

# Lars Prospero Tatum

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<http://www.scholars.ufl.edu/Lars-Tatum.aspx>

## EDUCATION

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**Bachelor of Science** in Electrical Engineering, *Univ. of Florida Honors College* **May 2019**

- Minor in Physics
- Major GPA: 4.00
- UF GPA: 3.97

**Associate of Arts** with Highest Honors, *Hillsborough Community College*, **May 2016**

- Graduated concurrently with High School through the Dual Enrollment Program
- GPA: 4.00

**High School Diploma**, *Middleton High School*, June 2016

- Completed the Project Lead the Way Engineering Magnet Program.

**Relevant Coursework:** Electronic Circuits, VLSI I, Resonant MEMS, Solid State Electronic Devices, Quantum Mechanics I, Realtime Digital Signal Processing, Microprocessor Applications, Electromagnetics, Enriched Modern Physics, Digital Logic, Intro to Computer Science

## HONORS AND AWARDS

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**John W. & Mittie Collins Scholarship** from the University of Florida College of Engineering, Spring 2017

**Dean's List Appointee** from the University of Florida College of Engineering, Spring 2017

**HKN Inductee** from Eta Kappa Nu, the Electrical and Comp. Engineering Honors Society, April 2017

**University Scholars Program Member** from the UF Center for Undergraduate Research, March 2017

**AP + PLTW Achievement in Engineering** from College Board and PLTW, December 2016

**President's Honor Roll** from the University of Florida, Fall 2016.

**Dean's List Appointee** from the University of Florida College of Engineering, Fall 2016

**Florida Academic Scholarship** from Florida Bright Futures Scholarship Program, 2016 – 2020

**National AP Scholar** from the CollegeBoard, 2016

**PRIME Educational Grant** from the Society of Manufacturing Engineers, 2016

**Control Award, State Qualifier** from FIRST Robotics, 2016

**MathMovesU Scholarship** from Raytheon, 2014

## **RESEARCH EXPERIENCE**

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**UF Interdisciplinary Microsystem Group, Undergraduate Research Assistant**      **January 2017 - Present**

- Magnetics Group: Design and fabrication of Electropermanent magnet systems (EPMs).
- Optimized design geometry, materials, and fabrication techniques.
- Characterized designs to evaluate performance.
- Developed and tested magnetic field control and test circuitry for experimental apparatus.
- Fall 2017: Synthesis and optical simulation of high frequency electro-optical modulator.

**UF SWAMP Group, Undergraduate Research Assistant**      **August 2017 - Present**

- Group focus: Software Analysis and Advanced Materials Processing
- Optimizing a multi-band approach for the simulation of carrier radiation effects in degenerate compound semiconductors to increase simulation accuracy and decrease convergence issues.

**National Inst. of Standards and Tech, Guest Researcher**      **May 2017 - August 2017**

- Selected to participate in the 2017 Summer Undergraduate Research Fellowship program.
- Worked in the Center for Nanoscale Science and Technology (CNST) NanoLab.
- Project: “Towards a Scanning Probe Diamond NV Center Nanoscale Magnetometer”
- Developed, assembled, and characterized “homebuilt” atomic force microscopy sensing system to scan a diamond nitrogen-vacancy center across nanostructures for thermometry and magnetometry capabilities.

## **PROFESSIONAL EXPERIENCE**

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**University of Florida, Electronic Circuits Teaching Assistant**      **January 2018 – May 2018**

- Tutor and assistant students with course material
- Oversee and assist students with lab experiments
- Grade students’ homework, laboratory reports

**Out of the Box Media Consultants Oldsmar, FL, Technical Support**      **May 2017-Present**

- On-call IT support- assist with windows based systems, social media setup, and network troubleshooting.

**LJT Lawn Services, Tampa, FL, Owner & Operator**      **May 2011 –August 2016**

- Secured various landscaping jobs in neighborhoods. Serviced up to 5 clients per week.
- Performed accounting, marketing, customer relations, and maintenance. Gained experience using QuickBooks, Microsoft Excel, and Publisher for accounting and marketing.

- Lars' Rockin' Guitar Lessons**, Tampa, FL, *Instructor* **August 2014 – May 2015**
- Facilitated the development of middle schoolers' guitar skills from the beginner level.
  - Synthesized interactive and rewarding lessons to get students engaged in the content.
  - Organized small "showcases" for each student to highlight their achievements.

## ENGINEERING EXPERIENCE

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- UF Eta Kappa Nu**, *Curriculum Chair* **January 2017 – Present**
- Met and exceeded requirements for induction into Eta Kappa Nu (HKN), the Electrical and Computer Engineering Honors Society in Spring 2017.
  - Brainstorming and implementing ways to improve UF's ECE curriculum.
  - Led HKN's "Insider's Guide" ECE curriculum project.
  - Leading project to further develop freshman electrical engineering design course
  - Tutoring peers in HKN-sponsored review sessions and other study groups.
  - Organized and lectured for Electronics crash course seminars

- Women in Electrical and Comp Eng. (WECE)**, *Member* **September 2016 – Present**
- Attend meetings, technical workshops, and tech talks.
  - Help promote the success of women in Electrical and Computer Engineering
  - Make use of and help run the WECE Maker Garage to foster the innovative spirit at UF.

- FIRST Robotics- Team Maelstrom**, Tampa, FL, *Systems Lead* **August 2014 – May 2016**
- Led a team of 10 to implement multiple robotic systems to improve performance in the field.
  - Integrated conveyor, feed, suspension, and safety systems that allowed our team to advance to the regional tournament in Texas and break the world record score. Operated the robot under high stress tournament situations.
  - Wrote code in Java for the robot.

## INVOLVEMENT

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- University of Florida Crew**, *Rower* **September 2016 – September 2017**
- Rigorous daily 6am practice. Disciplined to follow rowing commands, handle expensive equipment, and work together as a team to achieve goals set forth. Compete in regattas (races) nationally.
  - Highlights: 1<sup>st</sup> place, *FIRA*, 1<sup>st</sup> place, *Duel in the Swamp*, 3<sup>rd</sup> place, *John Hunter Regatta*, 4<sup>th</sup> place, *SIRA*, 4<sup>th</sup> place, *Head of the Hooch*

- Farewell to Goodbye Band**, Tampa, FL, *Songwriter/Guitarist* **January 2011 – August 2016**

- Led songwriting process, wrote close to 20 songs in 3 releases. Directed practices and writing sessions.
- Performed over 100+ gigs, including opening for national bands with audiences ranging from 20 to 20,000.

## **PRESENTATIONS**

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### **Towards a Scanning Probe Diamond NV Center Nanoscale Magnetometer**

*National Institute of Standards and Technology SURF Student Colloquium, August 2017*

Developed a sensing system for use in a scanning probe instrument to image nanomagnetism via a nitrogen-vacancy center defect in diamond. In the project, I had to create a method to hold an NV center defect in an optical microscope's focal spot, sense surface forces, keep it a fixed distance from the surface, reliably scan the surface, and create an image that tells us about the surface's properties. Begun constructing the instrument by designing, testing, and assembling a quartz tuning fork cantilever on a printed circuit board.

### **Team Chargers: Athlete Mobile Battery Solution**

*Middleton High School EDD Symposium, May 2016*

As a team, we researched and developed a solution for a commonly faced problem as a part of the PLTW capstone class, Engineering Design and Development. After conducting market research and analysis, we chose to pursue mobile battery solutions for athletes. Using design tools such as Autodesk Inventor and AutoCAD, we developed a novel armband charger for mobile devices. We built a prototype of our design and presented our work at the EDD Symposium at the end of the school year to Tampa Bay area engineers, business critics, investors, and more.

## **PUBLICATIONS**

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[1] C. Velez, L. P. Tatum, B. Herstein, C. P. Becker and D. P. Arnold, "Batch-fabrication and characterization of miniaturized axisymmetric electropermanent magnets," in *17th international conference on micro and nanotechnology for power generation and energy conversion applications (PowerMEMS)*, 2017, pp. 206-210.

## **OVERVIEW OF SPECIALIZED SKILLS**

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**Software Programs:** LTSpice, Altium, Cadence, Code Composer Studio, Atmel Studio, Quartus II, NI Labview, Multisim, Autodesk Inventor, AutoCAD, QuickBooks, MS Office Suite, Citrix Remote Apps, FLOOX

**Programming Languages:** Matlab, tcl, Assembly, Embedded C, C++, VHDL, Java, Python, G-Code

**Foreign Languages:** English (native), Spanish (intermediate)

**Development/Design Skills:**

Microcontrollers: Design with Altera MAX V CPLD, Atmel XMEGA, TI MSP-432, and Arduino Uno.

Fabrication: Experience with laser cutting, soldering, oscilloscopes, wire-wrapping, protoboard development, microfabrication, micrometers, spincoating. Operation of band saws, drill presses, CNC Mill, pulse magnetizer.

Imaging: Vibrating Sample Magnetometer, Magneto-Optical Indicator Film, Atomic Force Microscopy

**OTHER RESEARCH INTERESTS**: MEMS, Quantum Systems, Electronic Circuits, Neuromorphic Computing