

# Horacio Carias

**Languages Spoken:** English – fluent  
Spanish – advanced

**Education:** University of Central Florida  
Overall GPA: 3.64  
Bachelor of Science in Chemistry, May 2006  
Chemistry GPA: 3.63  
Bachelor of Science in Physics, May 2006  
Physics GPA: 3.75

**Standardized Tests:** GRE Testing 8/17/2005  
Verbal 750/800 99<sup>th</sup> percentile  
Quantitative 790/800 90<sup>th</sup> percentile

## Research Experience

**Duke University** Summer 2007-Present  
**Department of Chemistry**  
**Theoretical Chemistry**  
**Advisor: Prof. David Beratan**

- Discrete optimization in chemical space for the design of high affinity ligands for the androgen and estrogen receptors.
- Theoretical analysis of inelastic electron tunneling in molecular systems.
- Computational simulation of inelastic electron tunneling dynamics.

**University of Central Florida** Summer 2005-Summer 2006  
**College of Optics and Photonics**  
**Nanophotonics Lab**  
**Advisor: Prof. Pieter Kik**

- Computer modeling and engineering of plasmonic structures that exhibit zero group velocity at optical frequencies.
- Fabrication and analysis of plasmonic materials.

- Design and construction of prism coupling apparatus

**University of Central Florida Department of Chemistry** Summer 2004-Summer 2005

**Nanophotonic Materials Lab**

**Advisor: Prof. Florencio Hernandez**

- Initially sponsored by the NSF REU program at the College of Optics.
- Designed and synthesized organic, organic-inorganic hybrids and noble metal nanomaterials for optical and electrical applications.
- Successfully constructed silver nanosandwiches.
- Soft condensed matter and rheology.

**University of Central Florida Department of Chemistry** Spring 2002-Spring 2004

**Medicinal Chemistry Lab**

**Advisor: Prof. Otto Phanstiel IV**

- Research included organic synthesis and characterization, fluorescence microscopy and managing a cell culture lab.
- Worked on various synthetic methods for the construction of aziridine rings.
- Studied the uptake of fluorescently labeled chemotherapeutics in melanoma cells.
- Partially funded by a summer research fellowship from the American Cancer Society.

**Teaching Experience**

**Duke University Department of Physics** Fall 2006-Present

**Head Teaching Assistant for PHY 62 (Intro Electric, Magnet, Optics)**

**Teaching Assistant for PHY 53 (General Physics I)**

**The Princeton Review** Summer 2005-Present

**General Chemistry and Physics Instructor**

**University of Central Florida** Summer 2004-Present

## **Physics Tutor - Electromagnetism**

**University of Central Florida**

Fall 2001-Present

**Chemistry Tutor – General, Organic and Physical**

## **Academic Honors & Awards**

**Duke GPNano Fellowship** (Spring 2007, Spring 2008)

**Honorable Mention, NSF Graduate Research Fellowship** (Spring 2006)

**Offered UCF Trustees Doctoral Fellowship** (\$25,000 per annum) – Most generous graduate fellowship offered by UCF. Offered for graduate study in optics. College of optics offered a further \$7,000 per annum in addition to the \$18,000 offered by the school. (Spring 2006)

**Offered Deans Fellowship at Rice University** (\$24,000 per annum) – Most generous graduate fellowship offered by Rice University. Offered by the college of electrical and computer engineering for graduate study in applied physics. (Spring 2006)

**Nominated for the Barry M. Goldwater Scholarship** – One of four UCF undergraduates nominated for the Goldwater scholarship. (Spring 2005)

**American Chemical Society Award for Outstanding Achievements in the Chemical Sciences** – Awarded to undergraduates for previous achievements in the chemical sciences. (Summer 2004)

**AAAS award** – American Association for the Advancement of Science award for the best undergraduate presentation at the 2004 meeting of the Florida Academy of Sciences. (Spring 2004)

**American Cancer Society Summer Research Fellowship** – ACS sponsored summer research program. (Summer 2003)

**Roger L. Von Amelunxen Scholarship** – One-year academic scholarship awarded to

U.S. Customs employees or their families. (2002-2003)

**UCF Scholars award** – Scholarship awarded to UCF undergraduates, based on academic performance and financial need. (2002-2003, 2003-2004, did not meet financial need limits from 2004-2006)

**American Chemical Society Award for Outstanding Achievements in High School Chemistry** – Awarded to high school students for achievements in chemistry.

(Summer 2001)

### **Presentations**

#### **Development of Nanomaterials for Negative Refraction**

REU poster session at the College of Optics and Center for Research and Education in Optics and Lasers at the University of Central Florida, July 23 2004, Orlando, FL.

#### **Differential Uptake of Fluorescent Polyamine Conjugates into Melanoma Cells**

80<sup>th</sup> FAME, Florida Annual Meeting of the American Chemical Society, Clarion Hotel and Conference Center at Orlando International Airport, May 6 2004, Orlando, FL.

2004 SURE meeting, Showcase of Undergraduate Research Excellence at the University of Central Florida, April 9 2004, Orlando, FL.

68<sup>th</sup> Annual Meeting of the Florida Academy of Sciences, March 13, 2004, University of Central Florida, Orlando, FL.

### **Publications**

Carias, H.; Marquez, M.; Hernandez, F.; A Wet Chemistry Method for the Preparation of Silver Nanosandwiches. *J. Nanosci. Nanotechnol.* **2007**, *7*, 2331-2334.

Wang, C.; Delcros, J.-G.; Cannon, L.; Konate, F.; Carias, H.; Biggerstaff, J.; Gardner, R.; Phanstiel, O. Defining the molecular requirements for the selective delivery of

polyamine-conjugates into cells containing active polyamine transporters. *J. Med. Chem.* **2003**, *46*, 5129-5138.