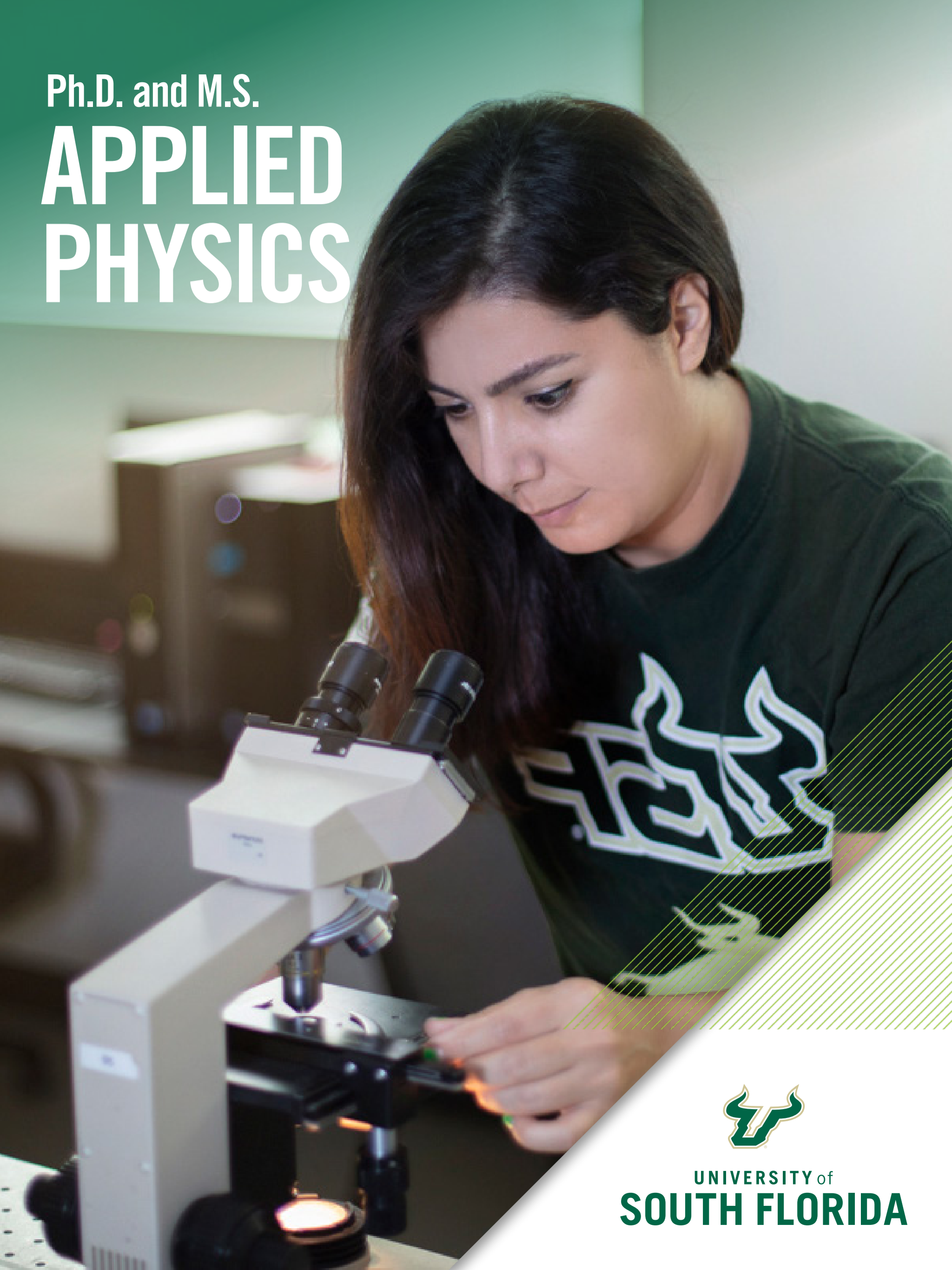


Ph.D. and M.S.  
**APPLIED  
PHYSICS**



UNIVERSITY of  
**SOUTH FLORIDA**

# APPLIED PHYSICS

The University of South Florida (USF) is the only university in the state of Florida that offers a Ph.D. in Applied Physics.

College of Arts & Sciences | Department of Physics

**A**ppplied physics provides the bridge between theoretical, fundamental physical concepts and their practical, engineering applications.

Three integrated components serve this mission:

## RESEARCH FOCUS

Our emphasis is on solid-state & materials physics, biophysics and medical physics, atomic, molecular physics and optics, and computational physics.

## TAILORED COURSE WORK

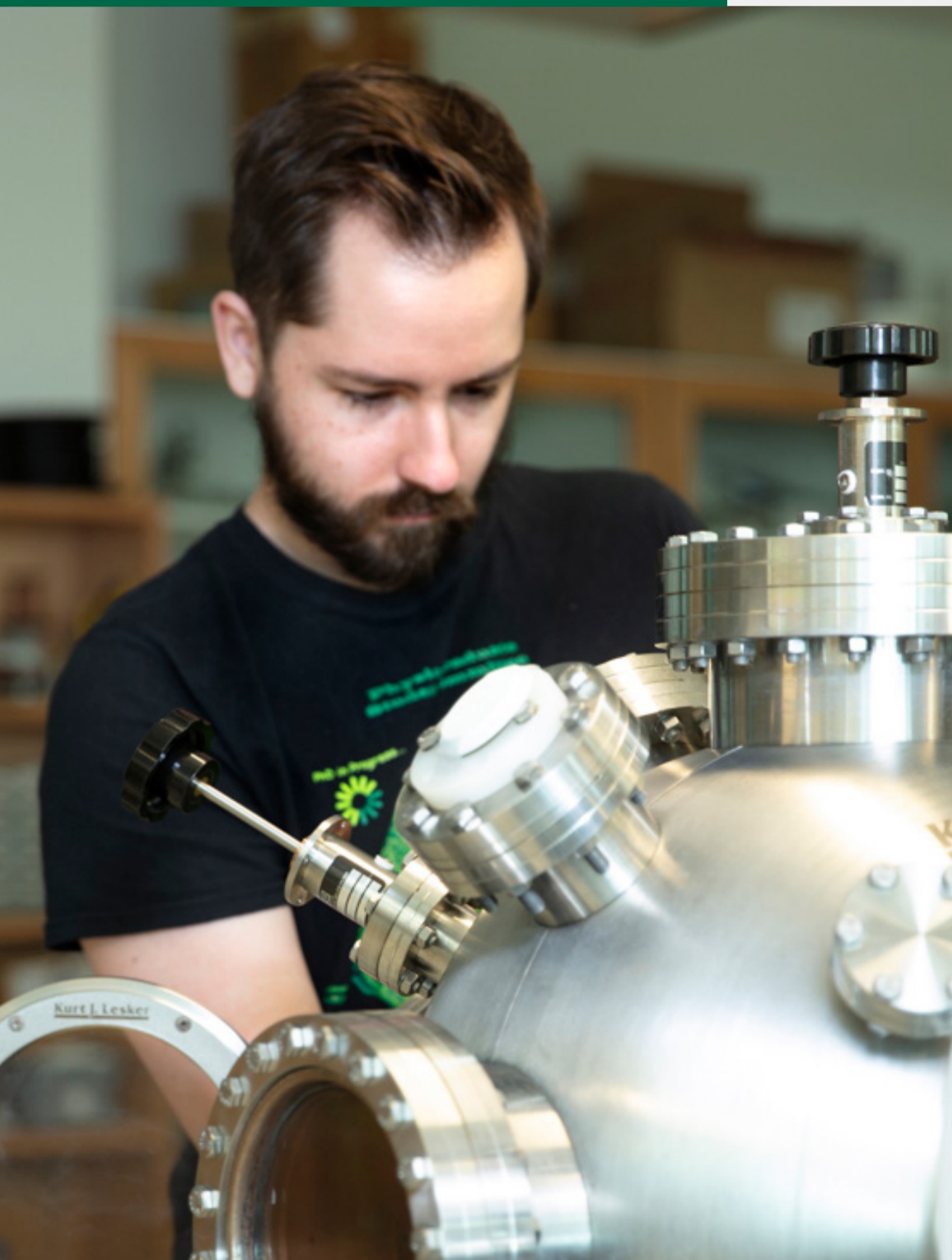
Research specific, customizable, small classes.

## INDUSTRIAL PRACTICUM

All students have the unique opportunity to spend 2 - 12 weeks in national companies or labs.

## Graduation Placement

More than 95% placement since the program was established in 1999. Diverse profile expanded from traditional physicist to entrepreneur and healthcare specialist. Our alumni are employed nationally and globally.





# YOUR FUTURE



## A New Era Begins as USF Achieves Preeminence

The Florida Preeminence Program rewards high-achieving universities based on 12 metrics, including graduation rates, student retention rates, research expenditures, and the number of patents awarded. USF is just the third Florida university to earn preeminence, joining the University of Florida and Florida State University - a remarkable achievement for a university that's half the age of its peers.

### SOME HIGHLIGHTS

- In 2023, USF became the first public university in Florida in nearly 40 years to be invited to join the Association of American Universities, a prestigious group of the leading universities in the United States and Canada.
- USF has been named America's Fastest Rising Research University 2020.
- It is classified as "R1: Doctoral Universities – very high research activity" (only 2.5% of all post-secondary institutions.)
- The physics department has 25 tenure-line research faculty and 65 graduate students.
- The American Physical Society (APS) has chosen to fund USF Physics as one of two inaugural Bridge Program sites in the nation. The program makes a significant contribution to the inclusion of under-represented minorities in graduate physics education, a pressing national need.



# OUR GRADUATE PROGRAMS

- M.S. in Applied Physics
- Ph.D. in Applied Physics
- Ph.D. in Applied Physics with Emphasis on Medical Physics

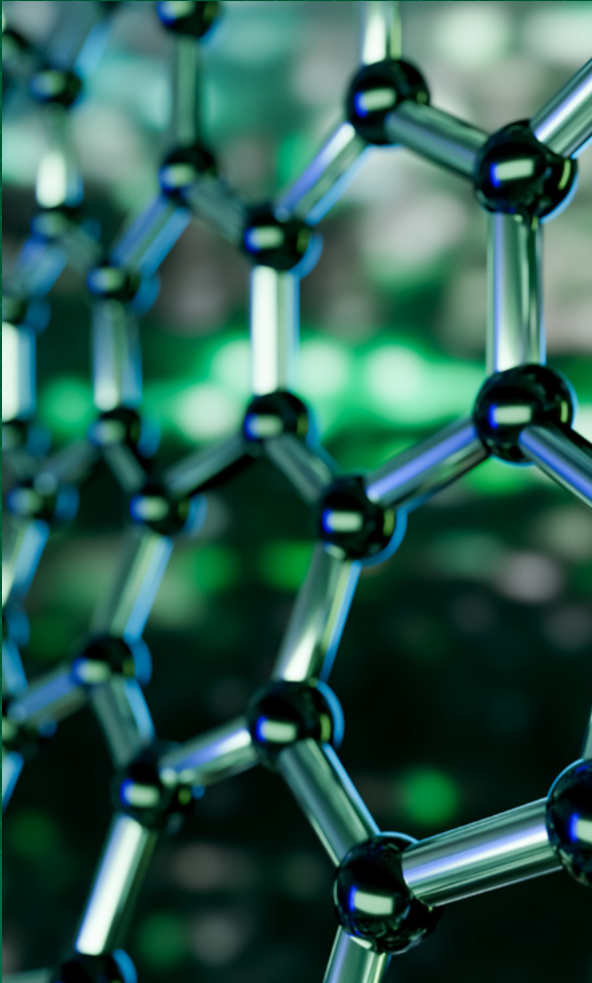


“ I FELT VERY WELCOME IN THE PROGRAM. PROFESSORS, FELLOW-STUDENTS, AND STAFF ARE ALL FOCUSED ON THE STUDENTS' SUCCESS AND CREATE COLLABORATIVE, FRIENDLY, AND ACADEMICS-ORIENTED ATMOSPHERE.”

These programs encompass the research areas of Biophysics & Biomedical Physics, Atomic Molecular & Optical Physics, Solid State & Materials Physics, and Medical Physics, in collaborative research with USF Moffitt Cancer Center.

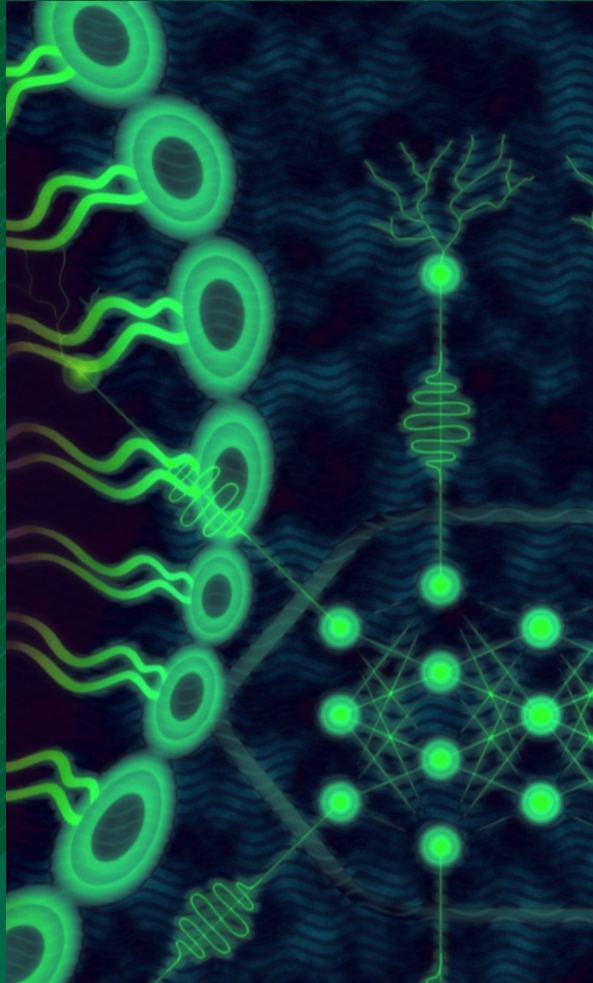






## SOLID STATE & MATERIALS PHYSICS

Basic and applied research in Solid-state and Materials Physics at the University of South Florida aims to improve the understanding of physical phenomena and to develop advanced materials and processes for technologically significant applications. The range of topical areas of interest include new crystal growth and synthetic approaches, thermal transport, phonon-scattering mechanisms, surface and interface phenomena, quantum and electron correlation effects in low dimensional materials, fundamentals of catalytic conversion at surfaces, epitaxy, thin films and heterostructures, nanomagnetism, nanospintronics, biosensors, medical nanodevices, magnetocaloric materials, functional magnetic oxides, multiferroic materials, atomically thin heterostructures, spin frustration in strongly correlated materials, spin dynamics at GHz & THz frequencies, unconventional magnetism at molecular interfaces, fabrication and characterization of 2D materials for applications in optoelectronic devices, photosensors, ferroelectric and thermoelectric materials, multiferroics, superconductors, electronic structure simulations, thermoelectric transport, models for Hall effects, topological materials, photovoltaic materials and non-linear optical materials.



## BIOPHYSICS & BIOMEDICAL PHYSICS

Physics cluster in our department is engaged in a wide range of basic and applied research projects. Research interests include lipid-protein interactions, biomolecular simulation techniques, machine learning, polypeptide induced membrane transformation, phase separation in model membranes, neuronal disorders, calcium dynamics, and cell signaling pathways.

## ATOMIC MOLECULAR & OPTICAL PHYSICS

Atomic, molecular and optical physics is pursued within the Department of Physics and covers a wide range of theoretical and experimental research in low energy studies of atomic and molecular materials often using laser, optical, phonon, and electrical excitation and subsequent spectroscopic analysis of the resultant response, optoelectronic properties and device physics of low dimensional and solution based semiconductors, spin photocurrent from two dimensional flexible multiple quantum wells.



## MEDICAL PHYSICS

Medical Physics is the application of physics and related sciences to the practice of medicine. Our Ph.D. program in Applied Physics Emphasis in Medical Physics with the H. Lee Moffitt Cancer Center and Research Institute has been accredited by the Commission on Accreditation of Medical Physics Education Programs (CAMPEP). This will provide a national point of distinction for our Applied Physics doctoral program and generate opportunities for our graduates in this option to pursue clinical residencies in radiation oncology physics and achieve board certification in medical physics.

# RESEARCH AREAS



# WHY CHOOSE APPLIED PHYSICS AT USF?



- Unique Applied Physics program
- Ranked among top US programs for student criteria (NRC)
- High graduation rate and graduation placement (>95%)
- Average graduation time 5.5 years (a year ahead of the national average)
- Multidisciplinary research
- Comprehensive financial assistance (competitive stipend+ tuition waiver+ health insurance)
- Tailored course work
- Industrial practicum
- USF is one of only three Preeminent State Research University in Florida
- Located in the beautiful Tampa Bay area



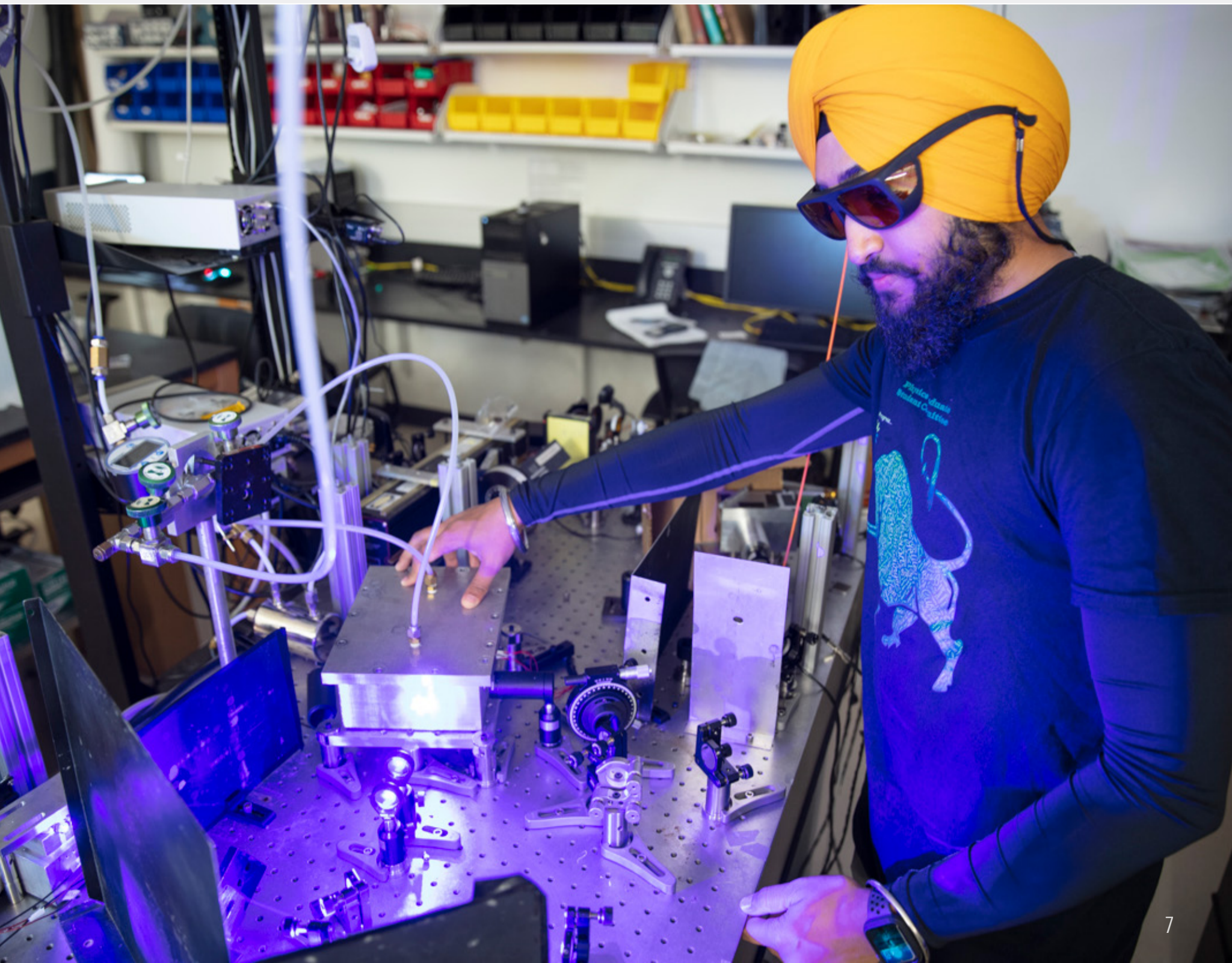
# START HERE

## ADMISSION REQUIREMENTS

- Bachelor's Degree in Physics or a related field with a minimum undergraduate GPA of 3.0 out of 4 (letter grade of B)
- General GRE (Graduate Record Exam) is required. GRE Physics Subject Test is recommended. GRE can be waived for exceptional applicants
- 3 letters of recommendation
- Statement of Purpose
- Students from non-english speaking countries are required to take either TOEFL (IBT>80), or IELTS (>6.5)

## FINANCIAL SUPPORT

- Teaching & Research Assistantships are usually limited to Ph.D. students
- For non-english speaking countries TOEFL speaking (>20), or IELTS speaking (>7.0) is required
- Stipend: \$28,832/year + Tuition Waiver & Health Insurance
- Presidential Fellowships (for exceptional Ph.D. Students)  
Stipend: \$34,000/year + tuition waiver (five-year award)
- Other USF and Summer Fellowships





# PROGRAM CURRICULUM

## PH.D. DEGREE REQUIREMENTS

The degree requires a total of 72 credit hours distributed as follows:

Core Courses in Theoretical and Applied areas (12 credit hours)

Electives (18 credit hours)

Additional Credit Hours (15 credit hours)

Industrial Practicum (3 credit hours)

Dissertation Research (24 credit hours)

The curriculum for the Applied Physics program has been developed with the premise that the students need to acquire a strong theoretical background in advanced physical concepts first and then apply this knowledge to technical challenges. In collaboration with the USF Moffitt Cancer Center, our graduate program also offers a separate PhD in Applied Physics with concentration in Medical Physics

## M.S. DEGREE REQUIREMENTS

The MS degree requires 30 credit hours and offers a thesis and non-thesis option. Both options involve completion of three core courses (9 credit hours). The average time to complete the MS degree is 3 years, with 5 years the maximum.

### THESIS OPTION

Electives (12 credit hours)

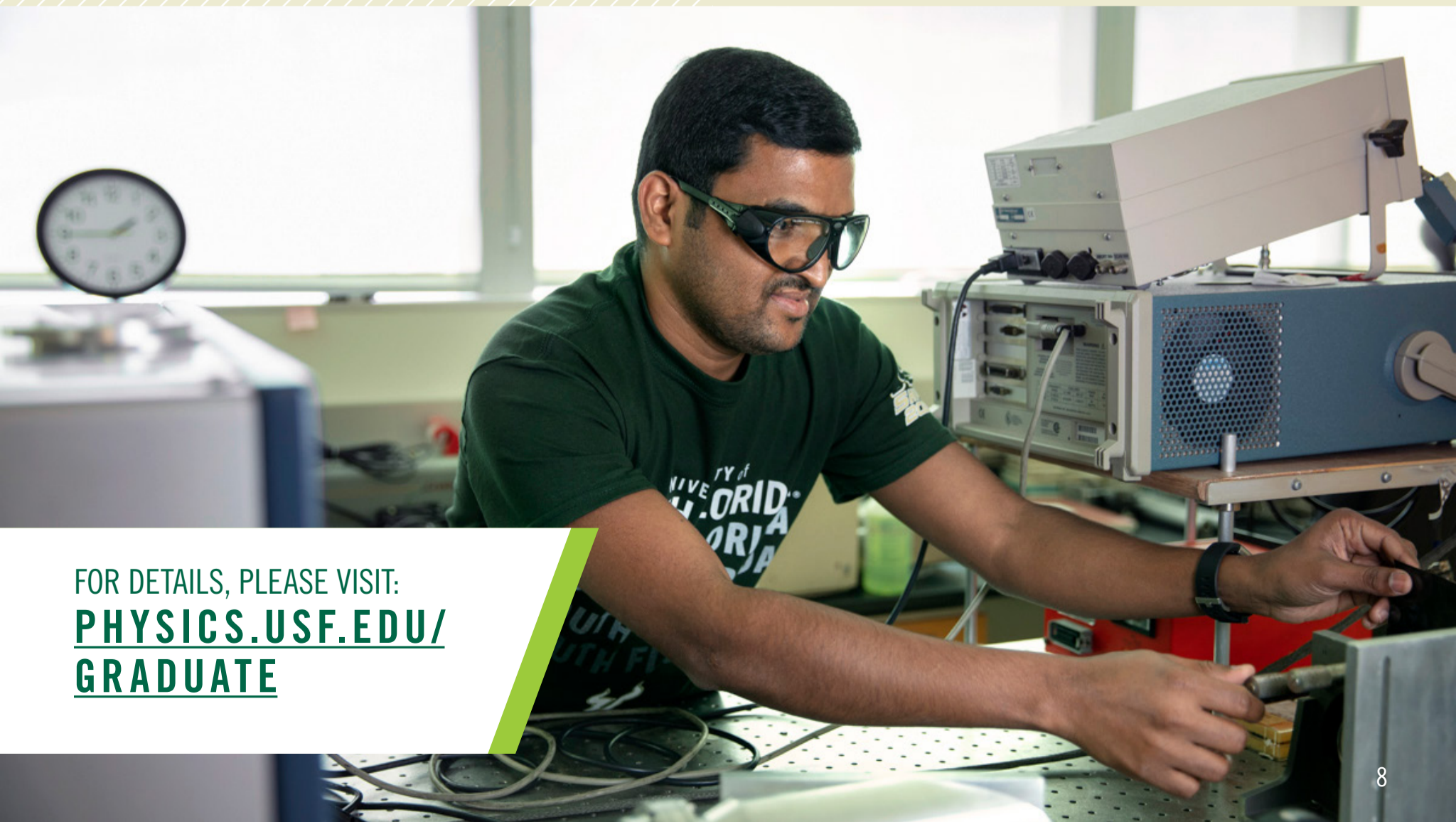
Thesis research (9 credit hours)

### NON-THESIS

Electives (21 credit hours)

	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	YEAR 6
COURSES	4 CORE COURSES, 2 ELECTIVES	4 ELECTIVES, DIRECTED RESEARCH				
RESEARCH	JOIN LAB	START RESEARCH TOWARDS PhD				
INDUSTRIAL PRACTICUM				INDUSTRIAL OR CLINICAL PRACTICUM		
EXAM			CREDENTIALS CHECK	CANDIDACY	DEFENSE AND GRADUATION	

FOR DETAILS, PLEASE VISIT:  
[PHYSICS.USF.EDU/  
 GRADUATE](https://physics.usf.edu/graduate)





# INDUSTRIAL PRACTICUM



**NATIONAL:** Tucson (AZ) | Silicon Valley, Berkeley, Livermore, Redondo Beach (CA) | Rogers (CT) | Washington (DC) | Largo, Tampa, St. Petersburg, Tallahassee, Dunedin, Alachua, Gainesville, Apopka (FL) | Kolkata (IN) | Baton Rouge (LA) | Shrewsbury, Andover (MA) | Adolphi, Rockville, Gaithersburg, Columbia, Gaithersburg, Aberdeen Proving Ground (MD) | Bay City (MI) | Bloomington (MN) | Durham (NC) | Hopewell (NJ) | Los Alamos, Albuquerque (NM) | Troy, Upton (NY) | Oak Ridge (TN) | Dallas (TX) | Falls Church (VA)

**INTERNATIONAL:** Vienna (AS) | China (CH) | Dresden (DE) | Dresden (GY) | Bruyeres-le-Chatel, Gif-sur-Yvette, Orsay, Lyon (FR) | Tel Aviv (IS) | Trieste (IT) | Totsukamachi, Shinjuku (JP) | Kosice (SL) | Faversham (UK) | Hanoi (VM)

The Industrial Practicum is a unique feature of our Ph.D. program. It is designed to give our Ph.D. candidates the opportunity to apply their knowledge in a nonacademic environment, develop relationship with potential future employers, and enhance their career opportunities. PhD students may complete the Industrial Practicum requirement at any national or international industrial firm, company, private agency or government/state research laboratory. Industrial Practicum may last from four weeks to one semester, and is funded by the department funds or research grants.



# BULL CITY



## STUDENT ORGANIZATIONS

Graduate students are active in the life of the department, some might say that they are the life of the department, through the Physics Graduate Student Committee and the Society of Physics Students. USF grad students organized the Tampa-Orlando chapter of APS local links, a forum sponsored by the American Physical Society for local physicists in academia and industry to get together monthly at coffee houses or pubs. Students also organize holiday parties, movie nights, departmental picnics, and physics demonstrations for middle and high school students.

## LIFE IN TAMPA BAY

A thriving business community, vibrant arts scene and intriguing historic districts make Tampa Bay a desirable place to live. From the Salvador Dali museum to the thrills of Busch Gardens theme park, there are attractions, sports venues, performance halls museums, theaters, shopping locations and restaurants galore to explore. Tampa is easily accessible. Tampa International Airport, which is consistently voted one of the best in the world, is just 14 miles from USF Tampa Campus.

## FOR MORE INFORMATION

About admissions, please contact:

**Prof. Inna Ponomareva**  
Director of Graduate Admissions  
[phyadmissions@usf.edu](mailto:phyadmissions@usf.edu)



UNIVERSITY of  
**SOUTH FLORIDA**

**Department of Physics**  
4202 Fowler Ave, ISA2019, Tampa, FL 33620  
Phone: (813) 974-2871

[physics.usf.edu](http://physics.usf.edu)