

# Enrique Alberto Segura Carrillo

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## CONTACT INFORMATION

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## EDUCATION

California State University, Los Angeles, Los Angeles, California June 2021  
M.S. Physics

University of California, Los Angeles, Los Angeles, California June 2017  
B.S. Physics

## FELLOWSHIPS & AWARDS

Larry Chu Scholarship July 2020  
Graduate Equity Fellowship June 2020  
NIH MBRS-RISE MS-to-PhD Fellowship June 2020  
Sally Casanova Scholar May 2020  
SLAC Alonzo W. Ashley Research Fellowship November 2017

## PUBLICATIONS

Mc Goldrick, Ciarán, Mark Matney, Enrique Segura, Youngtae Noh, and Mario Gerla (2015). “WaterCom: A Multi-level, Multipurpose Underwater Communications Test Platform”. In: *Proceedings of the 10th International Conference on Underwater Networks & Systems*. WUWNET '15. Arlington, VA, USA: ACM, 14:1–14:8. ISBN: 978-1-4503-4036-6. DOI: [10.1145/2831296.2831336](https://doi.org/10.1145/2831296.2831336). URL: <http://doi.acm.org/10.1145/2831296.2831336>.

Mc Goldrick, Ciarán, Enrique Segura, Tianyan Wu, and Mario Gerla (2016). “WaterCom: Connecting Research Configurations with Practical Deployments: A Multilevel, Multipurpose Underwater Communications Test Platform”. In: *Proceedings of the 11th ACM International Conference on Underwater Networks & Systems*. WUWNet '16. Shanghai, China: ACM, 8:1–8:2. ISBN: 978-1-4503-4637-5. DOI: [10.1145/2999504.3001118](https://doi.org/10.1145/2999504.3001118). URL: <http://doi.acm.org/10.1145/2999504.3001118>.

## RESEARCH

*Microelectronics Intern Researcher* June 2020 - September 2020  
The Aerospace Corporation, El Segundo, CA

- Will develop simulations of physical devices under radiation effects for space applications, implement physics-based model using Silvaco TCAD, and perform electrical characterization of microelectronic devices to test model's accuracy.

*Graduate Student Researcher* January 2020 - Present  
California State University, Los Angeles, Los Angeles CA

- Working on experiment automation of Keithley nanovoltmeters, probes and oscilloscopes using LabView and Python to implement a feedback controller to measure spin to spin relaxation time using NMR techniques.

*Visiting Researcher* November 2018 - November 2019  
UCLA Network Research Laboratory, Los Angeles, CA

- Developed implementation of a Quantum Neural Network (QNN) to study the near term gate quantum computer model using Google's Cirq.
- Tested QNN on a toy-model representing a Stern-Gerlach device under bit-flipping and on 2D Ising model with transverse field.
- Designed a pedagogical colab notebook as a tutorial showcasing this implementation.

*Science and Engineering Associate I* November 2017 - November 2018  
SLAC National Accelerator Laboratory, Menlo Park, CA

- Developed Physical Optics Propagation simulations of a Gaussian beam and a flat-top beam propagated on a laser transport comprised of a series of telescopes and mirrors under random perturbations using ZEMAX.
- Created numerical model to predict effects of thermal changes in a laser system intended for Plasma Wake-field Particle acceleration.

- Developed an algorithm by using the detected changes in laser position across the transport, the numerical model, and a PID-controller to stabilize the laser system.
- Designed and built a two-mirrors-two-CCDs system with pico-motors to characterize the effects of hysteresis in the algorithm's performance.
- Applied image processing using template matching and low-pass filters to recognize, differentiate, and track the intended laser spot across the laser system.
- Algorithm stabilize the effects of thermal fluctuations by a factor of 40 in 24-hour period.
- Algorithm's feedback enables experiments to run 24/7, dramatically improving from the previous thermally-imposed experimental time-window of 10 pm - 8 am.
- Algorithm's control allows uninterrupted experimental runs removing the need for a time-consuming manual alignment every 30 minutes.
- Presented project's results to LCLS team at SLAC to showcase its potential as a suitable feedback method for LCLS's beamline.

#### *Undergraduate Researcher*

Summer 2015 - Summer 2017

UCLA Network Research Laboratory, Los Angeles, CA

- Developed web infrastructure to remotely schedule experiments.
- Prepared embedded hardware for experiments by developing parallel compilation of NRL's MPTCP Linux Kernel on Raspberry Pis.
- Executed data acquisition of vehicular and underwater wireless experiments.
- Implemented data analysis of experimental data to quantify network traffic trade-offs between TCP vs MPTCP.

#### **ADDITIONAL TRAINING**

Princeton Plasma Physics Laboratory Graduate Summer School

Summer 2019

SLAC Summer Institute

Summer 2018

SLAC Machine Learning Applications for Particle Accelerators Mini-Workshop

Spring 2018

#### **POSTER**

Segura Carrillo, Enrique (2019). *Mitigating Slow-Drift Effects for Plasma Wakefield Particle Acceleration*. Princeton, NJ, USA: Princeton Plasma Physics Laboratory Graduate Summer School.

#### **TEACHING**

*Graduate Assistant*

Fall 2019

California State University, Los Angeles, Los Angeles, CA

- Supported laboratory physics course focused on experimental debugging to teach physics concepts.

*CSL Fellow*

Fall 2016, Winter 2019

Hispanic Heritage Foundation, Washington, D.C.

- Developed computer science fundamentals course at Telfair Elementary using Scratch during Winter 2019.
- Provided programming fundamentals workshop at San Fernando High School Magnet's AP Computer Science course using Java during Fall 2016.

*Computer Science Instructor*

Summer 2017

SMASH Academy, University of California, Los Angeles

- Developed computer science fundamentals course on Python for gifted high school students.

*Computer Science Instructor*

Spring 2017

ACM TEACH LA, UCLA Lab School, Los Angeles, CA

- Co-lead on a computer science course for gifted fifth graders at UCLA Lab School using Python.

#### **SKILLS**

Python, LabVIEW, MATLAB, Linux, Raspberry Pi 3, Arduino, Fortran, Zemax, Cirq, Qiskit, Mathematica.