

*APPLIED PHYSICS  
AT THE UNIVERSITY OF SOUTH FLORIDA*



*Innovative Research +  
Multidisciplinary Education =*

*Career Success*

*Making Quantum Leaps*



## Applied Physics at the University of South Florida

The University of South Florida (USF) is the only university in the state of Florida that offers a PhD in Applied Physics. Applied physics provides the bridge between theoretical, fundamental physical concepts and their practical, engineering applications. Our emphases on materials physics, biomedical physics, and environmental physics, with laser physics, computational physics, and imaging science as enabling technologies, are responsive to these needs. This mission is served by a diverse faculty with expertise in theoretical and applied physics. Accordingly, faculty members are drawn from a number of science and engineering fields, including, but not limited to, Biophysics and Physiology, Physics, Applied Physics, Chemical Physics, and Electrical Engineering. Currently we have 25 tenure-line faculty, 3 research faculty and 5 full-time instructors, with 11 affiliated faculty from College of Medicine, College of Engineering and Moffitt Cancer Center.

### Our Graduate Programs

In addition to the traditional **M.S. and Ph.D. in Applied Physics**, our graduate program also offers a **PhD in Applied Physics with Medical Physics Concentration**, in collaborative research with USF Moffitt Cancer Center. These programs encompass the research areas of Biophysics & Biomedical Physics, Atomic Molecular & Optical Physics, Solid State & Materials Physics, and Medical Physics.

The American Physical Society (APS) has chosen to fund USF Physics as one of two inaugural Bridge Program sites in the nation. USF and the other site, Ohio State, join the four existing self-supported bridge programs in physics: MIT, Columbia, Michigan, and Vanderbilt.

The program will allow us to make a significant contribution to the inclusion of under-represented minorities in graduate physics education, a pressing national need. By participating in the APS Bridge Program under the guidance of caring faculty mentors, students will develop a solid academic background, research skills, and one-on-one mentoring relationships critical for successfully transitioning to a PhD program.



### Points of Pride

- ❑ USF is one of the only three preeminent universities in the State of Florida.
- ❑ USF was awarded \$505.9 million in research contracts and grants in fiscal year 2017-2018.
- ❑ USF ranked 15<sup>th</sup> world-wide for granted U.S patents among all universities according to the Intellectual Property Owners Association.
- ❑ USF is one of four Florida public universities classified by the Carnegie Foundation for the Advancement of Teaching in the top tier of research universities (RU/VH), a distinction attained by only 2.3 percent of all universities.
- ❑ The *Chronicle of Higher Education* ranked USF as the fifth fastest growing research university in the U.S.
- ❑ USF was one of only five institutions to receive NAFSA's 2013 Senator Paul Simon Award for Comprehensive Internationalization.
- ❑ USF was ranked 1<sup>st</sup> among the country's most veteran-friendly schools by *Military Times: Best for Vets: Colleges 2015 rankings*.

## 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 limited to PhD students
- ❑ Stipend: \$21,562/year + tuition waiver & Health Insurance
- ❑ Presidential Fellowships (for exceptional Ph.D. Students). Stipend: 25,000/year + tuition waiver (five-year award)
- ❑ Summer Research Fellowships. 5,000 (8 awards per year)



## Program Curriculum

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. Our graduate program also offers a PhD in Applied Physics with an emphasis in Medical Physics, in collaborative research with USF Moffitt Cancer Center.

### PhD Degree Requirements

The degree requires a total of 57 credit hours distributed as follows:

Core courses in theoretical and applied areas- 15

Lab or computer training- 3

Electives- 12

Industrial Practicum-3

Dissertation Research-24

For details, please visit: <http://physics.usf.edu/graduate/>

### MS Degree Requirements

There are two options in this degree program. All two requires completion of five course courses (15 credit hours). The average time to complete MS degree is 3 years, with 5 years the maximum.

#### *Thesis option:*

Electives-12

Thesis research- 6

#### *Non-thesis option:*

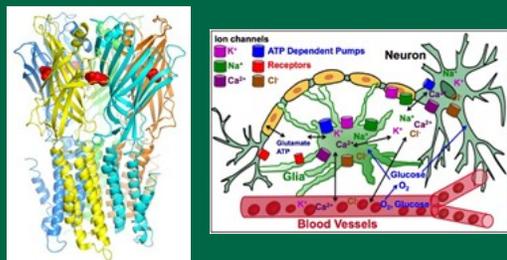
Electives-15

## Roadmap of PhD

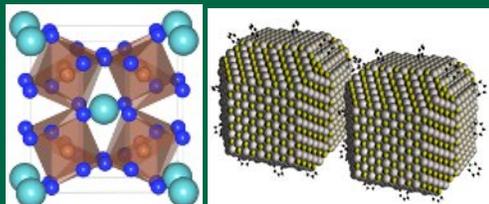
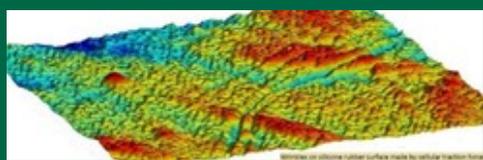
Task	Year	Year 1	Year 2	Year 3	Year 4	Year 5-7
Courses		5 Core courses+ 1 Elective	Comp/courses+ 3 Elective			
Research		Join a lab		Full research		
Events		GRE Sub	Qualification EX		Candidacy EX	Industry Practicum

# Research Areas

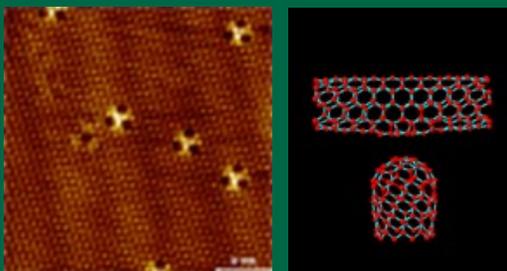
## Biophysics & Biomedical Physics



## Atomic Molecular & Optical Physics



## Solid State & Materials Physics



## Medical Physics



**Biophysics & Biomedical Physics:** The faculty of the Biophysics & Biomedical Physics cluster in our department is engaged in a wide range of basic and applied research projects. Research interests include the molecular organization of collagen, lipid rafts in biological membranes, the formation of Alzheimer plaques, the role of cellular ion pumps in wound healing, carbon nanotubes as biological detectors, optical imaging of neuronal activity, three-dimensional imaging of intact tissues, motility of cancer cells, and the optical detection of pathogens in water.

**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.

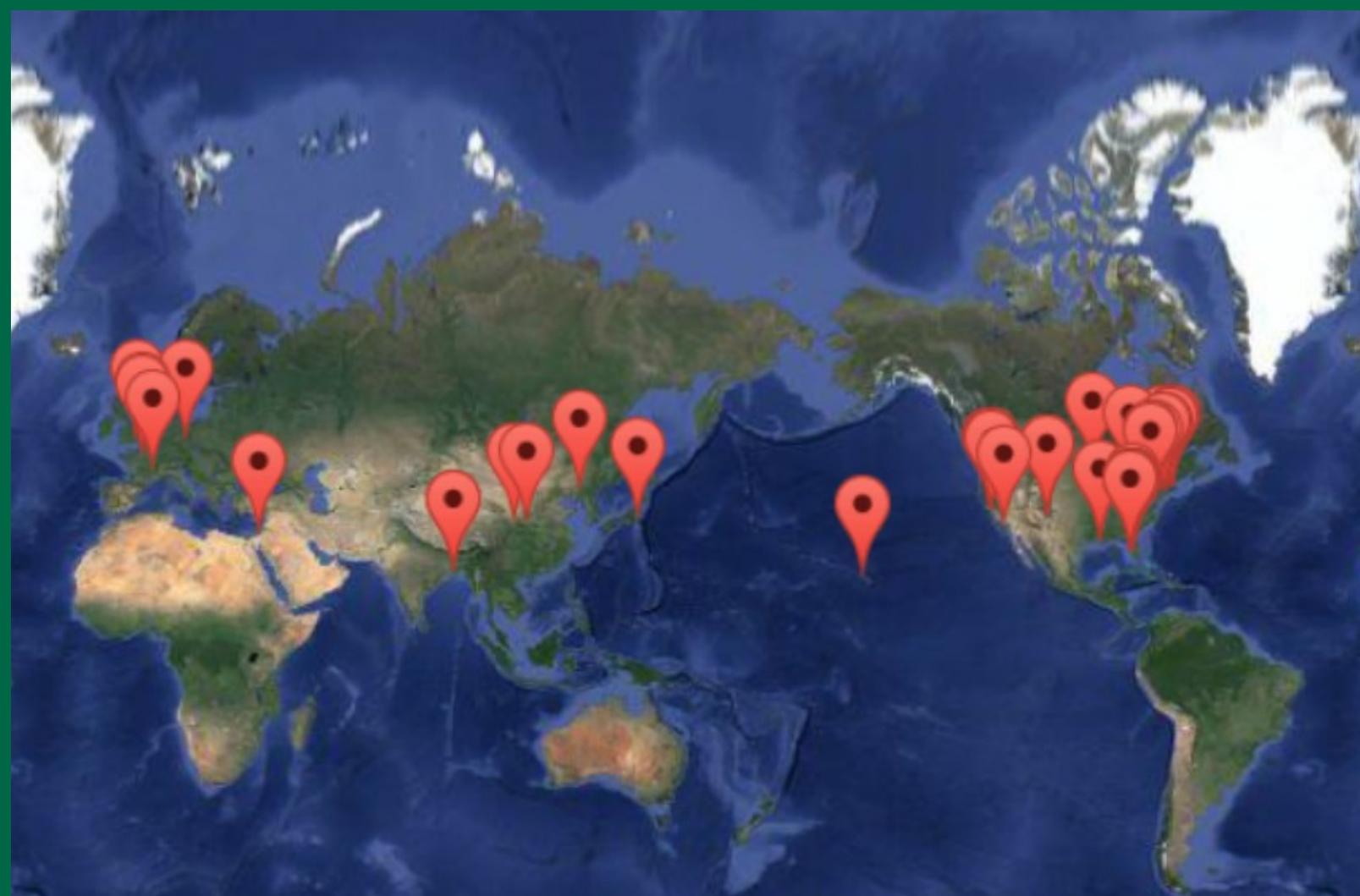
**Solid State & Materials Physics:** Basic and applied research in Solid-state and Materials Physics at the University of South Florida aims to improve the understanding of physical phenomena and to develop advanced materials and processes for technologically significant applications. The range of topical areas of interest include carbon nanotubes, heterostructures, magnetic semiconductors, magnetic nanostructures, multiferroics, nanocomposites, novel semiconductors and intermetallics, quasicrystals, quantum dots, oxides, organic electronic materials, energetic materials, polymers, and colloids.

**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.

# Special Feature: Industrial Practicum

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



## Student Organizations

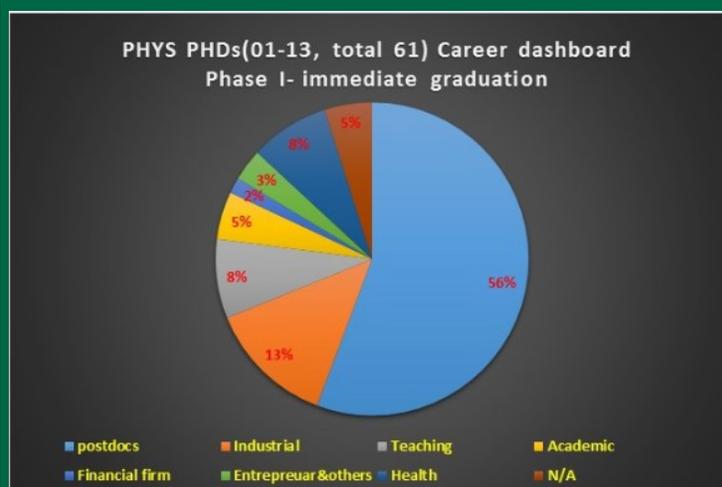
Graduate students are active in the life of the department—some might say that they are the life of the department—through the Physics Graduate Student Committee and the Society of Physics Students. USF grad students organized the Tampa-Orlando chapter of APS local links, a forum sponsored by the American 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.

## Graduation Placement

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



## The Department of Physics at the University of South Florida

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For further inquiry about Admission, please contact:  
Prof. Inna Ponomareva, Director of Graduate  
Admissions, at [phyadmissions@usf.edu](mailto:phyadmissions@usf.edu)

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