements for unconditional admission (if necessary)
  - A) BS in Physics or at least 18 undergraduate hours in upper-division physics courses (the catalog says 18 hours, at least 12 being upper-division)
  - B) 550 on TOEFL, if not native English language
  - C) Satisfactory score on the basic GRE (subject Physics GRE-highly recommend)
  - D) Three letters from qualified professionals
  - E) 3.0 GPA in last 60 credit hours earned

### **SEMESTER 2**

4. Select research advisor & consult about Program of Study
5. Form Supervisory Committee: Comprehensive Exam -3 members, including a majority of tenured or Adjoint tenure-track faculty from the Core faculty of Physics & SwRI.

### **SEMESTER 3**

6. Complete the majority of course work

### **SEMESTER 4**

7. Schedule, take and pass Comprehensive Examination, administered by Supervisory Committee
8. Apply for Graduation

## **XIII.MASTER'S DEGREE**

All candidates for the M.S. degree in Physics must satisfy the university-wide master's requirements. To qualify for the M.S. degree in Physics, the M.S. candidate is required to take a minimum of 30 semester credit hours in coursework approved by the Graduate Program Committee (exclusive of coursework or other study required to remove deficiencies) and be enrolled in a Master's Thesis course the semester of graduation.

There is no University stipend support for Master's Degree students. Positions as Teaching Assistants or Research Assistants *may* be available for (salary only) support.

A candidate for the master's degree must, in addition to other requirements, pass a comprehensive examination comprised of oral and written components. The comprehensive examination will be administered by the Comprehensive Exam Committee. The Comprehensive Exam depends on the choice of option by the student.

**A. NON-THESIS OPTION**

For a MS degree under the Non-Thesis Option, a student can meet requirements without defending a thesis. Instead, the student is required to complete 30 Semester credit hours of formal graduate coursework approved by the Graduate Program Committee. A student who selects the non-thesis option is still required to enroll in 6 credit hours of Directed Research. In this case the Directed Research course can be taken twice with the same faculty or with a different faculty for each of the three credit hours. **The Comprehensive Examination is constituted by a written report that describes the activity and results obtained in the Directed research classes as well as the understanding of the research topic.** The written report is then followed by a seminar presentation of the research activity carried out during the Directed Research hours.

In order to successfully defend the Comprehensive Examination a student must:

- a. Prior to the exam, student should complete and interim program of study ([Form MS1](#)).
- b. Select a Comprehensive Examination chair. This is typically selected among the faculty with whom the student enrolled for the Directed Research course.
- c. In consultation with the faculty, the student then assembles a Comprehensive Examination Committee which includes a minimum of three members. The absolute majority of the members of the committee MUST be composed of core (or Adjoint) faculty members. At least one member of the committee MUST be a non-Adjoint faculty of the Physics Department at UTSA. Student must complete the appointment of the advisor and comprehensive exam committee form after consultation with advisor and in the semester before defending ([Form MS2](#)).
- d. Provide the report to the committee, at least a week prior to the defense. After providing the report the student in consultation with the committee members selects a date for the defense.
- e. The defense is typically made in front of only the committee members (but general public is allowed to participate) and consist of a seminar where the student discusses and demonstrates sufficient understanding of the research and topic investigated during the Directed Research hours.
- f. The student will submit completion and program of study forms to the program manager.
  - MS3- [Report of Comprehensive Examination for the Master's Degree](#)
  - MS4- [Completion of Comprehensive Examination](#)
  - MS5- [Program of Study for the Master's Degree](#)

**B. THESIS OPTION**

For a MS degree under the Thesis Option, a student must defend a thesis. The student is required to complete 30 Semester credit hours of formal graduate coursework approved by the Graduate Program Committee. A student carries out research for the obtainment of a MS Thesis. Instead of enrolling in Directed Research, students who select the Thesis Option can enroll in either 3 credit hours of Directed Research or 3 hours of Master's Thesis and, in the semester in which they defend, enroll in Comprehensive Exam. The Comprehensive Examination is constituted by the thesis itself and by the thesis defense.

In order to successfully defend the Comprehensive Examination a student must:

- a. Prior to the exam, student should complete and interim program of study ([Form MS1](#)).
- b. Select a Comprehensive (or MS Thesis) Examination chair. This is typically the faculty with whom the student enrolled for research.
- c. In consultation with the faculty, the student then assembles a Comprehensive (or MS Thesis) Examination Committee which includes a minimum of three members. The absolute majority of the members of the committee MUST be composed of core (or Adjoint) faculty members. At least one member of the committee MUST be a non-Adjoint faculty of the Physics Department at UTSA. Student must complete the appointment of the advisor and comprehensive exam committee form after consultation with advisor and in the semester before defending ([Form MS2](#)).
- d. Provide the thesis to the committee at least three weeks prior to the defense. After providing the thesis the student in consultation with the committee members selects a date for the defense.
- e. The defense is typically made in front of only the committee members (but general public is allowed to participate) and consist of a seminar where the student discusses and demonstrates sufficient understanding of the

research carried out.

g. The student will submit completion and program of study forms to the program manager.

MS3- [Completion of Oral Examination](#)

MS4- [Certification of Completion of Thesis Requirements for Master's Degree](#)

MS5- [Program of Study for the Master's Degree](#)

#### **XIV. GRIEVANCE PROCESS**

Students who wish to discuss problems, concerns or file a formal grievance in regards to academics or research matters, should in general follow this line of contacts:

1. Dissertation Advisor  
↓
2. Program Manager  
↓
3. Graduate Advisor of Record  
↓
4. Associate Chair of the Department  
↓
5. Chair of the Department  
↓
6. Associate Dean for Graduate Studies (College of Sciences)

In case the complaints or grievance is in regard to one of the individuals listed above the students should contact the subsequent person in the list.